Indexed with IndMED
Indexed with MedIND
Indian Citation Index (ICI)

ISSN 0971-0876
RNI 50798/1990
University Grants Commission 20737/15554

IJCP
A Medical Communications Group
www.ijcpgroup.com

Indian JOURNAL of CLINICAL PRACTICE

A Multispecialty Journal

Volume 31, Number 3 August 2020, Pages 201–300 **Single Copy Rs. 300/-**

Peer Reviewed Journal

In this issue

• Original Research
• Original Article
• Review Article
• Clinical Study
• Case Report
• Medicolegal
• Medical Voice for Policy Change
• Around the Globe
• Spiritual Update
• Inspirational Story
• Lighter Reading

Group Editor-in-Chief
Dr KK Aggarwal

Full text online: http://ebook.ijcpgroup.com/ijcp/
IJCP Publications | https://goo.gl/j2nXQQ

www.emedinexus.com

HealthPlus
Diagnostic & Imaging Centre

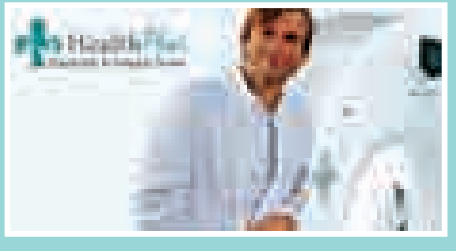
One Stop for All Diagnostics

MRI

- Latest MRI by Siemens
- Ultra Short Magnet = No Claustrophobia
- 1st MRI in India on VC 15 Platform

CT Scan

- 16- Multislice Spiral CT
- Safest Scanner
- Least Radiation Dose



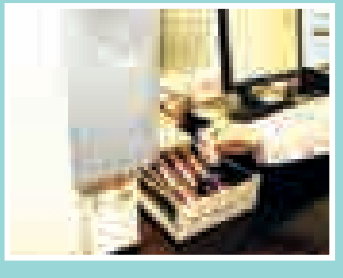
Health Packages

- Executive Health Check Up
- Risk Categories
- Age Based Health Packages

Fully Automated Digital Pathology Laboratory - NABL Accredited

Immunology

Biochemistry



Haematology

Special Tests

Contact Us

S-63 Greater Kailash Part 1
Opposite M Block Market, New Delhi 110048
Tel.: 011- 41234567

This journal is indexed in IndMED (http://indmed.nic.in) and full-text of articles are included in medIND databases (http://mednic.in) hosted by National Informatics Centre, New Delhi.

Indian JOURNAL of CLINICAL PRACTICE
A Multispecialty Journal
Volume 31, Number 3, August 2020

FROM THE DESK OF THE GROUP EDITOR-IN-CHIEF

205 **CDC Updated Guidance does not Imply Immunity to Reinfection**
KK Aggarwal

ORIGINAL RESEARCH

206 **A Descriptive Study to Assess the Knowledge About Facts and Prevailing Myths Regarding COVID-19 in General Public**
Anjali Singh, Sonia Singh

ORIGINAL ARTICLE

212 **India's Testing Strategy for COVID-19 – An Epidemiological Perspective**
Nidhi Bhatnagar, Suneela Garg, Ekta Arora, MM Singh

218 **A Study of Methicillin-resistant *Staphylococcus aureus* Infections**
Mohd Javed, Mahesh Kumar, M Uwais Ashraf, Harris M Khan

REVIEW ARTICLE

224 **TURP Syndrome – A Quick Review and Update**
Parinita C Hazarika

CLINICAL STUDY

230 **One-Step versus Two-Step Diagnostic Test for Gestational Diabetes Mellitus**
Sukriti Gupta, Shashi Bala Arya, Rashmi Ramanuj Prasad, Tariq Mahmood, JK Goel

237 **Effectiveness of Counseling in the Management of Infertile Patients Undergoing Treatment with Assisted Reproductive Technologies**
Sunita Chandra, Suhani Chandra

242 **Fascia Iliaca Compartment Block in the Emergency Room in Hip Fracture and Shaft of Femur Fractures**
Aditya Chandramohan, Padmaprakash Gandhiraj, Abdul Khader, Jude Vinoth

246 **Gender-related Difference in Socioeconomic and Behavioral Factor in Relation to BP and BMI of Type 2 Diabetic Workers from Match Factories and Fireworks in Sivakasi, Tamil Nadu**
V Priya, Mazher Sultana, Babuji, Kamaraj

CASE REPORT

256 **Sinus Venosus Atrial Septal Defect with Hemianomalous Right Upper Pulmonary Venous Drainage in Holt-Oram Syndrome**
Pradeep Kumar Radhakrishnan, Gayathri Ananyajyothi Ambat, Roshini Ambat, Nihas Nazer, Arun Vijaya Kumar, Murugan S, YA Nazer

Published, Printed and Edited by
Dr KK Aggarwal, on behalf of
IJCP Publications Ltd. and
Published at
E - 219, Greater Kailash Part - 1
New Delhi - 110 048
E-mail: editorial@ijcp.com

Printed at
New Edge Communications Pvt. Ltd., New Delhi
E-mail: edgecommunication@gmail.com

Editorial Policies

The purpose of IJCP Academy of CME is to serve the medical profession and provide print continuing medical education as a part of their social commitment. The information and opinions presented in IJCP group publications reect` the views of the authors, not those of the journal, unless so stated. Advertising is accepted only if judged to be in harmony with the purpose of the journal; however, IJCP group reserves the right to reject any advertising at its sole discretion. Neither acceptance nor rejection constitutes an endorsement by IJCP group of a particular policy, product or procedure. We believe that readers need to be aware of any or relationship (employment, consultancies, stock ownership, honoraria, etc.) between an author and any organization or entit` that has a irect` interest in the subject matter or materials the author is writing about. We inform the reader of any pertinent relationships disclosed. A disclosure statement, where appropriate, is published at the end of the relevant article.

Note: Indian Journal of Clinical Practice does not guarantee, directly or indirectly, the quality or efficac of an` product or serice` described in the advertisements or other material which is commercial in nature in this issue.

258 Disseminated Trichosporonosis Presenting with Acute Emphysematous Pyelonephritis in Severely Comorbid Patient
Jay V Chaudhari

262 An Isolated Conjunctival Capillary Hemangioma Masquerading as Ocular Surface Squamous Neoplasia
Ashok Rathi, RS Chauhan, JP Chugh, Vandana Sharma, Gautam Jain

266 Autoimmune Hemolytic Anemia – An Interesting Case Report
V Padma, B Abhilash Nair

270 Unilateral Atresia of Cervix Uteri and Uterus Didelphys in a Girl with Operated Congenital Pouch Colon
Sangeeta Gupta, Taru Gupta, Akshay Sharma, Pushpa Bhatia, Nupur Gupta

274 Body Dysmorphic Disorder – Borderline Category Between Neurosis and Psychosis
K Raman, R Ponnudurai, OS Ravindran

MEDICOLEGAL

278 An MBBS Doctor Admits a Patient Under Him and a Specialist Visits the Patient 1 or 2 Times. But, the Patient does not Change the File Name or Transfers the Case. Is This Correct or Incorrect?
KK Aggarwal, Ira Gupta

MEDICAL VOICE FOR POLICY CHANGE

279 Medtalks with Dr KK Aggarwal

AROUND THE GLOBE

285 News and Views

SPIRITUAL UPDATE

291 Soul does not Leave the Body Immediately After the Death
KK Aggarwal

INSPIRATIONAL STORY

292 Life is All About Choices

LIGHTER READING

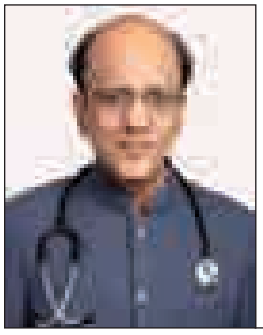
294 Lighter Side of Medicine

IJCP's EDITORIAL & BUSINESS OFFICES

Delhi	Mumbai	Bangalore	Chennai	Hyderabad
Dr Veena Aggarwal 9811036687 E - 219, Greater Kailash, Part - I, New Delhi - 110 048 Cont.: 011-40587513 editorial@ijcp.com drveenaijcp@gmail.com **Subscription** Dinesh: 9891272006 subscribe@ijcp.com	Mr Nilesh Aggarwal 9818421222 Unit No: 210, 2nd Floor, Shreepal Complex Suren Road, Near Cine Magic Cinema Andheri (East) Mumbai - 400 093 nilesh.ijcp@gmail.com	H Chandrashekar **GM Sales & Marketing** 9845232974 11, 2nd Cross, Nanjappa Garden Doddaiah Layout Babusapalya Kalyananagar Post Bangalore - 560 043 chandra@ijcp.com	Chitra Mohan **GM Sales & Marketing** 9841213823 40A, Ganapathypuram Main Road Radhanagar, Chromepet Chennai - 600 044 Cont.: 22650144 chitra@ijcp.com	Venugopal **GM Sales & Marketing** 9849083558 H. No. 16-2-751/A/70 First Floor Karan Bagh Gaddiannaram Dil Sukh Nagar Hyderabad - 500 059 venu@ijcp.com

GM: General Manager

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020



Dr KK Aggarwal
President, CMAAO and HCFI
Past National President, IMA
Group Editor-in-Chief, IJCP Group

CDC Updated Guidance does not Imply Immunity to Reinfection

People who are infected with coronavirus disease 2019 (COVID-19) do not necessarily have immunity to reinfection for 3 months, said CDC.

It is possible that people may continue to test positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) for up to 3 months following diagnosis and not transmit the infection to others. But, this does not imply that infection confers immunity for that period.

The confusion had emanated from an August 3 update to CDC's isolation guidance. The guidance stated the following:

"Who requires quarantine?

People who have been in close contact with someone who has COVID-19 – excluding people who have had COVID-19 within the past 3 months.

People who have tested positive for COVID-19 do not need to quarantine or get tested again for up to 3 months as long as they do not develop symptoms again. People who develop symptoms again within 3 months of their first bout of COVID-19 may need to be tested again, if there is no other cause identified for their symptoms."

One may read these statements as suggesting that those who are recovering from COVID-19 would possibly be protected from reinfection for 3 months even with close exposure to infected people. Media reports took this as the agency is implying immunity.

However, a new statement from the CDC has condemned the media for misinterpreting its guidance. According to CDC, the guidance was about retesting, and not immunity.

The latest data indicate that retesting in the 3 months following initial infection is not required unless the person develops the symptoms of COVID-19 and the symptoms cannot be tied to another illness.

The CDC went on to update and state categorically that it is not known if someone can be reinfected with COVID-19. According to the CDC, individuals who were previously infected with COVID-19 may continue to have low levels of virus in their body for up to 3 months; hence, the positive test results even if they recovered from the virus.

The CDC, thus concluded that the duration of infection in the majority of patients is no more than 10 days following symptom onset, and no more than 20 days in those with severe illness or in severely immunocompromised individuals.

The agency also stated that there are no confirmed reports of reinfection within 3 months of initial infection.

The guidance recommends that if patients recovering from COVID-19 come in contact with a positive case and have new symptoms, they should isolate themselves, contact their healthcare provider and possibly undergo retesting. All the people, including those recovering from the infection, should follow the recommended interventions, including social distancing, wearing a face mask in public and washing of hands.

The CDC restated that people testing positive for COVID-19 should isolate for at least 10 days following symptom onset and until 24 hours after the fever subsides without the use of antipyretic medications.

(Source: Medpage Today)

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

A Descriptive Study to Assess the Knowledge About Facts and Prevailing Myths Regarding COVID-19 in General Public

ANJALI SINGH*, SONIA SINGH†

ABSTRACT

Objective: To assess the knowledge about coronavirus disease 2019 (COVID-19) among the population. To assess the prevailing myths regarding COVID-19. **Methodology:** This survey with descriptive design was conducted on 117 residents of Ghaziabad, to assess the facts about COVID-19 as well as prevailing myths regarding COVID-19. A structured questionnaire was used to conduct the survey. Participants participated actively in this research. **Result:** Data was analyzed using descriptive statistics. Out of 117 respondents, 82 were males and 35 were females. Out of 117 subjects, 71.65% had correct knowledge of COVID-19, and 28.35% did not have the correct knowledge regarding the disease. Myths were not prevalent among the study subjects. **Conclusion:** The study showed that most people had correct knowledge about the facts of COVID-19. Myths were not prevalent.

Keywords: Novel coronavirus, pandemic, quarantine, outbreak, myths and facts

The coronavirus disease 2019 (COVID-19) pandemic is an alarming condition, which has rapidly spread across the world. A global pandemic is really life-threatening. Also, people find it difficult to adjust with a sudden occurrence of an outbreak. While the world is searching for solutions to overcome this pandemic, it is important for us to have correct knowledge regarding facts and dispel prevailing myths about this pandemic. When headlines start carrying the word "pandemic", people start becoming fearful, and fear is linked with misinformation and rumors, leading to myths in the population at large and among certain groups e.g., eating garlic helps prevent infection from novel coronavirus. The fact is that garlic is a healthy food that may have some antimicrobial properties. However, there is no evidence from the current outbreak that eating garlic prevents new coronavirus infection. Spraying alcohol or chlorine all over the body kills the new coronavirus is another myth that is prevalent. The fact is that spraying alcohol or chlorine all over the body will not kill viruses that have already entered the body. According to World Health Organization (WHO), there are elevated rates of myths, due to quarantine and lockdown in affected areas. The number of COVID-19 cases continue to climb every day across the world, including in India. Thus, the researcher felt the need to assess the knowledge about facts and prevailing myths regarding COVID-19.

OBJECTIVES

- To assess the knowledge of COVID-19 among the population.
- To assess the prevailing myths regarding COVID-19
- To know the impact of prevailing myths on general public regarding COVID-19

METHODOLOGY

"Research design" is the overall plan for obtaining answers to the question being studied and for handling some of the difficulties encountered during the research. This descriptive survey design was conducted on residents of Ghaziabad, to assess facts and prevailing myths about the disease. This survey with descriptive design was conducted on 117 persons using a structured questionnaire.

*BSc Nursing
†Assistant Professor, Psychiatric Nursing
Galgotias University, Greater Noida, Uttar Pradesh
Address for correspondence
Anjali Singh
BSc Nursing
Galgotias University, Greater Noida, Uttar Pradesh

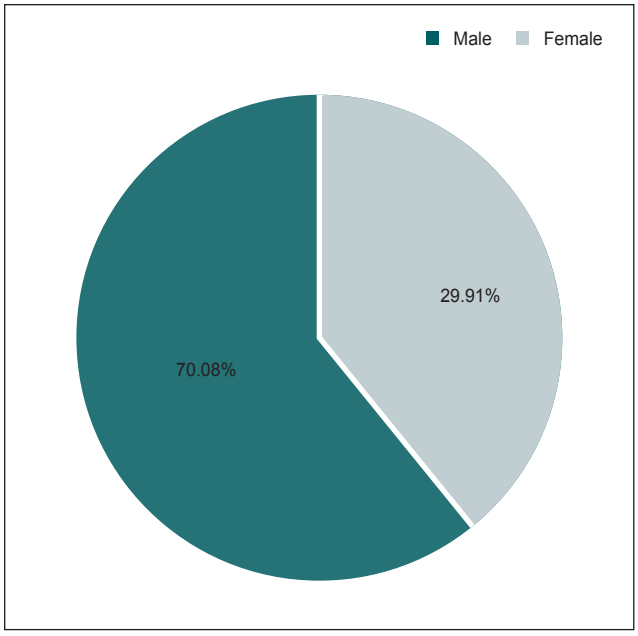


Figure 1. Percentage of males and females who have actively participated in the research.

RESULTS

Data was analyzed using descriptive statistics and interpreted to assess the knowledge of myths and facts regarding COVID-19.

To begin with, the data were entered in the Google forms in the form of questions for statistical processing.

Respondents have actively participated in the research study and have shown their interest in answering the questions on myths and facts regarding COVID-19. There are total 117 respondents.

Out of 117 respondents, 82 (70.08%) were males and 35 (29.91%) were females (Fig. 1).

Table 1 shows the percentage of the participants who have participated in the research. A total of 117 participants participated in the survey. The average of right answers is 14.

DISCUSSION

To the best of our knowledge, there is no published study, which has evaluated the knowledge about facts and prevailing myths regarding COVID-19 in general public. COVID-19 is an alarming disease, which has affected the individuals around the world. It has affected the lifestyle of the individuals. There have been several deaths and large numbers of affected cases of the COVID-19 all around the world. Every day thousands of new cases are being reported.

Table 1. Percentage of the Participants Who have Participated in the Research

Survey question no.	Right answer (%)	Wrong answer (%)	Respondents out of 117
Q 1.	68.4 (n = 80)	31.6 (n = 37)	117
Q 2.	79.1 (n = 91)	20.9 (n = 24)	115
Q 3.	64.9 (n = 74)	35.1 (n = 40)	114
Q 4.	85.3 (n = 99)	14.7 (n = 17)	116
Q 5.	79.5 (n = 93)	20.5 (n = 24)	117
Q 6.	28.2 (n = 33)	71.8 (n = 84)	117
Q 7.	79.1 (n = 91)	20.9 (n = 24)	115
Q 8.	47.9 (n = 56)	52.1 (n = 61)	117
Q 9.	63.2 (n = 74)	36.8 (n = 43)	117
Q 10.	90.4 (n = 103)	9.6 (n = 11)	114
Q 11.	82.9 (n = 97)	17.1 (n = 20)	117
Q 12.	88.9 (n = 104)	11.1 (n = 13)	117
Q 13.	65.8 (n = 77)	34.2 (n = 40)	117
Q 14.	79.5 (n = 93)	20.5 (n = 24)	117
Q 15	100 (n = 117)	0 (n = 0)	117
Average	73.54 (n = 86)	26.46 (n = 31)	116.214

The condition is worsening day by day. This global pandemic has affected the individuals mentally as well, which can lead to many myths and generate panic, stress or anxiety, etc. The study is done in view of the alarming increase in the myths about the disease among the general public. The WHO information has been used in awareness and reducing the stigma-related to COVID-19 among general public.

CONCLUSION

COVID-19 is an alarming disease these days. It was first identified in Wuhan city of China in 2019. It is the most discussed disease as its vaccine is not discovered yet.

The study showed that most people had correct knowledge about Coronavirus pandemic. All the respondents were from the urban areas. Myths were not prevalent among population of Ghaziabad surveyed.

Acknowledgment

We would like to thank all the study participants for their voluntary participation.

SUGGESTED READING

1. Cennimo DJ. Coronavirus Disease 2019 (COVID-19) Questions & Answers. Available at: https://emedicine.medscape.com/article/2500114-questions-and-answers.
2. Knvul Sheikh, Roni Caryn Rabin. The coronavirus: what scientists have learned so far. June 1, 2020. Available at: https://www.nytimes.com/article/what-is-coronavirus.html.
3. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med. 2020;382(8):727-33.
4. WHO. WHO Director-General's Opening Remarks at the Media Briefing on COVID-19; March 11, 2020. Available from: https://www.who.int/dg/speeches/detail/whodirectorgeneral-s-opening-remarks-at-the-mediabriefing-on-covid-19-11-march-2020.
5. World Health Organization. (2020). Clinical management of COVID-19: interim guidance, 27 May 2020. World Health Organization. Available at: https://apps.who.int/iris/handle/10665/332196.
6. National Institutes of Health, Coronavirus disease 2019 (COVID 19) treatment guidelines. 2020.
7. World Health Organization. (2020). Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations: scientific brief, 29 March 2020. World Health Organization. Available at: https://apps.who.int/iris/handle/10665/331616

ANNEXURE

Demographic Variable (Part A)

1 Age:
   a. 6 8
   b. 9 2
   c. 2 and above

2. Gender:
   a. Male
   b. Female

3. Type of family:
   a. Joint family
   b. Nuclear family

4 Number of siblings:
   a. 1
   b. 2
   c. 3

5. Knowledge regarding facts and prevailing myths on COVID-9
   a. Family Friends
   b. Television
   c. Newspaper
   d. Social media

Self-Structured Questionnaire (Part B)

1. Can regularly rinsing your nose with saline water help prevent infection with new coronavirus?
   a. Yes
   b. No

2 Can an ultraviolet disinfection lamp kill the new coronavirus?
   a. Yes
   b. No

3 Can spraying alcohol and chlorine all over body kill the new coronavirus?
   a. Yes
   b. No

4 Can pets at home spread the new coronavirus?
   a. Yes
   b. No

5 Do vaccines against pneumonia protect you against the new coronavirus?
   a. Yes
   b. No

6. Is it safe to receive a letter from China?
   a. Yes
   b. No

7. Are hand dryers effective in killing the new coronavirus?
   a. Yes
   b. No

8 Can gargling with warm water protect you from infection with new coronavirus?
   a. Yes
   b. No

9 Can eating garlic help you prevent infection from new coronavirus?
   a. Yes
   b. No

10. Does putting sesame oil block the new coronavirus?
   a. Yes
   b. No

1 Can holding breath for 0 seconds help you prevent coronavirus?
   a. Yes
   b. No

2 Can drinking alcohol protect you from the new coronavirus?
   a. True
   b. False

13. Can taking a hot water bath protect you from the new coronavirus?
    a. True
    b. False
14. From where do you come to know the above stated myths?
    a. Newspaper
    b. Television
    c. Social media
    d. Family friends
15. Can you tell that the new coronavirus affects which age group of population?
    a. Infants
    b. Younger
    c. Older
    d. All age group

■■■■

Povidone-iodine has Proven Efficacy Against SARS-CoV-2

As of August 5, 2020 close to 19 million people have been infected with SARS-CoV-2 the virus that causes COVID-19.[1]

Respiratory droplets and physical contact from contaminated surfaces are the primary sources of transmission of the SARS-CoV-2 virus. Therefore, adequate hand hygiene and oral decontamination appear to be pivotal to prevent the spread of the virus, besides other measures, such as wearing a mask and maintaining physical distance.

Povidone-iodine (PVP-I) has long been known for its antimicrobial potential. PVP-I is there on the WHO List of Essential Medicines. Besides that, PVP-I mouthwash is a part of the WHO R&D blueprint for experimental treatment options against COVID-19.

A study by Anderson et al[2] recently assessed the virucidal activity of four PVP-I products against SARS-CoV-2 at an exposure time of 30 seconds. The four products included an antiseptic solution, a skin cleanser, gargle and mouthwash and a throat spray. All the products were found to attain ≥99.99% virucidal activity against the virus, which corresponded to ≥4 $\log_{10}$ reduction of virus titer, within a contact time of 30 seconds. The findings validate the rapid virucidal activity of PVP-I against the virus that has wreaked havoc across the globe.

Current guidelines, in relation to COVID-19 such as those from the Australian Dental Association and the US CDC, also recommend the use of a pre-procedural mouthwash such as a PVP-I mouthwash.[3,4]

PVP-I products have a potential role in infection prevention owing to their broad-spectrum antimicrobial and rapid virucidal activities.

References

1. Available at: https://www.worldometers.info/coronavirus/. Accessed August 5, 2020.
2. Anderson DE, Sivalingam V, Kang AEZ, et al. Povidone-iodine demonstrates rapid in vitro virucidal activity against SARS-CoV-2, the virus causing COVID-19 disease. Infect Dis Ther. 2020;1-7.
3. Australian Dental Association. Managing COVID-19 Guidelines. Available at: https://www.ada.org.au/Covid-19-Portal/Files/pdf/ADA-Managing-COVID-19-Guide-25-March-2020.aspx. Accessed August 6, 2020.
4. Centers for Disease Control and Prevention. Guidance for Dental Settings: Interim Infection Prevention and Control Guidance for Dental Settings During the Coronavirus Disease 2019 (COVID-19) Pandemic. Available at: https://www.cdc.gov/coronavirus/2019-ncov/hcp/dental-settings.html. Accessed August 6, 2020.

Real is Rare

in the management of anemia

℞ **DEXORANGE®**

Syrup/Capsules/Paediatric Syrup

(Ferric Ammonium Citrate)

The Masterpiece in Hematinics

℞ In Anemia associated with

- Pregnancy & Lactation
- General Weakness
- Menorrhagia
- Chemotherapy Induced Anemia
- Nutritional & Iron deficiency
- Lack of Appetite
- Chronic Gastrointestinal Blood Loss
- Chronic Kidney Disease

FRANCO-INDIAN
PHARMACEUTICALS PVT. LTD.
20, Dr. E. Moses Road, Mumbai 400 011.

2020

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

India's Testing Strategy for COVID-19 – An Epidemiological Perspective

NIDHI BHATNAGAR*, SUNEELA GARG†, EKTA ARORA‡, MM SINGH#

ABSTRACT

India has responded to the current pandemic of coronavirus disease 2019 (COVID-19) in terms of systems development, capacity building, upgrading infrastructure along with highest political support, including implementation of testing for COVID-19 as per Indian Council of Medical Research (ICMR) guidelines. However, the strategy, which was earlier restricted due to several reasons has now been gradually scaled up and modified as per requirements of the country. The paper attempts to evaluate the testing strategies in place with an epidemiological perspective. Newer testing modalities of feces, saliva and radiological testing hold promising evidence and need validation for effective utilization. India must deploy the tests in hand rationally for the control of pandemic. Testing for COVID-19 must address resurgence of local outbreaks currently, provide immunity certificates and intelligence on epidemic evolution in long-term.

Keywords: India, COVID-19, Testing strategy

India has responded to the current pandemic of coronavirus disease 2019 (COVID-19) in terms of systems development, capacity building, upgrading infrastructure along with highest political support including implementation of testing for COVID-19 as per Indian Council of Medical Research (ICMR) guidelines.[1]

In the first phase of the epidemic, India attempted intensive screening of travelers, strict surveillance and contact tracing of imported cases. These measures were initiated with first travel restriction implemented/imposed for travel to China on 26th February 2020 and thereafter, from 2nd March 2020 advisories restricted movement of passengers from COVID-19-affected countries. Government closed entry for all international travelers to contain the spread of COVID-19 by 22nd March, 2020.[2] This was done with an intention to focus on the second stage of control wherein control measures will be targeted to active case finding and contact tracing within Indian subcontinent. The country went for total lockdown across all states on 24th March 2020 to prevent further spread of pandemic and prepare for the upcoming surge of cases. With rise in number of active cases to 25,007 and 1,147 deaths as on 1st May, 2020, country focused on the cluster containment strategy and measures that need to be adopted to exit lockdown, simultaneously preventing any surge of cases. The rapid surge in cases was; however, noticed in the following months thereafter with variation in numbers across states. As on 11th August, number of active cases reached to 6,39,929 with 45,257 deaths.[3]

India's response to the pandemic has been timely, tough and strategic, considering the pressures from the economic front.[4] Testing strategy of the country evolved as the pandemic progressed keeping in view the epidemiological measures, available logistics for testing and the warranted response. The strategy, which was earlier restricted due to several reasons was gradually scaled up as per requirements of the country. Appropriate testing strategy is essential to control the pandemic and optimally utilize the available resources.

The current paper attempts to study the evolution of testing strategy in Indian context with an epidemiological perspective.[5]

*Assistant Professor
†National President Elect, Indian Association of Preventive and Social Medicine
Director Professor
‡Senior Resident
#Director Professor
Dept. of Community Medicine, Maulana Azad Medical College, New Delhi
Address for correspondence
Dr Ekta Arora
Senior Resident
Dept. of Community Medicine, Maulana Azad Medical College, New Delhi
E-mail: aroraekta09@gmail.com

TESTING FOR DIAGNOSIS

Right testing strategy is essential for rapid containment of outbreak and optimal utilization of resources. Under the aegis of ICMR, laboratory expansion is an ongoing process. ICMR is engaging with several non-ICMR, Ministry of Health & Family Welfare (MoHFW), Government laboratories and private labs to initiate testing facilities for COVID-19. As on 1st July, 2020, there were 1,049 labs - 761 Government and 288 Private laboratories.[6] Real-time reverse transcriptase polymerase chain reaction (RT-PCR) for COVID-19 is being done in 557 labs, TrueNat Test for COVID-19 is being done in 363 labs and CBNAAT Test for COVID-19 in 80 labs. To meet the surge in cases, diagnostic capacity is being strengthened by making optimum use of qRT-PCR and nucleic acid amplification test (NAAT)-based machines available with the Multidisciplinary Research Units (MRUs), National AIDS Control Organization (NACO) and National Tuberculosis Elimination Program (NTEP).[7] This has enabled country's daily testing capacity to scale up significantly to more than 5,00,000 tests/day. Mechanisms have been set up to ensure that central monitoring and reporting of all tests being done is conducted. An RT-PCR app has been introduced by ICMR which is used to generate SIRF (Specimen Referral Form) number for every test being performed. This SIRF number along with mobile contact is important for entering the test in the ICMR portal and is an essential pre-requisite by the ICMR for approved testing centers.

All eligible individuals are being offered tests at no cost in Government labs and at capped prices in private labs as per the recent directive of Supreme Court of India. Kits and assays used in the country are US Food and Drug Administration (FDA) approved or have undergone validation at the Apex laboratories of the country. Specimen collection and testing protocols follow the World Health Organization (WHO) guidelines and recommendations.

Currently, two types of tests are available for diagnosis of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in India. RT-PCR assay of sample identifies people currently infected by testing for the presence of novel coronavirus. It is a quantitative assay; however, not being used in routine viral load assessment. It can identify the cases early and help in isolation and cluster containment. The test is time consuming (4-5 hours) with specific expertise and precautions required in sample collection and testing. The sensitivity varies with the type of sample increasing from oropharyngeal, nasopharyngeal to sputum and maximum with bronchoalveolar lavage (BAL). Sensitivity of RT-PCR, as reported by Wang et al varied, at 93% for BAL, 72% for sputum, 63% for nasal swabs and only 32% for throat swabs.[8] Pharyngeal RT-PCR tests for COVID-19 have a sensitivity and specificity of 82% and 98%, respectively.[9] Sampling of BAL is possible only for critical patients admitted with severe acute respiratory illness (SARI), leaving behind only the pharyngeal samples to be tested for RT-PCR.

A novel Rapid point of care antigen test from a South Korean firm (Rapid antigen test kits) is a safe, rapid chromatographic immunoassay for qualitative detection of specific antigens to SARS-CoV-2 at various levels. The test has a very high specificity ranging from 97% to 100%. Sensitivity of the test ranges from 63% to 84% in independent evaluations, based on the viral load of the patient. Higher viral load correlated with higher sensitivity.[10] To increase the testing capacity, it is recommended by ICMR to use rapid antigen tests as first-line tests, where RT-PCR is not available. Those positive are considered positive and managed accordingly. Those negative, if symptomatic with influenza-like illness (ILI) and strong exposure history, are advised for RT-PCR testing. If completely asymptomatic with insignificant exposure history, they can be considered negative, e.g., not suffering from the disease. Low level of re-testing with RT-PCR in those who are testing antigen negative with strong clinical suspicion will underestimate the cases and not give the true picture of the outbreak.[11]

Interpreting COVID-19 tests for diagnosis needs to be done with caution. Considering that the pretest probability may vary from the disease prevalence significantly, we cannot assume that the post-test probability or chances of acquiring the disease may remain same. Thus, the test result, positive or negative, must be analyzed keeping in view the exposure and symptomatic history of the individual (which in turn decides the pre-test probability). With knowledge of disease still in infancy and many lacunas remaining, it is difficult to give estimates of the same. The decision must be taken on case-to-case basis while interpreting the diagnostic test.[12]

WHO calls to isolate, test and treat intensively to break the chains of COVID-19 transmission.[13] Testing protocol in India underwent modifications to ensure that epidemiological strategies, disease surveillance and economic concerns are addressed. The country's testing capacity as on March 31 was nearly 5,500 tests/day crossing the capacity of 1 lakh/day in May,[14] 2 lakh/day by June end and 7 lakh/day by August.

S No.	Date	Testing Strategy	Rationale
1	17th March, 2020	.` Symptomatic people (fever` co. gh, difficulty in breathing, etc.) with history of international travel in the last 14 days. 2. Symptomatic in close contact with COVID laboratory confirmed cases.	To check for cases in people with travel history to affected countries and their contacts.
2	20th March, 2020	1. All symptomatic healthcare workers 2. All hospitalized patients with severe acute respiratory infection 3. Asymptomatic direct and high-risk contacts of confirmed case on Day 5 and Day 14 of contact.	1. Prevent nosocomial transmission of disease. 2. SARI surveillance done as a part of sentinel surveillance to understand the trend of disease across states in India. Also, it is marker for community transmission. 3. Asymptomatic contacts tested to further prevent community transmission.
3	9th April, 2020	Strategy for cluster containment: All symptomatic influenza-like illnesses (ILIs) to be tested with PCR assay within 7 days of illness and antibody test after 7 days of illness. It also advises the conduct of RT-PCR in cases with negative antibody tests when suspicion to suffer from SARS-CoV-2 is high. All asymptomatic direct contacts to be tested with RT-PCR between Day 5 and 14.	Ensure that effective cluster containment is done with mass testing for all people with ILI. Both RT-PCR and rapid antigen kits must be deployed for rapid results with accuracy.
4	18th May, 2020	Following additions were done in the testing strategy: 1. All symptomatic (ILI symptoms) individuals with history of international travel in the last 14 days. 2. All hospitalized patients who develop ILI symptoms. 3. All symptomatic ILI among returnees and migrants within 7 days of illness. 4. No emergency procedure (including deliveries) should be delayed for lack of test.	The required revisions were done to ensure that the internal migration and nosocomial transmission does not add to the disease burden of COVID-19 cases.
5	23rd June, 2020	Newer testing strategies introduced were expanded at country level e.g.,True-NAAT, CBNAAT, Rapid point of care Antigen tests.	Expansion of testing capacity to the labs at the level of district hospitals and at field level.
6	1st July, 2020	Test treat and track strategy emphasized: Testing capacity boosted and the process made simpler to ensure all individuals fitting into the criteria being tested with prescriptions from any Registered Medical Practitioner. Expansion of point of care rapid antigen tests for diagnosis in containment zones and in hospitals.	

TESTING STRATEGY FOR SURVEILLANCE

- Sentinel surveillance on SARI was initiated by ICMR across country. SARI testing for COVID-19 was the only testing strategy valid pan India, with reliable estimates and interstate comparisons. This is because with the advancement of pandemic and simultaneous shortage of logistics, adherence to ICMR criterion for testing varied across states at various stages of pandemic.[15]
- Pooled testing has been advocated to reduce the cost of screening large number of individuals for infectious diseases in disease locations across stages with low prevalence. If the pool tests negative, all individuals within it are diagnosed as negative. If the pool tests positive, retesting is required to identify the positive individuals.[16] In COVID-19 pandemic, pooled testing is permitted in areas with low prevalence of COVID-19 (low positivity of <2% from the existing data). In areas with positivity of 2-5%, sample pooling for PCR screening may be considered in community survey or surveillance among asymptomatic individuals.[17]

- Antibody test, using Rapid diagnostic kits, detect the host's immune response to the virus. An indigenous IgG ELISA test (COVID KAWACH) for antibody detection for SARS-CoV-2 was developed with sensitivity and specificity of 98.7% and 100%, respectively.[18] This was a rapid test with larger one-time processing of samples. Additionally, it is possible to do ELISA-based testing at district level as the ELISA kit has inactivated virus and it requires minimal biosafety and biosecurity. IgG ELISA and CLIA tests are recommended only for sero-surveys and survey in high-risk vulnerable population (healthcare workers, frontline workers, immunocompromised individuals, individuals in containment ø nes, etc) to ascertain the proportion of people who have been infected in the past and have now recovered.

  Serial sero-surveys have been initiated across the country to know the prevalence of infection in the community. This will estimate and monitor the trend of infection in the adult population, ascertain the socio-demographic risk factors and outline the spread of the infection from a geographical viewpoint. Recent sero-surveys have been conducted by ICMR which found the past exposure of infection in ‰ of the population. Risk in urban areas and urban slums was and times higher than rural areas, respectively.[19] Delhi sero-prevalence study by National Centre for Disease Control (NCDC) on samples collected across Delhi found IgG antibodies in ‰ of the population. The study also found that majority of the infected persons remained asymptomatic.[20] Sero-surveillance study conducted in an urban slum of Dharavi found % of surveyed people in the slums of Dahisar, Chembur and Matunga to have antibodies in blood.[21]

  The utiliat ion of these tests is limited to criterions laid down by ICMR. It needs to be specified that they cannot be used for diagnosis of past infection of COVID- for the general population. The test has been advocated after days of symptom onset when the level of antibody in blood peaks. Thereafter, it is shown to decline considerably with many studies reporting absence after 2 months from the days of onset of symptoms. Levels of antibody have been correlated with severity of disease with their presence in asymptomatics under research.[22]

TESTING STRATEGY FOR DISCHARGE

Revised discharge policy of the country, under the guidance of W O, does not recommend testing for mild-to-moderate cases of COVID- The patient can be discharged after days of symptom onset and no fever for 3 days for mild cases. For moderate cases, if the fever resolves within 3 days and the patient maintains saturation above % for the next 4 days (without oxygen support), such patient will be discharged after days of symptom. For severe COVID- cases, a negative RT-PCR test is warranted along with resolution of symptoms.[23]

NEWER TESTING OPTIONS FOR COVID-19

In a retrospective study conducted by Bernheim et al in China, findings of chest computed tomography (CT) in relation to time between symptom onset and initial CT scan was reviewed for symptomatic patients infected with COVID- Bilateral, peripheral ground-glass and consolidative pulmonary opacities were the hallmark findings. Majority of early patients had a normal CT whereas; however, as the time elapsed, more frequent CT findings like consolidation, total lung involvement, linear opacities, "crazy-paving" pattern and the f‘ everse halo" signs were observed.[24]

In a case series by Fang et al, the sensitivity of chest CT was observed to be greater than that of RT-PCR (‰ vs. % , respectively, p < . Immature development of nucleic acid detection technique, low viral load or inadequate clinical sampling can be the probable reasons for the low efficiency of viral nucleic acid detection.[25] It has also been observed that patients who underwent both chest CT and RT-PCR tests, the sensitivity of chest CT in detecting COVID-19 was % , based on positive RT-PCR results. However, in patients with negative RT-PCR results, positive chest CT findings were evident in 75%.[26]

TESTING OF FECES AND SALIVA

SARS-CoV-2 is shed through multiple routes and testing of feces and saliva are being evaluated by several companies with kits for the same. However, there is a need to validate the results as currently studies have been conducted on small samples and results cannot be generaliæd . Persistent shedding of virus in feces is documented for a period of 5 weeks in adults and more than 4 weeks in children after the nasopharyngeal swabs turn negative.[27,28] The results of nCoV nucleic acid test of several biological samples during the treatment of confirmed COVID- shows positivity in feces to be ‰ .[29] Fecal PCR testing was stated to be as accurate as respiratory sample PCR detection with fecal PCR becoming positive, 2 5 days later than sputum

PCR positive result in 6–9% cases.[30] Fecal testing for SARS-CoV-2 may be important from the aspect of environment surveillance and sewage sampling may be utilized indirectly to assess the circulation of virus in the community.

Salivary testing for COVID-19 has been advocated as being convenient, noninvasive and safe for patients as well as healthcare providers.[31] There has been documented evidence of saliva collected through coughing out as the most appropriate strategy for SARS-CoV-2 isolation.[32] Saliva has a high consistency rate of around 90% with nasopharyngeal specimens to detect respiratory viruses, including coronaviruses, and the presence of virus is reported in high titers.[33] Saliva has also been used in screening respiratory viruses among hospitalized patients without pyrexia or respiratory symptoms. In a study by Azar et al, salivary testing has been advocated to be a reliable tool to detect SARS-CoV-2 [34] Another study demonstrated that despite having low sensitivity, saliva testing may be a suitable alternative first-line screening test in low resource settings.[35]

CONCLUSION

Rational and sound testing should form the basis of COVID-19 prevention and control. Testing strategy must be geographically tailored, pruned as per the COVID-19 statistics and epidemiological measures for disease control. Aggressive early testing allow for early identification of cases to allow for timely targeted isolation and social distancing measures. Moreover, in developing tropical countries, reports of false-positive tests for dengue have been informed in patients later diagnosed of COVID-19. Testing data with hospitalizations and mortality statistics can be surrogate markers of disease impact. Aggregated test results at community and state levels should support disease-surveillance system for moderating the stringency of infection prevention and control measures.[36]

Mass testing in countries alone cannot result in stemming or delaying the peak of COVID-19 outbreak. Right testing strategy as per WHO recommended standards with test, treat and track strategy will result in controlling the pandemic. India must deploy tests in hand rationally for the control of pandemic. Newer testing modalities like testing saliva, fecal samples and radiological imaging must be evaluated and systems established for the same. Testing for COVID-19 has multipronged outcomes, eg, curbing the resurgence of local outbreaks, identifying people who have developed immunity and can return to work and obtaining information on how the epidemic is evolving, including information on when a threshold for herd immunity has been reached.

REFERENCES

1. Indian Council of Medical Research, New Delhi [Internet]. [cited 2020 Jul 12]. Available from: https://www.icmr.gov.in/
2. Advisory: Travel and Visa Restrictions Related to COVID-19 [Internet]. [cited 2020 Aug 19]. Available from: https://boi.gov.in/content/advisory-travel-and-visa-restrictions-related-covid-19-1
3. Staff S. Covid-19: Maharashtra reports biggest single-day surge with 6,330 infections, but active cases fall [Internet]. Scroll.in. https://scroll.in; [cited 2020 Jul 15]. Available from: https://scroll.in/latest/966246/coronavirus-donald-trump-says-hes-all-for-masks-as-us-reports-a-record-52000-cases-in-a-day
4. MoHFW | Home [Internet]. [cited 2020 Jun 22]. Available from: https://www.mohfw.gov.in/
5. Dixon-Woods M, Cavers D, Agarwal S, Annandale E, Arthur A, Harvey J, et al. Conducting a critical interpretive synthesis of the literature on access to healthcare by vulnerable groups. BMC Med Res Methodol. 2006; 6(1):35.
6. Many states are restricting COVID-19 testing, insisting on prescription only by govt doctors: Centre [Internet]. The New Indian Express. [cited 2020 Jul 15]. Available from: https://www.newindianexpress.com/nation/2020/jul/02/many-states-are-restricting-covid-19-testing-insisting-on-prescription-only-by-govt-doctors-centre-2164093.html
7. Gupta N, Bhatnagar T, Rade K, Murhekar M, Gangakhedkar RR, Nagar A; ICMR COVID Team. Strategic planning to augment the testing capacity for COVID-19 in India. Indian J Med Res. 2020;151(2 & 3):210-5.
8. Wang W, Xu Y, Gao R, Lu R, Han K, Wu G, et al. Detection of SARS-CoV-2 in different types of clinical specimens. JAMA. 2020;323(18):1843-4.
9. Jiang G, Ren X, Liu Y, Chen H, Liu W, Guo Z, et al. Application and optimization of RT-PCR in diagnosis of SARS-CoV-2 infection. medRxiv. 2020 Feb 28;2020.02.25.20027755.
10. ICMR recommends use of rapid antigen kits for testing in containment zones, healthcare settings. The Economic Times [Internet]. 2020 Jun 15 [cited 2020 Aug 19]; Available from: https://economictimes.indiatimes.com/industry/healthcare/biotech/healthcare/icmr-recommends-use-of-rapid-antigen-kits-for-testing-in-containment-zones-healthcare-settings/articleshow/76384822.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst
11. Koshy J, Babu NM. Fewer COVID-19 re-tests mar Delhi's testing strategy. The Hindu [Internet]. 2020 Jul 17 [cited 2020 Aug 10]; Available from: https://www.thehindu.com/

news/cities/Delhi/fewer-covid-19-re-tests-mar-delhis-testing-strategy/article32115082.ece

12. Watson J, Whiting PF, Brush JE. Interpreting a covid-19 test result. BMJ [Internet]. 2020 May 12 [cited 2020 Aug 19];369. Available from: https://www.bmj.com/content/369/bmj.m1808
13. World Health Organization. (2020). Laboratory testing strategy recommendations for COVID-19: interim guidance, 21 March 2020. World Health Organization. Available from: https://apps.who.int/iris/handle/10665/331509
14. Coronavirus | India increases testing capacity to 1 lakh a day. The Hindu [Internet]. 2020 May 14 [cited 2020 Jul 15]; Available from: https://www.thehindu.com/news/national/coronavirus-india-increases-testing-capacity-to-1-lakh-a-day/article31577961.ece
15. Gupta N, Praharaj I, Bhatnagar T, Vivian Thangaraj JW, Giri S, Chauhan H, et al. Severe acute respiratory illness surveillance for coronavirus disease 2019, India, 2020. Indian J Med Res. 2020;151(2 & 3):236-40.
16. Bilder CR, Tebbs JM. Pooled-testing procedures for screening high volume clinical specimens in heterogeneous populations. Stat Med. 2012;31(27):3261-8.
17. Perappadan BS. Coronavirus | ICMR suggests using pooled samples for molecular testing. The Hindu [Internet]. 2020 Apr 14 [cited 2020 Jul 15]. Available from: https://www.thehindu.com/sci-tech/health/covid-19-icmr-suggests-using-pooled-samples-for-molecular-testing/article31337482.ece
18. Pulla P. COVID-19: Are the ICMR Antibody Kits really as accurate as it claims? [Internet]. The Wire Science. 2020 [cited 2020 Jul 15]. Available from: https://science.thewire.in/the-sciences/covid-19-icmr-antibody-kit-elisa-kavach-specificity-sensitivity/
19. Delhi June 11 SSN, June 11 2020 Updated: Ist 2020 23:03. ICMR releases sero-survey results, says no community transmission yet but large population at risk of Covid-19 [Internet]. India Today. [cited 2020 Aug 10]. Available from: https://www.indiatoday.in/india/story/icmr-sero-survey-community-transmission-high-risk-coronavirus-india-population-hotspot-containment-zones-1688045-2020-06-11
20. Over 23% Delhi residents have COVID-19 antibodies, shows sero-survey data; NCDC says 77% still susceptible - Health News, Firstpost [Internet]. Firstpost. 2020 [cited 2020 Aug 10]. Available from: https://www.firstpost.com/health/over-23-delhi-residents-have-covid-19-antibodies-shows-sero-survey-data-ncdc-says-77-still-susceptible-8624511.html
21. Altstedter A. Mumbai serological survey results show its slums could be reaching herd immunity for Covid [Internet]. ThePrint. 2020 [cited 2020 Aug 10]. Available from: https://theprint.in/health/mumbai-serological-survey-results-show-its-slums-could-be-reaching-herd-immunity-for-covid/470623/
22. Long QX, Liu BZ, Deng HJ, Wu GC, Deng K, Chen YK, et al. Antibody responses to SARS-CoV-2 in patients with COVID-19. Nat Med. 2020;26(6):845-8.
23. Govt revises discharge rules for Covid-19 patients: All you need to know [Internet]. [cited 2020 Jul 15]. Available from: https://www.livemint.com/news/india/govt-revises-discharge-rules-for-covid-19-patients-all-you-need-to-know-11589018417202.html
24. Bernheim A, Mei X, Huang M, Yang Y, Fayad ZA, Zhang N, et al. Chest CT findings in coronavirus disease-19 (COVID-19): Relationship to duration of infection. Radiology. 2020;295(3):200463.
25. Fang Y, Zhang H, Xie J, Lin M, Ying L, Pang P, et al. Sensitivity of chest CT for COVID-19: Comparison to RT-PCR. Radiology. 2020;200432.
26. CT provides best diagnosis for COVID-19 [Internet]. ScienceDaily. [cited 2020 Jul 15]. Available from: https://www.sciencedaily.com/releases/2020/02/200226151951.htm
27. Xu Y, Li X, Zhu B, Liang H, Fang C, Gong Y, et al. Characteristics of pediatric SARS-CoV-2 infection and potential evidence for persistent fecal viral shedding. Nat Med. 2020;26(4):502-5.
28. Xing YH, Ni W, Wu Q, Li WJ, Li GJ, Wang WD, et al. Prolonged viral shedding in feces of pediatric patients with coronavirus disease 2019. J Microbiol Immunol Infect. 2020;53(3):473-80.
29. Wu J, Liu J, Li S, Peng Z, Xiao Z, Wang X, et al. Detection and analysis of nucleic acid in various biological samples of COVID-19 patients. Travel Med Infect Dis. 2020;101673.
30. Tian Y, Rong L, Nian W, He Y. Review article: gastrointestinal features in COVID-19 and the possibility of faecal transmission. Aliment Pharmacol Ther. 2020;51(9):843-51.
31. Sri Santosh T, Parmar R, Anand H, Srikanth K, Saritha M. A review of salivary diagnostics and its potential implication in detection of Covid-19. Cureus. 2020;12(4):e7708.
32. Xu R, Cui B, Duan X, Zhang P, Zhou X, Yuan Q. Saliva: potential diagnostic value and transmission of 2019-nCoV. Int J Oral Sci. 2020;12(1):1-6.
33. Kim YG, Yun SG, Kim MY, Park K, Cho CH, Yoon SY, et al. Comparison between saliva and nasopharyngeal swab specimens for detection of respiratory viruses by multiplex reverse transcription-PCR. J Clin Microbiol. 2017;55(1):226-33.
34. Azzi L, Carcano G, Gianfagna F, Grossi P, Gasperina DD, Genoni A, et al. Saliva is a reliable tool to detect SARS-CoV-2. J Infect. 2020;81(1):e45-50.
35. Williams E, Bond K, Zhang B, Putland M, Williamson DA. Saliva as a noninvasive specimen for detection of SARS-CoV-2. J Clin Microbiol. 2020;58(8):e00776-20.
36. Studdert DM, Hall MA. Disease Control, Civil Liberties, and Mass Testing - Calibrating restrictions during the Covid-19 pandemic. N Engl J Med. 2020;383(2):102-4.

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

A Study of Methicillin-resistant *Staphylococcus aureus* Infections

MOHD JAVED*, MAHESH KUMAR†, M UWAIS ASHRAF‡, HARRIS M KHAN#

ABSTRACT

Background: *Staphylococcus aureus* is a major cause of nosocomial infections including pneumonia, postoperative wound infection, bacteremia and other infections. A major cause of concern in the treatment of *S. aureus* infections is the emergence of methicillin-resistant *Staphylococcus aureus* (MRSA), which was reported just 1 year after the launch of methicilin. The current study was undertaken to determine the prevalence of infection caused by *S. aureus* in hospitalized and outdoor patients and to determine the prevalence of MRSA isolated from different clinical samples as well as to characterize the patients with MRSA on the basis of risk factors. **Material and methods:** The present study was conducted in the Dept. of Microbiology of a tertiary care hospital, from August 2009 to August 2011. Various clinical specimens such as pus, blood, urine cerebrospinal fluid (CSF), pleural fluid, peritoneal fluid, ascitic fluid, bile, cervical swab, semen, conjunctival swabs and ear swabs received in the Microbiology laboratory were studied. Culture was done on 4% NaCI Mueller-Hinton agar. Carriers showing MRSA were prescribed mupirocin/chlorhexidine for treatment. Further culture was done on 5-10% sheep blood agar, Mc-Conkey Agar, Mannitol salt agar and Robertson cooked meat broth. Subcultures from cooked meat broth were performed if there was no growth on primary culture plates. **Results:** The present study comprised of 262 *S. aureus* isolates from various clinical specimens. All isolates were identified as *S. aureus* on the basis of morphology, culture and biochemical characteristics. The current study shows that nearly 80% of the isolates were from the patients up to the age of 40 years and thereafter isolation rate decreased with age. Out of total 262 isolates included in the study, 154 (58.78%) isolates were from male patients and 108 (41.22%) were from female patients. Out of the 262 isolates, 204 (77.87%) were from pus. Isolates from urine samples comprised 22 (8.39%) followed by CSF 8 (3.05%), endocervical swab 7 (2.67%) and ear swab 7 (2.67%). Other samples included were seminal fluid 4(1.53%), sputum and throat swab 3 (1.15%), conjunctival swab 2 (0.76%). Foley's tip 1 (0.38%) and umbilical tip 1 (0.38%). It was observed that in 217 (82.83%) patients infection was hospital-acquired and 45 (17.17%) patients had community-acquired infection. **Conclusion:** In the present study, MRSA isolation rates from ICU and wards were higher than that seen among outpatients. The most common risk factor present in most of the patients with MRSA was prolonged stay in the hospital.

Keywords: Nosocomial infection, *S. aureus*, MRSA, hospitalized patients, outdoor patients

Staphylococcus aureus is a major cause of nosocomial infections including pneumonia, postoperative wound infection, bacteremia and other infections. A major cause of concern in the treatment of *S. aureus* infections is the emergence of methicillin-resistant *S. aureus* (MRSA), which was reported just 1 year after the the launch of methicillin. MRSA refers to any strain of *S. aureus* that has developed resistance to β-lactam antibiotics – penicillin and cephalosporins. Prolonged hospital stay, extensive antibiotic use, lack of awareness, receiving antibiotics before coming to hospital seem to be the predisposing factors of MRSA emergence.[1]

Methicillin resistance among *S. aureus* is conferred by the *mec* A gene, which encodes an altered penicillin-binding protein 2a (PBP2a). Community-acquired MRSA (CA-MRSA) differs from the nosocomial MRSA strains on the basis of its genetic backgrounds and antibiogram. CA-MRSA strains harbor the staphylococcal cassette chromosome *mec* (SCC*mec*) type IV and V element in their genome and do not have resistant markers except β-lactam and cephalosporin antibiotic.[2,3] The CA-MRSA strains are

*Research Scholar
†Associate Professor
Himalayan Garhwal University, Pauri, Himachal Pradesh
‡Assistant Professor, Dept. of Medicine
#Professor, Dept. of Microbiology
JN Medical College, AMU, Aligarh, Uttar Pradesh
Address for correspondence
Dr M Uwais Ashraf
Assistant Professor
Dept. of Medicine, JN Medical College, AMU, Aligarh, Uttar Pradesh
E-mail: uwaisashraf@gmail.com

more susceptible to antibiotics than hospital-acquired MRSA (HA-MRSA) strains.

Vancomycin has become the drug of choice for treatment of MRSA infection.[4] However, adverse side effects associated with its use and the emergence of MRSA with decreased susceptibility to vancomycin (vancomycin intermediate-resistant *S. aureus*, VISA) are leading to interest in alternative therapies for these infections.[5] Changes in the bacterial cell wall (the site of action of glycopeptides) are believed to be the key to VISA and vancomycin-resistant *S. aureus* (VRSA).[6] Emergence of vancomycin resistance in Enterococci and *in vitro* demonstration that its resistance genes (*Van* A and *Van* B) are transmitted to *S. aureus* is of great concern to the clinicians as *Van* B is supposed to be mediating vancomycin resistance. The current study was undertaken to determine the prevalence of infection caused by *S. aureus* in hospitalized and outdoor patients and to determine the prevalence of MRSA isolated from different clinical samples as well as to characterize the patients with MRSA on the basis of risk factors.

MATERIAL AND METHODS

The present study was conducted in the Dept. of Microbiology of a tertiary care hospital, from August 2009 to August 2011. Various clinical specimens such as pus, blood, urine cerebrospinal fluid (CSF), pleural fluid, peritoneal fluid, ascitic fluid, bile, cervical swab, semen, conjunctival swabs and ear swabs received in the Microbiology laboratory were studied. Culture was done on 4% NaCI Mueller-Hinton agar. Carriers showing MRSA were prescribed mupirocin/chlorhexidine for treatment. Culture was done on 5-10% sheep blood agar, Mc-Conkey Agar, Mannitol salt agar and Robertson cooked meat broth. Subcultures from cooked meat broth were performed if there was no growth on primary culture plates. The colonies of Gram-positive cocci in clusters were confirmed by using various biochemical tests like Catalase, acetoin (Voges-Proskauer, VP) production, gelatin liquefaction, phosphatase, sugar fermentation (mannitol, maltose, sucrose, trehalose), tube and slide coagulase, DNase, bacitracin sensitivity, Hugh-Leifson's (O/F) test, oxidase test (6% oxidase in DMSO reagent) and furazolidone (100 μg disk) sensitivity. Phage typing was done by the standard method described by Blair and Williams (1961) at National Staphylococcal Phage Centre, Dept. of Microbiology, Maulana Azad Medical College, New Delhi. All MRSA stains were phage-typed using 9 supplementary phages for MRSA. The 9 phages used were M3, M5, M12, M8, MR25, 622, C30, C33 and C38.

RESULTS

The present study comprised of 262 *S. aureus* isolates from various clinical specimens. All isolates were identified as *S. aureus* on the basis of morphology, culture and biochemical characteristics. The isolates were subjected to phage typing, antimicrobial susceptibility and vancomycin sensitivity. An attempt was also made to detect *mec* A gene in the methicillin-resistant isolates. In the present study, patients were divided into various age groups that varied from Day 1 to 70 years. Table 1 shows that nearly 80% of the isolates were from the patients up to the age of 40 years and thereafter isolation rate decreased with age.

Out of total 262 isolates included in the study 154 (58.78%) isolates were from male patients and 108 (41.22%) were from female patients. The male-to-female ratio was 58.78: 41.22. Table 2 shows that out of 262 isolates included in the study, 204 (77.87%) were from pus. Isolates from urine samples comprised 22 (8.39%) followed by CSF 8 (3.05%), endocervical swab 7 (2.67%), ear swab 7 (2.67%). Other samples included were seminal fluid 4 (1.53%), sputum and throat swab 3 (1.15%), conjunctival swab 2 (0.76%), Foley's tip 1 (0.38%) and umbilical tip 1 (0.38%). It was observed that in 217 (82.83%) patients infection was hospital-acquired and 45 (17.17%) patients had community-acquired infection.

Antimicrobial susceptibility screening was performed for all the 262 isolates. Fifteen antimicrobials were used for all the isolates including penicillin, erythromycin, cotrimoxazole, gentamicin linezolid, levofloxacin, chloramphenicol, ciprofloxacin and sparfloxacin.

Table 1. Isolation of *S. aureus* in Relations to Age

Age (Years)	No. of cases (%)
0-10	53 (20.23)
11-20	32 (12.21)
21-30	56 (21.37)
31-40	66 (25.19)
41-50	31 (11.83)
51-60	22 (8.39)
61-70	2 (0.78)
Total	**262 (100)**

Table 2. Isolation Rate of *S. aureus* in Relation to Specimen

Specimen	No. of isolates (%)
Pus (P)	204 (77.87)
Blood (B)	3 (1.15)
Endocervical swab (Cx)	7 (2.67)
Ear swab (E)	7 (2.67)
Urine (U)	22 (8.39)
Cerebrospinal fluid (CSF)	8 (3.05)
Conjunctival swab (Cj)	2 (0.76)
Drain tip (Dt)	0 (0.00)
Foley's tip (Ft)	1 (0.38)
Fluids (Pleural, ascitic, peritoneal)	0 (0.00)
Sputum and throat swab	3 (1.15)
Seminal fluid	4 (1.53)
Catheter tip	0 (0.00)
Umbilical tip	1 (0.38)
Total	**262 (100%)**

Antimicrobial susceptibility test results showed highest resistance to penicillin 262 (100%), followed by cotrimoxazole (89.31%), clindamycin (85.11%) and ciprofloxacin (80.91%). *S. aureus* isolates showed moderate resistance to gentamicin (69.08%), erythromycin (61.07%), amikacin (59.04%) and chloramphenicol (54.20%). Slightly low resistance was observed against quinolones, i.e., gatifloxacin (45.42%), sparfloxacin (40.08%), ofloxacin (23.66%) and levofloxacin (10.31%). Table 3 summarizes the antimicrobial susceptibility pattern for *S. aureus* in the study. Out of the total of 262 *S. aureus* isolates tested for methicillin susceptibility, 85 (32.44%) were found to be resistant to methicillin, whereas 177 (67.56%) were sensitive (Table 4). Penicillin-resistant methicillin-susceptible strains (MSSA) were considered resistant to β-lactamase labile penicillins but susceptible to other β-lactamase stable penicillins, β-lactamase inhibitor combinations, relevant cephems and carbapenems. Methicillin-resistant staphylococci (MRSA) were considered resistant to all currently available β-lactam antibiotics.

Table 3. Antimicrobial Susceptibility Pattern in *S. aureus*

Antibiotic	Abbreviation	Disk potency	Zone diameter			Zone diameter standards for *S. aureus*
			Sensitive	Intermediate	Resistant	
Amikacin	Ak	30 µg	≥17	15-16	≤14	20-26
Azithromycin*	Az	15 µg	≥18	14-17	≤13	21-26
Chloramphenicol	C	30 µg	≥18	13-17	≤12	19-26
Ciprofloxacin	Cf	5 µg	≥21	16-20	≤15	22-30
Rifampicin	Rf	5 µg	≥19	17-18	≤16	26-34
Fusidic acid	Fu	2.5 µg	≥22	19-20	≤17	23-28
Clindamycin	Cd	2 µg	≥21	15-20	≤14	24-30
Cotrimoxazole	Co	25 µg	≥15	16-18	≤19	24-32
Erythromycin	E	15 µg	≥23	14-22	≤13	22-30
Gatifloxacin	Ga	5 µg	≥18	15-17	≤14	27-33
Gentamicin	G	10 µg	≥15	13-14	≤12	19-27
Levofloxacin	Le	5 µg	≥17	14-16	≤13	25-30
Linezolid	Lz	30 µg	≥21	-	-	25-32
Nitrofurantoin**	Nf	300 µg	≥17	15-16	≤14	18-22
Ofloxacin	Of	5 µg	≥16	13-15	≤12	24-28
Oxacillin	Ox	1 µg	≥13	11-12	≤10	18-24
Penicillin	P	10 units	≥29	-	≤28	26-37
Sparfloxacin	Sc	5 µg	≥19	16-18	≤15	27-33
Vancomycin	Va	30 µg	≥15	-	-	17-21

*Only for isolates from sputum and throat swab.

**For urinary isolates only.

Table 4. Isolation of *S. aureus* in Relation to Methicillin Susceptibility

Methicillin susceptibility	No. (%)
Resistant	85 (32.44)
Sensitive	177 (67.56)
Total	**262 (100)**

Table 5. Antimicrobial Susceptibility Pattern in MRSA

Antibiotic	Disk content	Isolates-resistant No. (%)	Isolates sensitive No. (%)
Amikacin	30 µg	51 (60.00)	34 (40.00)
Chloramphenicol	30 µg	46 (54.12)	39 (45.88)
Ciprofloxacin	5 µg	69 (81.17)	16 (18.82)
Clindamycin	2 µg	71 (83.53)	14 (16.47)
Cotrimoxazole	25 µg	76 (89.41)	9 (10.59)
Erythromycin	15 µg	53 (62.35)	32 (37.65)
Gatifloxacin	5 µg	39 (45.88)	46 (54.11)
Gentamicin	10 µg	59 (69.41)	26 (30.59)
Levofloxacin	5 µg	14 (16.47)	71 (83.53)
Linezolid	30 µg	0 (0.00)	85 (100.00)
Ofloxacin	5 µg	20 (23.53)	65 (76.47)
Sparfloxacin	5 µg	33 (38.82)	52 (61.18)
Vancomycin	30 µg	0 (0.00)	85 (100.00)
Azithromycin* (1)	15 µg	0 (0.00)	1 (100.00)
Clarithromycin* (1)	15 µg	1 (100.00)	0 (0.00)
Nitrofurantoin**(7)	300 µg	3 (42.86)	4 (57.14)

*Only for isolates from sputum and throat swab.

** For urinary isolates only.

All the 85 MRSA isolates were tested with all the antibiotics mentioned other than the β-lactam (as per NCCLS [presently CLSI] recommendations [9]). Maximum resistance was shown to cotrimoxazole 76 (89.41%), followed by clindamycin 71 (83.53%), ciprofloxacin 69 (81.17%), gentamicin 59 (69.41%), erythromycin 53 (62.35%) and amikacin 51 (60.00%). Moderate resistance was shown to chloramphenicol 46 (54.12%), gatifloxacin 39 (45.88%) and sparfloxacin 33 (38.82%). Low level resistance was shown to ofloxacin 20 (23.53%) and levofloxacin 14 (16.47%). None of the MRSA isolates was resistant to vancomycin and linezolid (Table 5).

Out of total 85 MRSA isolates, 65 (76.47%) were from pus. Small percentage of MRSA were isolated from urine 7 (8.23%), cervical swab 4 (4.71%), ear swab 2 (2.35%), CSF 2 (2.35%), semen 2 (2.35%), conjunctival swab 1 (1.18%), Foley's tip 1 (1.185%) and sputum and throat swab 1 (1.18%) (Table 6).

All the 85 MRSA isolates were characterized on the basis of risk factors present in the patients. Among the 72 patients with hospital-acquired infection, 8 (11.11%) had no history of any risk factors. The most common risk factor present in most of the patients with HA-MRSA was prolonged stay in the hospital 16 (22.22%). This was followed by history of burns 12 (16.66%), previous history of hospitalization 10 (13.89%), interventions done on the patients 10 (13.89%) (including tracheostomy, IV catheters, Foley's catheter, medical device penetrating through skin, others); 8 (11.11%) patients gave history of previous exposure to antibiotics, 4 (5.56%) patients gave history of diabetic wound/decubitus ulcers and 4 (5.56%) were debilitated or immunocompromised (Table 7).

Table 6. Isolation Rate of MRSA in Relation to Specimen

Specimen	No. of MRSA isolates (%)
Pus (P)	65 (76.47)
Blood (B)	0 (0.00)
Endocervical swab (Cx)	4 (4.71)
Ear swab (E)	2 (2.35)
Urine (U)	7 (8.23)
Cerebrospinal fluid (CSF)	2 (2.35)
Conjuncitval swab (Cj)	1 (1.18)
Drain tip (Dt)	0 (0.00)
Foley's tip (Ft)	1 (1.18)
Fluid (Pleural, ascitic, peritoneal)	0 (0.00)
Catheter tip	0 (0.00)
Semen	2 (2.35)
Umbilical tip	0 (0.00)
Sputum and throat swab	1 (1.18)
Total	**85 (100.00)**

Table 7. Detection of MRSA in Relation to Risk Factors Present in Patients

Risk factors	No. of islates (%)		
	Hospital-acquired	Community-acquired	Total
None	8 (11.11)	7 (53.85)	15 (17.65)
Previous exposure to antibiotics	8 (11.11)	6 (46.15)	14 (16.47)
Prolonged stay in hospital	16 (22.22)	0 (0.00)	16 (18.82)
Previous history of hospitalization	10 (13.89)	0 (0.00)	10 (11.76)
Interventions*	10 (13.89)	0 (0.00)	10 (11.76)
Burn patients	12 (16.66)	0 (0.00)	12 (14.12)
Patients with diabetic wound, decubitus ulcers	4 (5.56)	0 (0.00)	4 (4.71)
Debilitated/immuno-compromised patients	4 (5.56)	0 (0.00)	4 (4.71)
Total	**72 (100.00)**	**13 (100.00)**	**85 (100.00)**

*Interventions include tracheostomy, IV catheters, Foley's catheter, medical device penetrating through skin, others.

DISCUSSION

All open skin wounds tend to be colonized by bacteria; however, it does not point to infection. Inflammation occurs in all wounds during healing, irrespective of infection and with some amount of swelling, erythema and increased warmth at the site being normal. Broken skin's defense mechanisms are impaired and thus making the environment more favorable for bacterial growth. There are three main sources for these bacteria – the environment for instance, dust, foreign bodies, bacteria on hands, clothing and equipment; the surrounding skin, as the normal skin contains commensal bacteria and from the mucous membranes. It has been reported that there has been an increase in the number of community-acquired infections in the last decades as well.

The current study is significant because most of the earlier studies have been concluded on adult patients However, the mean age of superficial skin infections in the current study was 8 ± 9 years. This is in contrast to many previous studies which have shown a mean age greater than the current study. There was a male preponderance of MRSA infections in the present study. Approximately 8% of the isolates were from male patients. Maximum number of isolates in the present study were derived from pus (7%), followed by urine isolates (9%). This was also in concert with most previous studies; however, the distribution of MRSA in given samples was more varied in the current study in comparison to previous studies.

In the current study, out of the total of 2 *S. aureus* isolates tested for methicillin susceptibility, 8 (2%) were found to be resistant to methicillin, whereas 7 (8%) were sensitive. This is slightly lesser than previous studies such as the study by Madani TA that reported 8% of *S. aureus* isolates being methicillin-resistant.[7] The prevalence of MRSA in a study from Chennai was reported as 0 -6% . *S. aureus* constituted 7% of catheter-related bloodstream infections (CRBSIs) in that center.[7] In the present study, MRSA isolation rates from ICU and wards were higher than that seen among outpatients. Patel et al reported a change in the bloodstream infections with *S. aureus* emerging as the predominant pathogen in recent years.[8]

In the current study, among all *S. aureus* isolates, antimicrobial susceptibility test results showed highest resistance to penicillin 2 (0%) followed by cotrimoxazole (8%), clindamycin (8%) and ciprofloxacin (80.91%). *S. aureus* isolates showed moderate resistance to gentamycin (6%), erythromycin (6%), amikacin (9%) and chloramphenicol (2%). Slightly low resistance was observed against quinolones, i.e., gatifloxacin (45.42%), sparfloxacin (40.08%), ofloxacin (23.66%)

and levofloxacin (10.31%). The present study reports that antibiotics other than vancomycin, for instance, clindamycin, amikacin and ciprofloxacin, can be promising if a susceptibility testing is done, reserving vancomycin for life-threatening infections. Similar findings have been reported from other studies as well.[9]

The current study also sought to underline the risk factors for MRSA infection. Among the 7 patients with hospital-acquired infection, 8 (1%) had no history of any risk factors. The most common risk factor present in most of the patients with HA-MRSA was prolonged stay in the hospital 6 (2%). This was followed by history of burns 2 (6%), previous history of hospitaliat ion 10 (8%), interventions done on the patients 0 (8%) (including tracheostomy, IV catheters, Foley's catheter, medical device penetrating through skin, others); 8 (9%) patients gave history of previous exposure to antibiotics, 4 (5%) patients gave history of diabetic wound/decubitus ulcers and 4 (5%) were debilitated or immunocompromised.

CONCLUSION

The current study was undertaken to determine the prevalence of infection caused by *S. aureus* in hospitalized and outdoor patients and to determine the prevalence of MRSA isolated from different clinical samples as well as to characterize the patients with MRSA on the basis of risk factors. In the present study, we found that, in superficial wounds, around 80% of the isolates were from the patients up to the age of 40 years and thereafter isolation rate decreased with age. There was a male preponderance of MRSA infections in the present study. Maximum number of isolates in the present study was derived from pus, followed by urine isolates. In the present study, MRSA isolation rates from ICU and wards were higher than that seen among outpatients. The most common risk factor present in most of the patients with MRSA was prolonged stay in the hospital.

REFERENCES

1. Rajaduraipandi K, Mani KR, Panneerselvam K, Mani M, Bhaskar M, Manikandan P. Prevalence and antimicrobial susceptibility pattern of methicillin resistant *Staphylococcus aureus*: a multicentre study. Indian J Med Microbiol. 2006;24(1):34-8.
2. Baba T, Takeuchi F, Kuroda M, Yuzawa H, Aoki K, Oguchi A, et al. Genome and virulence determinants of high virulence community-acquired MRSA. Lancet. 2002;359(9320):1819-27.
3. Francis JS, Doherty MC, Lopatin U, Johnston CP, Sinha G, Ross T, et al. Severe community-onset pneumonia in healthy adults caused by methicillin-resistant *Staphylococcus aureus* carrying the Panton-Valentine leukocidin genes. Clin Infect Dis. 2005;40(1):100-7.
4. Bamberger DM, Boyd SE. Management of *Staphylococcus aureus* infections. Am Fam Physician. 2005;72(12):2474-81.
5. Tenover FC, Lancaster MV, Hill BC, Steward CD, Stocker SA, Hancock GA, et al. Characterization of staphylococci with reduced susceptibilities to vancomycin and other glycopeptides. J Clin Microbiol. 1998;36(4):1020-7.
6. Appelbaum PC. The emergence of vancomycin-intermediate and vancomycin-resistant *Staphylococcus aureus*. Clin Microbiol Infect. 2006;12 Suppl 1:16-23.
7. Madani TA. Epidemiology and clinical features of methicillin-resistant *Staphylococcus aureus* in the University Hospital, Jeddah, Saudi Arabia. Can J Infect Dis. 2002;13(4):245-50.
8. Patel AK, Patel KK, Patel KR, Shah S, Dileep P. Time trends in the epidemiology of microbial infections at a tertiary care center in west India over last 5 years. J Assoc Physicians India. 2010;58 Suppl:37-40.
9. Agnihotri N, Kaistha N, Gupta V. Antimicrobial susceptibility of isolates from neonatal septicemia. Jpn J Infect Dis. 2004;57(6):273-5.

■■■■

India's COVID-19 Recovery Rate at 68%

New Delhi: COVID-9 cases in India surpassed the 0 lakh mark on 7 h August, after a record addition of 8 new cases in the previous 2 hours. The total number of recovered patients stood at 3 The recovery rate is presently estimated as 8% .

The average daily recovery (7 day moving average) has shown a rise from around 0 cases to 0 cases in the last 2 weeks, stated the Union Health Ministry. The total number of COVID-9 deaths in the country stood at 5 with the COVID fatality rate being around 2% .

COVID-9 testing is being persistently increased in order to ensure timely detection and treatment… (*ET Healthworld – TNN*)

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

TURP Syndrome – A Quick Review and Update

PARINITA C HAZARIKA

ABSTRACT

Transurethral resection of prostate syndrome (TURP-S) is one of the commonest and dreaded complications of urological endoscopic surgery. It is characterized by cardiocirculatory and neurological changes consequent to acute changes in intravascular volume and plasma solute concentrations occurring as a result of excess absorption of irrigating fluid. Even in best of hands, incidence of TURP-S is up to 20% and carries a significant mortality rate - 0.5-5% die perioperatively. It may occur at any time perioperatively and has been observed as early as few minutes after surgery has started and as late as several hours after surgery have been completed. Symptoms and signs are varied and unpredictable, and result from fluid overload and disturbed electrolyte balance and hyponatremia. Treatment is largely supportive and relies on removal of the underlying cause, and organ and physiological support. Preoperative prevention strategies are extremely important.

Keywords: TURP syndrome, constant vigilance, prevention, early diagnosis, treatment

Transurethral resection of the prostate syndrome (TURP-S), first described by Creevy in 1947 is defined as a clinical condition characterized by cardiocirculatory and neurological changes consequent to acute changes in intravascular volume and plasma solute concentrations occurring as a result of excess absorption of irrigating fluid. It is one of the commonest and dreaded complications of urological endoscopic surgery. Even in best of hands, incidence of TURP-S is up to 20% and carries a significant mortality rate - 0.5-5% die perioperatively. It may occur at any time perioperatively and has been observed as early as few minutes after surgery has started and as late as several hours after surgery have been completed. TURP-S like syndrome may occur during endoscopic procedures such as ureterorenoscopy (URS), hysteroscopic submucosal fibroid resection, transcervical resection of endometrium (TCRE), percutaneous nephrolithotomy (PCNL), etc.

PATHOPHYSIOLOGY

TURP-S affects many systems and the pathophysiology can be summarized under the following heads:

- Hypervolemia
  - Increased fluid absorption
  - Antidiuretic response to stress
- Alteration in concentration of plasma solutes
  - Hyponatremia (dilutional)
  - Hypo-osmolality
  - Hyperglycinemia
  - Hyperammonemia
  - Hypocalcemia
  - Hypoproteinemia (Hypoalbuminemia)
  - Decreased hematocrit
- Role of anesthesia and drugs
- Hemolysis
- Role of bacterial endotoxins

IMPORTANT CONSIDERATIONS

Hemolysis

When hypotonic irrigant such as distilled water is used, there is acute hypo-osmolality with massive hemolysis. Bleeding and red cell destruction are additional sources of volume and oxygen carrying capacity losses. The hemoglobinemia and hemoglobinuria coupled with hypotension can cause acute renal failure and death. Again, hyperkalemia occurring due to cell breakdown may cause cardiac arrest.

Hyponatremia

Dilutional hyponatremia (serum Na^+ <130 mmol/L) is the hallmark of TURP-S syndrome. Hyponatremia causes lowering of cell membrane potential. Thus,

Dept. of Anesthesiology
Rajan Babu Institute of Pulmonary Medicine and Tuberculosis
Kingsway Camp, Delhi

there is disturbance of nerve conduction and muscle contraction. Also, hyponatremia leads to a reduction in plasma osmolality. Hence, water enters the intracellular space causing cell edema, hemolysis, pulmonary edema, kidney failure and in severe cases cerebral edema.

Hypo-osmolality

The real cause of neuronal disturbance is the rapidly established hypo-osmolality and not hyponatremia. The effective pore size of blood brain barrier is such that it makes the barriers essentially impermeable to sodium but freely permeable to water. Physiologically, the neurons react to serum hypo-osmolality with a mechanism called 'idiogenic osmoles'. When there is acute change of serum osmolality (within minutes to hours), this compensatory mechanism may not be triggered fast enough to prevent neuronal expansion, cerebral edema and increased intracranial pressure, which in turn cause bradycardia and hypertension by cushing's reflex. A volume of more than 2 liters, gained in 1 hour can lead to TURP-S; >3.5 liters precipitates shock and multiple system dysfunction.

Hyperglycinemia

Although glycine is accepted as the most likely cause of 'visual disturbance' following TURP, it may also result in 'glycine-induced encephalopathy and seizure' and 'toxic renal effects'. The glycine absorbed with the irrigating fluid is metabolized at the hepatic and kidney level with the synthesis of ammonia, glyoxylic acid, glycolic acid, serine and elastase, which are accumulated both in blood and cerebrospinal fluid (CSF). Glycine is the major inhibitory neurotransmitter at the levels of retina, whereas glyoxylic acid and glycolic acid are neurotoxic.

Its link with the receptor of γ-aminobutyric acid (GABA) opens channels for the chloride located at the neuron surface with consequent hyperpolarization of ganglion cells (retina) thus inhibiting the neuronal impulses. Normal plasma glycine levels are 13-17 mg/ L whereas levels as high as 1,029 mg/L (up to 65 times normal) can be reached leading to transient blindness.

Glycine may also lead to encephalopathy and seizure via NMDA (*N*-methyl-D-aspartate), an excitatory neurotransmitter. Renal toxic effects of glycine may occasionally occur from hyperoxaluria (glycine metabolites-oxalate and glycolate).

Hyperammonemia

Ammonia is a major by-product of glycine metabolism. High ammonia concentration suppresses norepinephrine and dopamine release in the brain. This causes the encephalopathy of TURP-S. Fortunately ammonia toxicity is rare in man. Characteristically, the toxicity occurs within 1 hour after surgery. The patient develops nausea and vomiting and then lapses into coma. Blood ammonia rises above 60 μmol/L (normal value is 11-35 μmol/L). Hyperammonemia lasts for over 10 hours postoperatively, probably because glycine continues to be absorbed from the periprostatic space.

It is not clear why hyperammonemia does not develop in all TURP patients. Hyperammonemia implies that the body cannot fully metabolize glycine through the glycine cleavage system, citric acid cycle and conversion to glycolic acid and glyoxylic acid. Another possible explanation is arginine deficiency. Ammonia is normally converted to urea in the liver via the ornithine cycle. Arginine is one of the intermediary products necessary for this cycle. When a patient has arginine deficiency, ornithine cycle is not fuelled and thus ammonia accumulates.

SIGNS OF SYMPTOMS OF TURP-S

The first sign of significant fluid absorption is a gradual or sudden rise of blood pressure (BP) (generally between 20 and 60 mmHg) accompanied by a bradycardia (10-25 beats/min). Retrosternal chest pain is another early symptom.

Cardiopulmonary

Hypertension	Hypotension
Tachycardia	Bradycardia
Dysrhythmia	Cyanosis
Respiratory distress	Shock-death

Hemolytic and Renal

- Hyponatremia
- Hemolysis/Anemia
- Hyperglycinemia
- Acute renal failure-death

Central Nervous System

- Nausea and vomiting
- Visual disturbance- Temporary total blindness
- Confusion, restlessness
- Twitches - seizures
  Lethargy - Paralysis
  Dilated, nonreactive pupils
  Coma - death

PREVENTION OF TURP-S

This has two aspects: Surgical and anesthetic, but no method ensures that TURP-S will be avoided. Surgical preventive aspects are all designed to limit the absorption of excess irrigant during TURP.

Surgical Aspects of Prevention

- Avoidance of early capsular perforation and opening of various sinuses during TURP.
- Limiting the intravesical pressure by:
  - Adjusting the height of the irrigation bag.
  - Use of continuous flow systems or suprapubic trocar.
- Limiting the resection time to 1 hour and proper selection of gland size.
- Selection of proper irrigation fluid.
- Use of bipolar saline TURP (using sodium chloride irrigation).
- Selecting alternative intervention in high-risk cases.
- Novel and experimental approaches:
  - Intraoperative intra-prostatic vasopressin.
  - Use of 5α-reductase inhibitors.

Although TURP is still considered the gold standard, there are other attractive techniques such as Ho:YAG and potassium-titanyl-phosphate lasers, microwave ablation and cryosurgery. Their main advantages over conventional TURP include minimal blood loss, low morbidity and minimal fluid absorption.

Anesthetic Aspects of Prevention

- Preoperative screening
  - Recognizing high-risk patients for TURP-S.
  - Assigning proper ASA grade.
  - Optimization of cardiopulmonary system.
- Intra- and postoperative aspects
  - Proper choice of anesthetic technique
  - Intense monitoring of vitals:
    - SpO_2
    - ECG
    - Noninvasive BP
    - Heart rate/Pulse rate
    - End tidal CO_2 ($EtCO_2$)
    - Respiration
  - Prevention of hypothermia:
    - Adjusting OT temperature
    - Use of warm blankets, mattresses
    - Intravenous (IV) fluids and irrigating fluids pre-warming to 37°C.
  - Blood sample measurements:
    - Osmolality
    - Plasma sodium
    - Plasma glycine concentration.

(The above blood samples should be monitored just before surgery, every 15 minutes during surgery and 60 minutes after termination of operation)

- Other relevant measurements are:
  - Breath ethanol content
  - Plasma magnesium level (indicates susceptibility to seizures)
  - Serum acid phosphates
  - Arterial blood gases (may herald metabolic acidosis)
  - Plasma concentration of fluorescein
  - Plasma concentration of potassium
  - Use of load cell transducers.

Ethanol Monitoring

Highly specific and inexpensive method. This simple and safe method clearly requires a 1% ethanol marker in the irrigating fluids. It is measured by instrument called Alcomed. Cut-off level is 0.2 mg/L.

TREATMENT

- In the early phase:
  - Intraoperatively, as soon as the signs and symptoms of TURP-S appear, the following measures should be taken:
    - Alert the operating surgeon.
    - Try to minimize fluid absorption (adjusting reservoir height or putting a suprapubic trocar) and sometimes it is advisable to terminate surgery as soon as possible after proper hemostasis.
    - IV furosemide (40–80 mg) to induce diuresis.
    - Draw arterial blood sample for ABG and serum electrolytes.
- In the late intraoperative or early postoperative phase:
  - Mannitol is useful in promoting diureris and eliminating intravascular volume overload.

- Ascertain normal gaseous exchange between lungs and blood.
- Packed RBC
- O_2 by mask
- Calcium and magnesium ions to give positive inotropic effects, when needed.
- If required, support respiration by endotracheal intubation and intermittent positive pressure ventilation.
- Correct hyponatremia by using hypertonic saline (3%).
- When there is hypotension, peripheral vasoconstrictors are useful.
- In case of convulsion, short-acting anti-convulsants diazepam or midazolam IV and in resistant cases, phenytoin or barbiturates can be given.
- Packed RBC rather than whole blood is indicated in case of significant blood loss.
- Restricted and cautious administration of IV fluid is necessary as these patients are very prone to pulmonary edema.
- For temporary total blindness, reassurance that unimpaired vision is expected to return within 24 hours is the best treatment as half-life of glycine is only 8 minutes.

CLINICAL RELEVANCE

Circulatory overload occurs when weight of prostate is >45 g. Ideal height of irrigating fluid is 60 cm, so that approximately 300 mL of fluid is obtained per minute for good vision. Symptoms of water intoxication appear when serum sodium level falls 15-20 mEq/L below normal levels. Clonus and positive Babinski responses are seen. Papilloedema with dilated, sluggishly reacting pupils and low voltage EEG can occur. When serum sodium level is below 120 mEq/L, there is hypotension due to reduced myocardial contractility. Below 115 mEq/L, bradycardia, widening of QRS complexes, ventricular ectopics and T-wave inversion are seen. At levels below 100 mEq/L generalized seizures coma, respiratory arrest, ventricular tachycardia, ventricular fibrillation and finally cardiac arrest occurs. Sodium deficit = Normal serum sodium-estimated serum sodium × volume of body water (body water is usually 60% of body weight).

The most feared complication of correcting hyponatremia is central pontine myelinolysis (CPM), also referred to as 'osmotic demyelination syndrome' as demyelination can occur in extrapontine areas. Also CPM is most commonly seen in women, probably due to sex differences in cellular ion pump capacity. It has been reported after rapid as well as slow correction of serum sodium concentration in TURP patients. About 1.5-2 mmol/L/hr correction in the serum sodium levels has been suggested to be safe. Visual disturbances: Transient blindness, foggy vision and patients see halos around objects. Pupils may be dilated and unresponsive. Optic disc appears normal. Perception to light and blink responses are preserved but pupillary responses to light and accommodation are lost in TURP blindness.

SUMMARY

TURP is a procedure carried out on predominantly elderly population with a higher incidence of co-existing disease. Consequently anesthetizing for the procedure may present a challenge. Early detection and prompt treatment of the syndrome are vital for a favorable outcome. Newer techniques of TURP promise a reduced risk of TURP-S.

SUGGESTED READING

1. Creevy CD. Hemolytic reactions during transurethral prostatic resection. J Urol. 1947;58(2):125-31.
2. Ghanem AN, Ward JP. Osmotic and metabolic sequelae of volumetric overload in relation to the TUR syndrome. Br J Urol. 1990;66(1):71-8.
3. Gravenstein D. Transurethral resection of the prostate (TURP) syndrome: a review of the pathophysiology and management. Anesth Analg. 1997;84(2):438-46.
4. Malhotra V. Transurethral resection of the prostate. Anesthesiol Clin North America. 2000;18(4):883-97, x.
5. Bakan N, Gedik E, Ersoy O. Early detection of the TURP syndrome. Anesth Analg. 2000;91(1):250-1.
6. Moorthy HK. Philip S. Serum electrolytes in TURP syndrome - is the role of potassium underestimated? Indian J Anaesth. 2002;46(6):441-4.
7. Norris HT, Aasheim GM, Sherrard DJ, Tremann JA. Symptomatology, pathophysiology and treatment of the transurethral resection of the prostate syndrome. Br J Urol. 1973;45(4):420-7.
8. Hoekstra PT, Kahnoski R, McCamish MA, Bergen W, Heetderks DR. Transurethral prostatic resection syndrome - a new perspective: encephalopathy with associated hyperammonemia. J Urol. 1983;130(4):704-7.
9. Olsson J, Hahn RG. Ethanol monitoring of irrigating fluid absorption in transcervical resection of the endometrium. Acta Anaesthesiol Scand. 1995;39(2):252-8.

10. Hahn RG. Ethanol monitoring of irrigating fluid absorption. Eur J Anaesthesiol. 1996;13(2):102-15.
11. Olsson J, Nilsson A, Hahn RG. Symptoms of the transurethral resection syndrome using glycine as the irrigant. J Urol. 1995;154(1):123-8.
12. Hahn RG, Ekengren JC. Patterns of irrigating fluid absorption during transurethral resection of the prostate as indicated by ethanol. J Urol. 1993;149(3):502-6.
13. Mebust WK. Transurethral surgery. In: Walsh PC, Retik AB, Stamey TA, Vaughan ED (Eds.). Campbell's Urology. Philadelphia: Saunders; 1992. pp. 2900-19.
14. Henderson DJ, Middleton RG. Coma from hyponatremia following transurethral resection of prostate. Urology. 1980;15(3):267-71.
15. Bernstein GT, Loughlin KR, Gittes RF. The physiologic basis of the TUR syndrome. J Surg Res. 1989;46(2):135-41.
16. Zhang W, Andersson BS, Hahn RG. Effect of irrigating fluids and prostate tissue extracts on isolated cardiomyocytes. Urology. 1995;46(6):821-4.
17. Hahn RG, Essén P. ECG and cardiac enzymes after glycine absorption in transurethral prostatic resection. Acta Anaesthesiol Scand. 1994;38(6):550-6.
18. Evans JW, Singer M, Coppinger SW, Macartney N, Walker JM, Milroy EJ. Cardiovascular performance and core temperature during transurethral prostatectomy. J Urol. 1994;152(6 Pt 1):2025-9.
19. Ashton CM, Lahart CJ, Wray NP. The incidence of perioperative myocardial infarction with transurethral resection of the prostate. J Am Geriatr Soc. 1989;37(7): 614-8.
20. Krohn JS. Dilutional hypocalcemia in association with dilutional hyponatremia. Anesthesiology. 1993;79(5): 1136-8.
21. Roesch RP, Stoelting RK, Lingeman JE, Kahnoski RJ, Backes DJ, Gephardt SA. Ammonia toxicity resulting from glycine absorption during a transurethral resection of the prostate. Anesthesiology. 1983;58(6):577-9.
22. Hahn RG, Stalberg HP, Ekengren J, Rundgren M. Effects of 1.5% glycine solution with and without 1% ethanol on the fluid balance in elderly men. Acta Anaesthesiol Scand. 1991;35(8):725-30.
23. Périer C, Mahul P, Molliex S, Auboyer C, Frey J. Progressive changes in glycine and glycine derivatives in plasma and cerebrospinal fluid after transurethral prostatic resection. Clin Chem. 1990;36(12):2152-3.
24. Harrison RH 3rd, Boren JS, Robison JR. Dilutional hyponatremic shock: another concept of the transurethral prostatic resection reaction. J Urol. 1956;75(1):95-110.
25. Hahn RG. Fluid and electrolyte dynamics during development of the TURP syndrome. Br J Urol. 1990;66(1):79-84.
26. Hahn RG. Acid phosphatase levels in serum during transurethral prostatectomy. Br J Urol. 1989;64(5):500-3.
27. Sohn MH, Vogt C, Heinen G, Erkens M, Nordmeyer N, Jakse G. Fluid absorption and circulating endotoxins during transurethral resection of the prostate. Br J Urol. 1993;72(5 Pt 1):605-10.
28. Ovassapian A, Joshi CW, Brunner EA. Visual disturbances: an unusual symptom of transurethral prostatic resection reaction. Anesthesiology. 1982;57(4):332-4.
29. Hahn RG. Irrigating fluids in endoscopic surgery. Br J Urol. 1997;79(5):669-80.
30. Hahn RG. Transurethral resection syndrome from extravascular absorption of irrigating fluid. Scand J Urol Nephrol. 1993;27(3):387-94.
31. Weber S, Acuff JH, Mazloomdoost M, Kirimli BI. Transurethral prostatectomy complicated by intraperitoneal extravasation of irrigating fluid. Can J Anaesth. 1987;34(2):193-5.
32. Hahn RG. Transurethral resection syndrome after transurethral resection of bladder tumours. Can J Anaesth. 1995;42(1):69-72.
33. Stjernström H, Henneberg S, Eklund A, Tabow F, Arturson G, Wiklund L. Thermal balance during transurethral resection of the prostate. A comparison of general anaesthesia and epidural analgesia. Acta Anaesthesiol Scand. 1985;29(7):743-9.
34. Ekengren J, Zhang W, Hahn RG. Effects of bladder capacity and height of fluid bag on intravesical pressure during transurethral resection of the prostate. Eur Urol. 1995;27(1):26-30.
35. Madsen PO, Frimodt-Møller PC. Transurethral prostatic resection with suprapubic trocar technique. J Urol. 1984;132(2):277-9.
36. Ekengren J, Hahn RG. Continuous versus intermittent flow irrigation in transurethral resection of the prostate. Urology. 1994;43(3):328-32.
37. Singer M, Patel M, Webb AR, Bullen C. Management of the transurethral prostate resection syndrome: time for reappraisal? Crit Care Med. 1990;18(12):1479-80.
38. Hahn RG, Nilsson A, Hjelmqvist H, Zhang W, Rundgren M. Renal function during intravenous infusion of urological irrigating fluids in the sheep. Acta Anaesthesiol Scand. 1996;40(6):671-8.
39. Hoffman RM, MacDonald R, Wilt TJ. Laser prostatectomy for benign prostatic obstruction. Cochrane Database Syst Rev. 2004;(1):CD001987.
40. O'Donnell AM, Foo IT. Anaesthesia for transurethral resection of the prostate. Contin Educ Anaesth Crit Care Pain. 2009;9(3):92-6.
41. Jennifer Heisler,RN, About.Com. Guide May 27, 2010. Available at: http://surgery.about.com/bio/Jennifer-Heisler-RN-41438.htm
42. Rocco B, Albo G, Ferreira RC, Spinelli M, Cozzi G, Dell'orto P, et al. Recent advances in the surgical treatment of benign prostatic hyperplasia. Ther Adv Urol. 2011;3(6):263-72.

"D" world for all age group

Vitamin D

In Vitamin D_3 Deficiency and Insufficiency

Rx **zinDee®**

Cholecalciferol 60,000 I U

Chewable Tablets
Sachets

The Essential Add On Vitamin

Chewable Tablet

Sachet

2020

FRANCO-INDIAN PHARMACEUTICALS PVT. LTD.
20, Dr. E. Moses Road, Mumbai 400 011.

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

One-Step versus Two-Step Diagnostic Test for Gestational Diabetes Mellitus

SUKRITI GUPTA*, SHASHI BALA ARYA†, RASHMI RAMANUJ PRASAD‡, TARIQ MAHMOOD#, JK GOEL¥

ABSTRACT

Aim: Comparison between one-step Diabetes in Pregnancy Study Group India (DIPSI) and American Diabetes Association (ADA) recommended two-step oral glucose tolerance test (OGTT). **Material and methods:** This study has a sample size of 200; 100 participants each were subjected to either of the two tests. Gestational diabetes mellitus (GDM) and non-GDM diagnosed by one-step test versus two-step test, respectively, were compared to one another and results were compared on the basis of various antenatal complications and fetomaternal outcomes. **Results:** No statistical difference was found between both the groups on the basis of various antenatal and fetomaternal outcomes. **Conclusion:** In Indian subcontinent with poor resources and lack of follow-up, single-step DIPSI can be preferred to ADA recommended two-step OGTT; however, large database studies are still required.

Keywords: Gestational diabetes mellitus, Diabetes in Pregnancy Study Group India, one-step test, two-step oral glucose tolerance test

Diabetes mellitus is a disorder of carbohydrate metabolism. Diabetes complicating pregnancy has become more common worldwide. Gestational diabetes mellitus (GDM) refers to carbohydrate intolerance that is recognized or develops during pregnancy, irrespective of the treatment with diet or insulin. Women with a history of GDM have a higher risk of future diabetes, particularly type 2 diabetes, and the same holds true for their children.[1] Besides, any glucose intolerance in pregnant women without GDM has been linked with escalated adverse maternal and fetal outcomes. Thus, GDM should be considered as a key opportunity to develop, test and implement clinical strategies for the prevention of diabetes. Action taken at the right time to screen all pregnant women for glucose intolerance, achieve euglycemia and ensure adequate nutrition could help prevent the vicious cycle of passing on glucose intolerance from one generation to another.

In the Indian context, screening for diabetes becomes all the more crucial during pregnancy as Indian women have an 11 fold increased risk of developing glucose intolerance during pregnancy compared to Caucasian women.[2]

The world prevalence of diabetes among adults was around 6.4% in 2010, affecting 285 million adults and is estimated to increase up to 7% and 439 million adults by 2030. Abnormal maternal glucose regulation has been noted in nearly 30% of pregnancies.

Routine screening is required in the Indian subcontinent because of multifactorial pathology predisposing women to this pregnancy associated comorbidity, the associated risk factors and long-term side effects. Also to mention, the low-cost of screening in a country like India with limited resource availability.

The American College of Obstetricians and Gynecologists (ACOG) recommends universal screening for GDM with a 50 g 1 hour loading test at 24–28 weeks followed by 100 g, 3 hour oral glucose tolerance test (OGTT) for diagnosis. In this approach, a 50 g glucose challenge test, or the O'Sullivan test, is first performed which, if positive, is followed by an OGTT.[3]

After the Hyperglycemia and Adverse Pregnancy Outcome (HAPO) study, the World Health

*Junior Resident
†Professor
‡Assistant Professor
Dept. of Obstetrics and Gynecology
#Professor and Head of Department, Dept. of Biochemistry
¥Professor and Head of Department, Dept. of Obstetrics and Gynecology
Shri Ram Murti Smarak Institute of Medical Sciences, Bareilly, Uttar Pradesh
Address for correspondence
Dr Shashi Bala Arya
Professor
Dept. of Obstetrics and Gynecology, Shri Ram Murti Smarak Institute of Medical Sciences, Bareilly-Nanital Road, Bhojipura, Bareilly, Uttar Pradesh - 243 202
E-mail: sukritigupta2010@gmail.com

Organization (WHO) validated Diabetes in Pregnancy Study Group India (DIPSI) as a single step procedure in screening GDM. In the antenatal clinic, after preliminary examination, the pregnant women will be given 75 g glucose load orally, irrespective of her fasting status or timing of previous meal. GDM is diagnosed, if post 2-hour blood glucose value is found to be ≥140 mg/dL.[4-6] This single step procedure has been approved by the Ministry of Health, Govt. of India and also recommended by the WHO.

The International Association of Diabetes and Pregnancy Study Groups (IADPSG) in 2010 recommended new terminology and diagnostic cut offs for GDM based on the hyperglycemia and pregnancy outcome study. According to IADPSG guidelines, diabetes first recognized in pregnancy can be classified as gestational or overt. The criteria for diagnosing include:

- Fasting plasma glucose (FPG) ≥126 mg/dL
- Glycated hemoglobin (HbA1c) ≥6.5%
- Random plasma glucose >200 mg/dL.

Successful screening test requires that the condition should be prevalent in the target population (which diabetes is, in Indian subcontinent), screening improves the prognosis and available treatment is effective. There have been several screening guidelines based on the suitability of the test to the population characteristics, cost and screening accuracy. Numerous controversies still exist regarding the test to be used and when the screening strategy should be applied. Factors like clinical judgment and available resources have a key role in choosing the best possible mode for evaluation of GDM, the different screening and diagnostic practices for GDM, and in finally outlining the best suitable option for our economy and population. With so many routine screening options available for GDM, it becomes a challenge in itself for Indian obstetrics to choose the most suited testing method appropriate for a limited resource and poor follow-up economy like ours. Thus, this study was undertaken.

MATERIAL AND METHODS

Source of Data

It was a hospital-based study. All pregnant women in second trimester between 24 and 28 weeks of gestational age, who attend antenatal clinic at Shri Ram Murti Smarak Institute of Medical Sciences (SRMS-IMS), Bareilly, Uttar Pradesh, in a time of 2 years were enrolled in this study after providing informed consent.

Inclusion Criteria

- All consenting pregnant women in second trimester between 24 and 28 weeks who attended antenatal clinic at SRMS-IMS, Bareilly, Uttar Pradesh.
- Pregnant women of any parity.
- Singleton pregnancy.

Exclusion Criteria

- Pregestational diabetes.
- Chronic diseases/cardiac/hepatic/respiratory diseases/ any other medical or surgical diseases.
- Taking drugs that alter glucose metabolism.
- Patients who refuse to participate.

Method of Collection of Data

Study design: A clinical study.

Sample size: Two hundred consecutive pregnant women between 24 and 28 weeks of gestational age who attended antenatal clinic of SRMS-IMS, Bareilly, Uttar Pradesh, over a time period of 2 years were included in the study after providing informed consent and were randomized into two groups having 100 patients in each group.

Sample: It is a hospital-based study.

Place: SRMS-IMS, Bareilly, Uttar Pradesh.

Duration: Two years; from October 2017 to November 2019

Method:

- A hospital-based clinical study designed to compare one-step versus two-step screening test for GDM. A detailed clinical assessment of patient was performed in the outpatient department (OPD), including history (family history of diabetes, history of previous pregnancies and socioeconomic status, etc.), general physical examination and obstetric examination. Routine investigations during antenatal visits were done. Informed consent of participation was taken during this initial assessment.
- A standard form was used to record the date of the tests performed, detailed clinical assessment of patient, including history and examination findings, investigations, including the test results.

Cut-off values of one-step procedure in screening of GDM:[5,6]

Criteria for Positive Screening of GDM	
DIPSI criteria for screening GDM	2-hour PPBS
Nonfasting OGTT with 75 g glucose	>140 mg/dL

The American Diabetes Association (ADA) recommends, in a two-step procedure, an initial screening by measuring plasma glucose 1 hour after 50 g oral glucose challenge test (OGCT). Those found to be positive at the screening test undergo 100 g OGTT.

ADA Criteria for Diagnosis of GDM

100 g OGTT	Cut-off values
Fasting	95 mg/dL (5.3 mmol/L)
1 hour	180 mg/dL (10 mmol/L)
2-hour	155 mg/dL (8.6 mmol/L)
3-hour	140 mg/dL (7.8 mmol/L)

Two or more of the venous plasma concentrations must be met or must exceed the above values for a positive diagnosis.

Patients who had a positive outcome to either of the screening tests were followed up in high-risk antenatal clinic. Outcome was noted during antenatal period, and as type of delivery, mode of delivery and postpartum events. Fetal outcome was observed. Under high-risk antenatal clinic, they were called for a follow-up fortnightly from 28 to 32 weeks, and weekly thereafter.

Standard management protocol for GDM was followed in patients screening positive by one-step or two-step technique.

Patients in whom the screening test came out negative were followed-up in regular antenatal clinic.

OBSERVATIONS AND RESULTS

This clinical study was conducted in the Dept. of Obstetrics and Gynecology, SRMS-IMS, Bareilly, Uttar Pradesh, India.

The aim of this study was to compare one-step versus two-step diagnostic test for GDM on the basis of various maternal, intrapartum and fetal parameters. A total of 200 antenatal women were recruited in this study; 100 women in each group.

The fetal, maternal and intrapartum outcomes of GDM patients and non-GDM patients of Group A and Group B were compared.

Out of 100 patients in Group A, 12 were found to have GDM by DIPSI criterion and rest 88 were taken as controls (Table 1). In Group B, 10 had GDM and rest 90 were taken as controls (Table 1). In our study, we found that the mean age of patients in Group A was 24.77 years and in Group B was 24.75 years. While comparing parity, as shown in Table 2, 59% and 37% patients in Group A and Group B were primigravidas, and 33% and 53% in Group A and Group B were second gravidas, respectively. Maximum patients in both the groups were either primi- or second gravidas. The mean body mass index (BMI) in patients of Group A was 21.708 kg/m^2 and in Group B was 21.018 kg/m^2. Maximum patients in both the groups had a BMI in the range of 20-25 kg/m^2 (Table 2).

While comparing genitourinary infections, the occurrence rate was 18% in non-GDM patients in Group A compared to 7% in Group B in the given antenatal period. On the contrary, 33% in patients with GDM in Group A and 20% patients with GDM in Group B were found to have genitourinary tract infections (Tables 3 and 4).

About 9% non-GDM patients in Group A and 8% non-GDM patients in Group B had gestational hypertension as an antenatal complication. Twenty-five percent of GDM patients in Group A and 30% of GDM patients in Group B had gestational hypertension as an antenatal complication (Tables 3 and 4).

Table 1. Case Distribution

Case distribution	DIPSI (Group A)	GTT (Group B)	P value
GDM	12	10	0.651
Non-GDM	88	90	
Total	**100**	**100**	

Table 2. Demographic Features

Demographic feature	Group A	Group B
Mean age	24.77	24.75
Mean BMI	21.708	21.018
Parity	P1-P2	P1-P2

Table 3. Maternal Complications in GDM Patients

Maternal complications	GDM (Group A)	GDM (Group B)	P value
Genitourinary infections	4 (33%)	2 (20%)	0.348
Gestational hypertension	3 (25%)	3 (30%)	1
Pre-eclampsia	4 (33.33%)	3 (30%)	1
PROM	4 (33.33%)	2 (20%)	0.646
Preterm delivery	3 (25%)	2 (20%)	1

About 9% of non-GDM patients in Group A and 6% of non-GDM patients in Group B had pre-eclampsia as an antenatal complication; 3% GDM patients in Group A and 0% patients in Group B had pre-eclampsia as an antenatal complication (Tables 3 and 4).

About 5% non-GDM patients in Group A and 6% non-GDM patients in Group B had premature rupture of membrane (PROM) complicated pregnancies; 3% GDM patients in Group A and 20% GDM patients in Group B had PROM as an antenatal complication (Tables 3 and 4).

About 8% non-GDM patients of Group A and 6% non-GDM patients of Group B had premature deliveries (<37 weeks). Twenty-five percent of GDM patients in Group A and 0% of GDM patients in Group B had premature deliveries (<37 weeks) (Tables 3 and 4).

Around 8% non-GDM patients in Group A had preterm vaginal delivery, 6% had full-term vaginal delivery and 25.8% had cesarean section (Table 5). None of the patients underwent instrumental delivery.

Table 4. Maternal Complications in Non-GDM Patients

Maternal complications	Non-GDM (Group A)	Non-GDM (Group B)	P value
Genitourinary infections	10 (11.36%)	7 (7.77%)	0.416
Gestational hypertension	8 (9.09%)	8 (8.88%)	0.962
Pre-eclampsia	9 (10.22%)	6 (6.66%)	0.393
PROM	5 (5.68%)	6 (6.66%)	0.785
Preterm delivery	6 (6.81%)	6 (6.66%)	0.968

Table 5. Mode of Delivery in Non-GDM Patients

Mode of delivery	Non-GDM (Group A)	Non-GDM (Group B)	P value
Preterm vaginal delivery	5 (5.81%)	4 (4.59%)	0.908
Full-term vaginal delivery	59 (68.60%)	59 (67.81%)	
Instrumental delivery	0 (0)	0 (0)	
Cesarean section	22 (25.58%)	24 (27.58%)	
Total	**86 (100%) + 2 (Stillborn)**	**87 (100%) + 3 (Stillborn)**	

In Group B, 9% non-GDM patients underwent preterm vaginal delivery, 8% had full-term vaginal delivery and 2% patients had cesarean section. None in Group B also underwent instrumental delivery; 2 stillborn deliveries in Group A and 3 stillborn deliveries in Group B were excluded from the above distribution.

Ten percent GDM patients in Group A and 1% GDM patients in Group B had preterm vaginal deliveries. Forty percent GDM patients in Group A and 4% GDM patients in Group B had full-term vaginal delivery. None of the patients in both the groups had instrumental delivery. Fifty percent in Group A and 4% in Group B had cesarean section, respectively. Two patients from Group A and 1 from Group B were excluded from the above case distribution as they had stillborn delivery (Table 6).

Two non-GDM patients of Group A and 3 non-GDM patients in Group B had intrauterine fetal demise or stillborn deliveries. Two out of 12 GDM patients of Group A and 1 out of 10 GDM patients of Group B had stillborn deliveries or intrauterine fetal demise (Tables 7 and 8). None of the non-GDM patients in both

Table 6. Mode of Delivery in GDM Patients

Mode of delivery	GDM (Group A)	GDM (Group B)	P value
Preterm vaginal delivery	1 (10%) + 2 (Stillborn)	1 (11.11%) +1 (Stillborn)	0.971
Full-term vaginal delivery	4 (40%)	4 (44.44%)	
Instrumental delivery	0 (0)	0 (0)	
Cesarean section	5 (50%)	4 (44.44%)	
Total	**10 (100%) + 2 (Stillborn)**	**9 (100%) +1 (Stillborn)**	

Table 7. Fetal Complications in GDM Patients

Fetal complications	GDM (Group A)	GDM (Group B)	P value
Stillborn	2 (16.66%)	1 (10%)	1
Shoulder dystocia	1 (8.33%)	0	1
Fetal malformations	1 (8.33%)	0	1
Respiratory distress	2 (16.66%)	2 (20%)	1
NICU admission	5 (41.66%)	4 (40%)	1

Table 8. Fetal Complications in Non-GDM Patients

Fetal complications	Non-GDM (Group A)	Non-GDM (Group B)	P value
Stillborn	2 (2.27%)	3 (3.33%)	1
Shoulder dystocia	0	0	1
Fetal malformations	0	2 (2.22%)	0.497
Respiratory distress	3 (3.40%)	3 (3.33%)	1
NICU admission	4 (4.54%)	7 (7.77%)	0.371

the groups had shoulder dystocia during delivery. One out of 12 GDM patients in the Group A and none of the GDM patients in the Group B had shoulder dystocia during delivery (Tables 7 and 8).

None of the non-GDM patients in Group A had fetal malformations, whereas 2 out of 90 in the non-GDM patients of Group B had this complication. One neonate born to GDM mother in Group A had congenital malformation at the time of birth. However, none of the neonates born to GDM mothers in the Group B had this complication (Tables 7 and 8).

About 8% neonates of non-GDM women in Group A and 3% neonates of non-GDM women in Group B had respiratory distress. Two out of 12 GDM patients in Group A and 2 out of 10 GDM patients in Group B had neonates with respiratory distress (Tables 7 and 8).

About 4% infants of non-GDM patients in Group A and 7% infants of non-GDM patients in Group B had neonatal intensive care unit (NICU) admission after delivery (Table 8).

DISCUSSION

Gestational diabetes mellitus refers to any degree of glucose intolerance which arises or is recognized for the first time during pregnancy. It may or may not undergo remission after the end of pregnancy. In comparison with European women, GDM prevalence has increased 1 times in women from the Indian subcontinent.[7] In this study, 100 patients underwent one-step diagnostic test for GDM between 24 and 28 weeks of pregnancy, and same number of comparable antenatal women were subjected to two-step procedure. The diagnostic accuracy appears to be the same by both the tests as the detection rate of GDM was statistically same with insignificant p value between the two groups.

Most of the women recruited in this study belonged to the age group of 21–30 years, thus indicating the increased awareness in the younger population toward antenatal check-ups and hospital delivery. A study done by Qadir et al,[8] had a higher incidence of GDM in higher age group women. In the study done by Priyanka,[9] it was noted that GDM cases belonged mostly to 26-30 years of age group. In our study, the distribution of cases according to parity showed that majority of cases ie, 9% , were primigravida in Group A and 7% were primigravida in Group B. Only 5% women in Group A and 4% in Group B were of grand multiparity status. This further emphasizes our observation of willingness among young women for routine antenatal check-up, follow-up and institutional/hospital deliveries.

We observed that average BMI of GDM patients was 24.70 kg/m^2 in Group A and 24.51 kg/m^2 in Group B. However, a relatively lower mean BMI was observed in non-GDM patients of both the groups - 21.29 kg/m^2 in Group A and 20.63 kg/m^2 in Group B, respectively. The difference in BMI of both the groups was found to be statistically insignificant, but we observed a higher BMI in GDM patients as compared to the non-GDM patients.

In our study, we have compared the various feto-maternal and intrapartum complications of GDM in both the groups by applying different tests. No difference was observed between both the groups on comparing genitourinary complications. It was also noted that the incidence of genitourinary infections was much higher in the GDM when compared to non-GDM patients. In concordance with our study, a study done by Qadir et al also showed that the incidence of recurrent urinary tract infection and vulvovaginal infections in GDM patients is high when compared to non-GDM patients.

The incidence of gestational hypertension was observed to be much higher in GDM patients of Group A, ie, 2% and of Group B (8%). In the non-GDM patients, the incidence was only 0% and 8% in both the groups, respectively (p = 0.962). Similar findings were noted on comparing the incidence of pre-eclampsia in GDM patients of both the groups with a p value of 1 In a study conducted by Sinha et al,[10] 2% of the DIPSI and 8% OGTT group had hypertensive disorders as comorbidity in their study. Similar to our study, this study also showed no significant difference in both the groups when the parameter hypertensive disorders was compared and an equal predictive value of GDM pregnancies complicated by hypertensive disorders was found by both the tests. Like our study, in the study conducted by Qadir et al, the frequency of hypertensive disorders was higher, though not statistically significant in the GDM patients. Also the parameter PROM was studied in the non-GDM and GDM patients of both the groups. The p value of both the groups in GDM and

non-GDM patients was 0 and 5 respectively, suggesting no statistical difference and the groups to be comparable. Also, the incidence of the parameter was much higher in GDM patients. Similar to our study, a study conducted by Qadir et al also showed higher occurrence of PROM in GDM patients. When the incidence in the GDM and non-GDM patients of both the groups was compared, no statistical difference was observed. However, the incidence of preterm delivery was much higher in GDM group as compared to non-GDM (2% and 20% in GDM patients of Group A and Group B). Saxena et al found an incidence of 2% .[11]

The incidence of normal vaginal deliveries were noted to be lower in GDM patients - 40% in Group A and 44.44% in Group B. None of the patients in both the groups had an instrumental delivery as all the difficult deliveries were mostly subjected to cesarean section in our institute. When the rate of cesarean section was compared, it was found to be twice as much higher in the GDM group as compared to the non-GDM group. Unlike our study, a study conducted by Priyanka stated that 73.33% GDM patients had vaginal deliveries and only 19.44% had cesarean section. Like our study, in the study conducted by Sinha et al, 50% patients diagnosed with GDM by both the tests underwent cesarean and thus the tests were proved to be comparable.

Stillbirth and intrauterine fetal demise are known complications of GDM in the third trimester, as stated in literature. In this study, the incidence of stillborn deliveries in the non-GDM patients was observed to be 2% and 3% in Group A and Group B, respectively. However, in the GDM patients, the incidence was found to be much higher, 6% and 0% in Group A and Group B, respectively. On applying statistical tests, the difference between the two groups in both GDM and non-GDM patients was found to be insignificant. A study conducted by Priyanka, showed that GDM complicated pregnancies had live birth rate of 8% and intrauterine death was noted in 2% women. On studying the case distribution of shoulder dystocia in non-GDM and GDM patients of both the groups, none of the non-GDM patients had this complication during delivery; however, in GDM complicated pregnancies, 1 patient in Group A and none in the Group B had shoulder dystocia.

In our study, 2 out of 0 non-GDM patients in Group B and none in Group A had fetal malformations. In GDM pregnancies, the incidence rate of 8% was noted for the complication in Group A. However, none of the GDM pregnancies diagnosed by two-step test had fetal malformations. The study group was thought to be too small to draw a comparison between the GDM and non-GDM patients in regard to this parameter. On applying statistical tests, the value was found to be insignificant but not much relevant and the two groups were comparable. Sinha et al also found similar results.

On comparing the incidence of respiratory distress in infants of non-GDM group, it was found to be only 0% and 3% in Group A and Group B, respectively; however, diabetes complicated pregnancies had a much higher incidence of 6% and 2% in Group A and Group B. Lastly, on comparing the incidence of NICU admission in the two groups, 5% and 7% babies born to non-GDM mothers were admitted to NICU in Group A and Group B, respectively, immediately after birth. However, a very high incidence was observed in the babies of GDM mothers, ie, 6% and 0% in Group A and Group B (p = 1). Like our study, in the study done by Sinha et al, 3% cases of DIPSI group and 0% cases of GTT group developed respiratory distress. Difference between the two was not statistically significant.

In this study, we have compared various complications of GDM in both the groups and we observed no statistical difference. Also, no difference exits in the diagnostic accuracy of both the tests. Similar to our study, the study conducted by Sinha et al also observed no statistical difference between one-step and two-step procedure in respect to various maternal and fetal outcomes.

CONCLUSION

The incidence of GDM in this study was found to be 2% by one-step and 0% by two-step procedure. The high pick up rate was attributed to our institute being a tertiary care center with maximum cases of complicated pregnancy. The statistical difference between both the groups in regard to all the parameters studied was found to be insignificant.

Hence, we state that one-step test, which is more feasible, economical and applicable in population of India, may help in fighting to diagnose GDM, reducing feto-maternal morbidity associated with it, in comparison to a more cumbersome and robust two-step diagnostic test recommended by the ACOG.

In our study, we compared and studied the statistical difference of various maternal, fetal and intrapartum complications among two different groups. No statistical difference was observed between all the parameters assessed in this study. Thus, we conclude that both the

tests not only have an equal predictive rate for various complications but also equally effective in diagnosing GDM. Timely diagnosis and management of GDM will prevent diabetes in future life. If adequate obstetric care is provided to the antenatal patients with GDM, many maternal, fetal and intrapartum complications can be markedly reduced, especially in low resource countries like India.

Thus, we suggest that ACOG recommended two-step test, which is less feasible and applicable in Indian population can be safely replaced by one-step diagnostic test. However, to state such a fact, large scale studies, exhaustive follow-up and meta-analysis is required. For us, as clinicians, it's our role to fight against all odds in converting the Diabetes Capital of the World to a well-controlled diabetic country.

REFERENCES

1. Dornhorst A, Rossi M. Risk and prevention of type 2 diabetes in women with gestational diabetes. Diabetes Care. 1998;21 Suppl 2:B43-B49.
2. Dornhorst A, Paterson CM, Nicholls JS, Wadsworth J, Chiu DC, Elkeles RS, et al. High prevalence of gestational diabetes in women from ethnic minority groups. Diabet Med. 1992;9(9):820-5.
3. O'Sullivan JB, Mahan CM. Criteria for the oral glucose tolerance test in pregnancy. Diabetes. 1964;13:278-85.
4. Seshiah V, Balaji V, Balaji MS, Sekar A, Sanjeevi CB, Green A. One step procedure for screening and diagnosis of gestational diabetes mellitus. J Obstet Gynecol India. 2005;55(6):525-9.
5. Seshiah V. Fifth National Conference of Diabetes in Pregnancy Study Group, India. J Assoc Physicians India. 2010;58:329-30.
6. Seshiah V, Das AK, Balaji V, Joshi SR, Parikh MN, Gupta S; Diabetes in Pregnancy Study Group. Gestational diabetes mellitus - guidelines. J Assoc Physicians India. 2006;54:622-8.
7. Kalra P, Kachhwaha CP, Singh HV. Prevalence of gestational diabetes mellitus and its outcome in western Rajasthan. Indian J Endocrinol Metab. 2013;17(4):677-680.
8. Qadir SY, Yasmin T, Fatima I. Maternal and foetal outcome in gestational diabetes. J Ayub Med Coll Abbottabad. 2012;24(3-4):17-20.
9. Priyanka. Maternal and foetal outcome in patients of gestational diabetes mellitus. Int J Reprod Contracept Obstet Gynecol. 2018;7(9):3831-6.
10. Sinha S, Mayadeo NM. Comparison of maternal and fetal outcomes in gestational diabetes mellitus diagnosed either by oral glucose tolerance test or diabetes in pregnancy study group India. Int J Reprod Contracept Obstet Gynecol. 2017;6(10):4526-33.
11. Saxena P, Tyagi S, Prakash A, Nigam A, Trivedi SS. Pregnancy outcome of women with gestational diabetes in a tertiary level hospital of north India. Indian J Community Med. 2011;36(2):120-3.

■■■■

Heart Attack Patients may be Dying Due to Coronavirus Fears, Says Study

Investigators from the Providence Heart Institute system in the US northwest analyzed the records of over 15,000 heart attack patients from December 30 to May 16 of this year and noted key changes in heart attack hospitalization rates. Writing in *JAMA Cardiology*, investigators noted a considerable reduction in hospitalizations early in the pandemic, with the case rates beginning to fall on February 23. Patients hospitalized for a heart attack during the pandemic appeared to be younger by about 1-3 years versus patients prior to the pandemic. The authors believe that older patients may have been more reluctant to get medical help if they had symptoms… (*CNN*)

FDA OKs Oral Treatment for Spinal Muscular Atrophy

The US FDA has granted approval to risdiplam for the treatment of patients aged 2 months and older with spinal muscular atrophy (SMA), making it the second drug and the first oral drug approved to treat this disease.

The efficacy of the drug for the treatment of patients with infantile-onset and later-onset SMA was assessed in two clinical studies. The infantile-onset SMA study included 21 patients, average age 6.7 months when the study began. After 12 months of treatment, 41% of the patients were able to sit independently for more than 5 seconds. After ≥23 months of treatment, 81% of patients were alive without permanent ventilation. A randomized, placebo-controlled study assessed the drug in patients with later-onset SMA and involved 180 patients aged 2-25 years. Patients taking the drug had an average 1.36 increase in MFM32 (a test of motor function) score at the 1-year mark, compared to a 0.19 decrease in patients on placebo (inactive treatment)… (*FDA*)

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

Effectiveness of Counseling in the Management of Infertile Patients Undergoing Treatment with Assisted Reproductive Technologies

SUNITA CHANDRA*, SUHANI CHANDRA†

ABSTRACT

Background: The objective of this study was to appraise counseling intervention for infertile patients. **Methods:** One hundred sixty-three couples enrolled in the Rajendra Nagar Hospital & IVF Centre, Lucknow, Uttar Pradesh, were asked to participate in this study. Seventy-six couples agreed and were randomized according to a computer-generated random-numbers table into either a routine-care control group or an intervention group. The intervention consisted of three sessions with a counselor: one before, one during and one after the first cycle. **Results:** Significant improvement in the pregnancy rate was observed in the intervention group. **Conclusions:** The results of this study suggest that counseling increases infertile women's chance of becoming pregnant.

Keywords: Stress, distress, effectiveness, counseling, IVF, ART, infertility, pregnancy rates

Two hundred fourteen million women of reproductive age in developing countries who want to avoid pregnancy are not using a modern contraceptive method, still 10-14% of couples suffer from infertility. Infertility is akin to crisis situation, and to any newcomer, the field of assisted reproductive technology (ART) can be confusing and alarming. It could invoke several emotional, spiritual, moral, cultural and ethical issues for the patient. It is possible that the emotional impact of infertility is disregarded and the issue is reduced merely to a biological or medical one. For years altogether, patients have asked for psychosocial support through consumer advocacy organizations, and the same also been suggested by professionals and has been legislated for. Irrespective of a consensus for the need for infertility counseling, patients have largely had to depend on their spouse and family in times of distress, rather than on more formal support resources. There are varied factors that prevent patients from initiating counseling, with the less distressed patients using their existing resources, while the more distressed ones failing to initiate contact with the counseling service possibly because of not knowing how to do so and also due to cost implications.

Evidence estimates an average rate of 20% for uptake of counseling within the field of infertility. A higher uptake has been noted among participants with higher levels of education, and among those from the middle and upper classes as compared to those from lower social classes. When psychosocial infertility counseling is included in fertility treatment, and its goals and course are explained prior to initiation, acceptance rates can be as high as 80%.

Table 1 summarizes a formula to monitor infertility prevalence in women.

Table 1. Monitoring Infertility Prevalence in Women

Numerator: Number of women of reproductive age (15-49 years) at risk of becoming pregnant (not pregnant, sexually active, not using contraception and not lactating) who report trying unsuccessfully for a pregnancy for 2 years or more x 100
Denominator: The number of women of reproductive age (15-49 years) at risk of becoming pregnant (not pregnant, sexually active, not using contraception and not lactating) who report trying for a pregnancy for 2 years or more

Source: World Health Organization. Sexual and reproductive health. Available at: https://www.who.int/reproductivehealth/topics/infertility/burden/en/

*Chairperson and Director
†Consultant
Rajendra Nagar Hospital & IVF Centre, Lucknow, Uttar Pradesh
Address for correspondence
Dr Sunita Chandra
74, Second Street, Rajendra Nagar, Lucknow - 226 004, Uttar Pradesh
Email: drschandra50@gmail.com

With the introduction of ART, such as *in vitro* fertilization (IVF), the need for counselors in fertility clinics was kindled. Counselors possessed the expertise to conduct pre-treatment psychological assessments that were deemed necessary while selecting the most suitable patients to undergo IVF. At the outset, the role of the counselors focused on pre-treatment screening and social workers with experience in pre-adoption assessment and welfare of child issues took care of the same.

The effect of psychological symptoms on fertility continues to be dubious. It is widely recognized that infertility leads to psychological distress, whether distress contributes to infertility is still debatable. Data suggest that psychological issues adversely affect fertility and a decline in such issues could increase pregnancy rate. Studies have reported lower pregnancy rate with elevated anxiety and depression levels. Standard psychological interventions such as counseling could go a long way in helping infertile couples. The need for psychosocial counseling by a skilled professional in order to ensure comprehensive care in ART was first recognized in the 1980s. Latifnejad Roudsari and Allan suggested in their study that infertility is an issue with many sides to it. Therefore, professionals working with infertile couples need to employ a holistic approach such as counseling that covers all psychological, social and cultural needs of individuals.

METHODS

Inclusion Criteria

Study participants had to be infertile women and men or infertile women only. They must be undergoing treatment with ART such as IVF, intracytoplasmic sperm injection (ICSI), embryo transfer (ET) and intrauterine insemination (IUI).

Interventions consisted of counseling as a psychological face-to-face intervention: (i) designed to influence psychological functioning and (ii) incorporating psychological strategies through interaction. The counseling could be provided using different methods (individual, couple or group) in a variety of settings.

Between February 0 and January 0 a total of 8 couples enrolled in the Rajendra Nagar Hospital & IVF Centre, Lucknow, Uttar Pradesh, were asked to participate in this study. Seventy-six agreed and were randomized according to a computer-generated random-numbers table into either a routine-care control group or an intervention group. Reasons for nonparticipation are depicted in Table 2

Study Design

Two groups were prepared by a computer-generated random-numbers table. Thirty-six couples were randomized in a routine-care control group, 37 couples into an intervention group, 3 couples did not turn up. During the first week visit, the record chart was completed daily by the women (baseline) and again daily during their first IVF cycle: depending on the ovarian stimulation protocol used, women started monitoring on either the first day of down-regulation (gonadotropin-releasing hormone [GnRH] agonist long protocol co-treatment) or the first day of ovarian stimulation (mild ovarian stimulation using GnRH antagonist co-treatment). Monitoring ended 2 weeks after the day of the pregnancy test and after the third counseling session. On that same day, all participants completed the stress parameter sheet for the second time. Since previous studies have shown that men experience lower levels of distress during IVF treatment than women, male participants did not fill in the record chart.

Interventions

In the intervention group, couples were given three counseling sessions, ranging from 1 hour to 5 hours. Similar to a previous study, a pre-treatment (1 week before the first day of pituitary down-regulation or the first day of ovarian stimulation in the case of GnRH antagonist co-treatment), and a post-treatment session took place approximately 2 weeks after the day of the pregnancy test. Additionally, patients received a counseling session 6 9 days after the embryo was transferred. The waiting period is associated with more uncertainty and lack of control than other treatment stages. During the nondirective sessions, couples were invited to discuss their feelings and thoughts on topics related to infertility and IVF treatment. Depending

Table 2. Reasons for Nonparticipation

Motivation	n	%
Lack of awareness	30	34.48
No time for counseling	11	12.64
No need for counseling	18	20.69
Fear	19	21.84
Overly stringent protocol	9	10.34

on the needs of the clients, the counselor alternately used the four basic aspects of infertility counseling: information gathering and analysis, implications and decision-making counseling, support counseling and therapeutic counseling. Counseling was provided by a trained counselor. Instead of being an objective observer, the counselor expresses her own feelings and ideas about the client in order to create new interpersonal experiences for the client. It is assumed that through these personal experiences with the counselors, clients learn how to cope with (inter)personal problems.

Outcome Measure

The outcome measure in this study was pregnancy rate, which was measured through β-human chorionic gonadotropin (β-hCG) test, sonography or both of them. The stress appraisal measure (SAM) was developed and monitored at regular interval and analyzed .

RESULTS

Counseling was initiated to all couples as psychological intervention or cognitive-behavioral therapy in which couples received relaxation training, cognitive restructuring, methods for emotional expression and nutrition and exercise information techniques of stress control.

The couples who completed the program differed significantly from the couples who dropped out in demographics and stress as measured by the record chart at baseline. The biochemical pregnancy rate after the first IVF treatment cycle was 35% for the intervention group and 19% for the control group. This difference was significant.

DISCUSSION

Counseling makes an impact through stress reduction mechanism. Distress is associated with a significant reduction in the probability of conception. Counseling could possibly exert a decreasing impact on stress and enhance the possible chance of pregnancy. This conforms with the results from study by Boivin and de Liz and Strauss that investigated the efficacy of psychological interventions for infertile patients.

Psychological interventions include counseling, educational interventions, relaxation and psycho-dynamic or analytic interventions. The beneficial impact of such interventions on pregnancy rates needs to be viewed with caution as there is no clear explanation for this effect.

Sexual activity seems to be disturbed in over half of the couples suffering from infertility. Psychological interventions could have a positive impact on sexual behavior and enhance a couples' chances of pregnancy. An increased rate of sexual intercourse following psychological interventions may be associated with an increased rate of pregnancy.

Most women in this study seemed to be able to cope with the procedural distress of their first IVF treatment with the help of a counselor.

In order to draw an inference, it is required to assess the infertile patient's sexual behavior and their mental distress to determine their relative impact on the pregnancy rate. Future studies should determine the association between a couple's frequency of sexual activity and sexual satisfaction and the pregnancy rates.

Clinical Implications

Counseling should be integrated in the treatment of infertility as the present study indicates that counseling is effective in increasing pregnancy rate.

CONCLUSION

The findings of the present study provide some evidence in support of integrating counseling as an early remedial strategy for infertile patients. Counseling appears to increase infertile women's chances of becoming pregnant. On the basis of the results, counseling is beneficial for infertile patients, but more randomized controlled trials are needed.

Acknowledgments

The authors would like to thank all couples for their participation in this study. We would also like to thank the personnel of the Rajendra Nagar Hospital & IVF Centre, Lucknow, Uttar Pradesh.

This study was funded by the Revolving Fund of the Rajendra Nagar Hospital & IVF Centre, Lucknow, Uttar Pradesh, India.

SUGGESTED READING

1. World Health Organization. Sexual and reproductive health. Available at: https://www.who.int/reproductive health/topics/infertility/burden/en/
2. Furse A. Your Essential Infertility Companion: A User's Guide to Tests, Technology and Therapies. London: Thorsons/Harper Collins; 2011.
3. Aronson D. Resolving Infertility: Understanding the Options and Choosing Solutions When You Want to Have a Baby. New York, NY: Harper Resource; 1999.

4. Recommendations of the French College of Obstetricians and Gynaecologists for the diagnosis, treatment, cost and results of the treatment of infertility in the health services. Hum Reprod. 1992;7(9):1335-7.
5. ESHRE Task Force on Ethics and Law. III. Gamete and embryo donation. Hum Reprod. 2002;17(5):1407-8.
6. The Human Fertilisation and Embryology Authority. In: Code of Practice. 8th Edition, London: HFEA; 2012. Available at: http://www.hfea.gov.uk/docs/ 8th_Code_of_ Practice.pdf.
7. Boivin J, Scanlan LC, Walker SM. Why are infertile patients not using psychosocial counselling? Hum Reprod. 1999;14(5):1384-91.
8. Pepe MV, Byrne T. Women's perceptions of immediate and long-term effects of failed infertility treatment on marital and sexual satisfaction. Family Relations. 1991;40(3): 303-9.
9. Wischmann T, Scherg H, Strowitzki T, Verres R. Psychosocial characteristics of women and men attending infertility counselling. Hum Reprod. 2009;24(2):378-85.
10. Seligman ME. The effectiveness of psychotherapy. The Consumer Reports study. Am Psychol. 1995;50(12):965-74.
11. Emery M, Béran MD, Darwiche J, Oppizzi L, Joris V, Capel R, et al. Results from a prospective, randomized, controlled study evaluating the acceptability and effects of routine pre-IVF counselling. Hum Reprod. 2003;18(12):2647-53.
12. Blyth E, Cameron C. The welfare of the child. An emerging issue in the regulation of assisted conception. Hum Reprod. 1998;13(9):2339-42.
13. Domar AD, Broome A, Zuttermeister PC, Seibel M, Friedman R. The prevalence and predictability of depression in infertile women. Fertil Steril. 1992;58(6): 1158-63.
14. Klonoff-Cohen H, Chu E, Natarajan L, Sieber W. A prospective study of stress among women undergoing in vitro fertilization or gamete intrafallopian transfer. Fertil Steril. 2001;76(4):675-87.
15. Ponjaert-Kristoffersen I, Baetens P. Counselling patients with infertility problems. Int J Adv Counsel. 1999;21: 249-61.
16. Blyth E. Guidelines for infertility counselling in different countries: is there an emerging trend? Hum Reprod. 2012;27(7):2046-57.
17. Latifnejad Roudsari R, Allan HT. Women's experiences and preferences in relation to infertility counselling: A multifaith dialogue. Int J Fertil Steril. 2011;5(3):158-67.
18. de Liz TM, Strauss B. Differential efficacy of group and individual/couple psychotherapy with infertile patients. Hum Reprod. 2005;20(5):1324-32.
19. Hämmerli K, Znoj H, Barth J. The efficacy of psychological interventions for infertile patients: a meta-analysis examining mental health and pregnancy rate. Hum Reprod Update. 2009;15(3):279-95.
20. Wischmann TH. Psychogenic infertility - myths and facts. J Assist Reprod Genet. 2003;20(12):485-94.
21. Roudsari RL, Bidgoli MR. Collaborative infertility counseling and marital satisfaction in infertile females undergoing in-vitro fertilization: A randomized controlled trial. Nurs Midwif Stud. 2017;6:1-7.

■■■■

Hearing Loss Linked with Dementia Pathology

Hearing impairment was associated with neuropathological hallmarks of dementia, revealed an autopsy study published in *Neurology*. In cognitively normal older adults, impaired hearing was found to be associated with tau neurofibrillary degeneration, reported researchers. Additionally, in people with dementia, hearing loss was associated with micro-infarcts but not to tau tangles. In the study, investigators evaluated 3 autopsied participants, 5 years of age and above, from the National Alh eimer's Coordinating Center (NACC) database. About 2% of the participants had impaired hearing. In all, 8 participants were cognitively normal at baseline and 3 had dementia. Among the cognitively normal participants, impaired hearing was shown to be associated with higher Braak stage, but not with other pathologies. In those with dementia, impaired hearing had a positive link with micro-infarcts but an inverse association with neuritic plaque density… (*Medpage Today*)

IMA Urges PM to Intervene to Prevent Doctors' Deaths

New Delhi: Overall, 0 doctors in the country have succumbed to COVID-9 thus far, stated the Indian Medical Association (IMA), as it requested PM Narendra Modi for his attention on this crucial issue. A vast majority of the doctors who have lost their lives due to COVID-9 in India have been general practitioners. According to IMA, India has lost 0 doctors, and of these, 7 were above the age of 6 years. General practitioners constitute around 40% of this number. In Delhi alone, 12 doctors have died due to COVID-19, stated IMA. In a letter to the Prime Minister, the IMA requested the government to ensure that doctors and their families get adequate care, and that the state-sponsored medical and life insurance facilities reach doctors in all the sectors… (*ET Healthworld – TNN*)

Identifying mixed images is a challenge...

So with the mixed infections

In Mixed Skin Infections

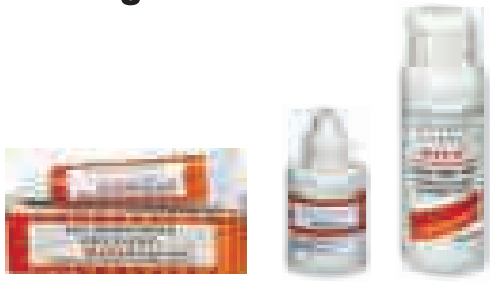
℞ **SURFAZ-SN®** Cream

(Clotrimazole 1% + Beclomethasone Dipropionate 0.025% + Neomycin Sulphate 3500 Units / gm)

For Various Types of Fungal Infections

℞ **SURFAZ®** Cream / Solution / Dusting Powder

(1% Clotrimazole)



In the Management of Superficial and Systemic Fungal Infections

℞ **SURFAZ-O®**

(Fluconazole 150 mg Tablets)

In Fungal Infections with Inflammation

℞ **SURFAZ-B®** Cream

(Clotrimazole 1 % + Beclomethasone Dipropionate 0.025 %)

2020

FRANCO-INDIAN PHARMACEUTICALS PVT. LTD.
20, Dr. E. Moses Road, Mumbai 400 011.

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

Fascia Iliaca Compartment Block in the Emergency Room in Hip Fracture and Shaft of Femur Fractures

ADITYA CHANDRAMOHAN*, PADMAPRAKASH GANDHIRAJ†, ABDUL KHADER‡, JUDE VINOTH#

ABSTRACT

Fascia iliaca block, a well-established method of local anesthesia, is underused in the emergency department. This study aimed at assessing the efficacy, ease of administration by a junior doctor, and the reduction of opioid requirement in patients with fractures of hip and shaft of femur. In this prospective randomized blinded case-control study, 57 patients were randomly assigned into case and control groups to receive 0.25% ropivacaine and 0.9% normal saline (NS) in the fascia iliaca space, respectively, with fentanyl as on demand analgesia titrated to response in both groups. There was a significant difference between the two groups in the visual analog scale between 2 and 6 hours. The reduction in pain score was statistically significant in the case group (from its baseline) compared to the control group (from its baseline). The opioid requirement was also significantly reduced in the case group compared to the control group. The study was effective in demonstrating that fascia iliaca block was successful at reducing the need for opioid analgesia and that it could be performed without much complication by a relatively inexperienced clinician.

Keywords: Fascia iliaca block, hip fracture, fracture of shaft of femur, opioid need, analgesia

The fascia iliaca compartment block was first described by Dalens et al[1] using a landmark technique on children. It is a low-skill method to provide analgesia in patients with pain in the thigh and hip joint. Use of ultrasound can increase the rate of successful blocks. The nervous supply to the leg is through four nerves: sciatic nerve, femoral nerve, obturator nerve and lateral femoral cutaneous nerve, all of which arise from the lumbar and sacral plexus.

Hip fractures are among the common fractures sustained by the elderly. It is difficult for the emergency physician to give adequate analgesia, keeping in mind the multiple comorbidities these patients tend to have. However, analgesia is fast becoming top priority of patients and attendees presenting to the emergency department. It is this need that the present study aims to exploit, assessing the consistency of providing acceptable levels of pain relief for an adequate duration with minimal expertise, minimal side effects and complications.

The procedure followed for this study involves very little expenditure to the patient, is quick to perform and has a smooth learning curve.

The study is based on the hypothesis that use of local analgesia reduces the dose and need for systemic opioids, provides adequate duration of relief for investigative procedures, imaging and until splinting can be done. Good pain relief has been shown to reduce morbidity, duration of hospital stay and improve patient satisfaction. With the majority of hospitals embracing the concept of emergency departments, this procedure will be a useful tool to the budding emergency physician.

MATERIAL AND METHODS

Fifty-seven patients were randomly sorted into either a case or a control group by coin toss method. All patients were given 1 g IV paracetamol as initial analgesia. The patients in the case group were administered 0 mL of 0.25% ropivacaine (max 3 mg/kg) in the fascia iliaca compartment with fentanyl as the rescue drug. The same

*PG Trainee, Dept. of Emergency Medicine
†Consultant In-Charge, ICU
‡Senior Consultant Anesthetist
#Consultant In-Charge, Dept. of Emergency Medicine
Apollo Speciality Hospitals, Madurai, Tamil Nadu
Address for correspondence
Dr Aditya Chandramohan
Apollo Speciality Hospitals, Madurai, Tamil Nadu
E-mil: aditya.chandramohan@gmail.com

was done for patients in the control group replacing the ropivacaine with 0% normal saline (NS). The patient and nurse assessing the pain score were blinded to the agent administered in the fascia iliaca space.

The fascia iliaca block was administered as a blind procedure using the 2 pop technique with a blunt 21 gauge needle. The clinician administering the block were junior doctors after 6 months of training in the emergency department (Having observed at least 5 and assisted in 5 fascia iliaca block administrations).

The statistical analysis was performed by STATA 12 (College Station TX USA). Chi-square test was used to measure the association between diabetes, hypertension, chronic obstructive pulmonary disease (COPD), coronary artery disease (CAD) with treatment groups (Cases and Control), respectively, and is expressed as frequency and percentage. Heart rate, SpO_2, blood pressure and pain score were collected from baseline to 6 hours, Shapiro-Wilk test was used to check the normality. Student's *t*-test was used to find the significance of difference between the age, heart rate, SpO_2, blood pressure, pain score and total fentanyl with treatment groups (Cases and Control), respectively, and these parameters were reported as mean and standard deviation. $P < 0.05$ was considered as statistically significant.

RESULTS

In this study, mean age of patients was 68.23 for the case group and 68.73 for the control group (Fig. 1). Of the 31 patients in the case group, 18 were female. Of the 26 patients in the control group, 13 were female (Fig. 2).

The average pain score at arrival was 7.42 in the case group and 6.73 in the control group. The pain score dropped significantly from 30 minutes to 1 hour. The reduction was more in the case group. The case group also showed a greater drop in pain score in each hour. The drop was sustained for 5 hours after which it started rising (Fig. 3).

Figure 4 gives a better idea of the drop in pain score by measuring the difference, on the visual analog scale (VAS), in pain score at each hour from the baseline. This shows that a significant reduction occurred by 30 minutes to 1 hour. The control group, in contrast, has not shown a major drop in pain score. The difference in pain score from baseline is also much lower in the control group compared to the case group.

The secondary objective of the study was to assess the amount of analgesics required to control the break-through pain. The case group on average required 79 µg

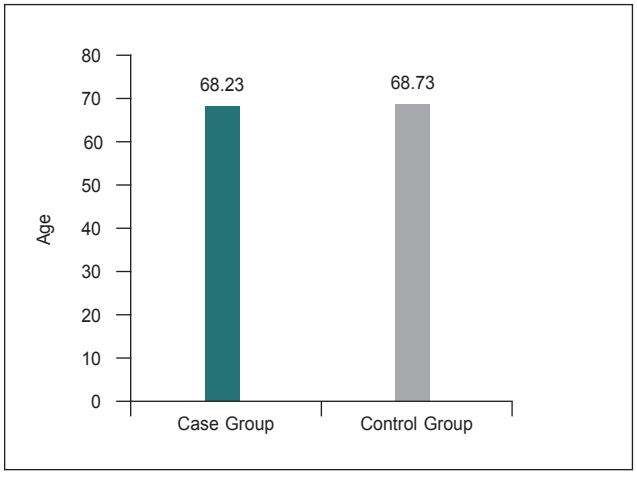


Figure 1. Demographics: Age.

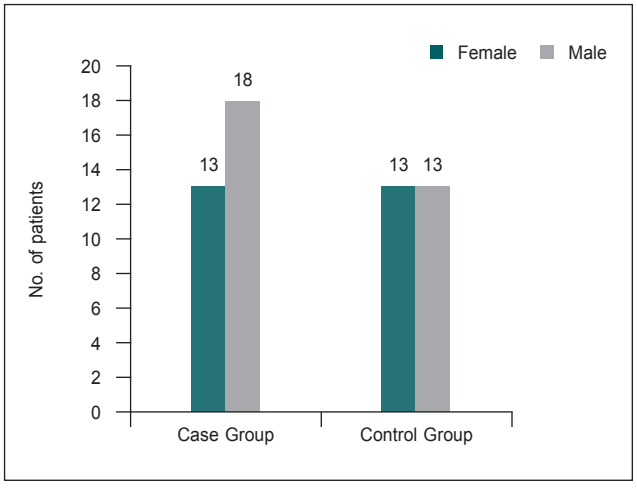


Figure 2. Demographics:G ender.

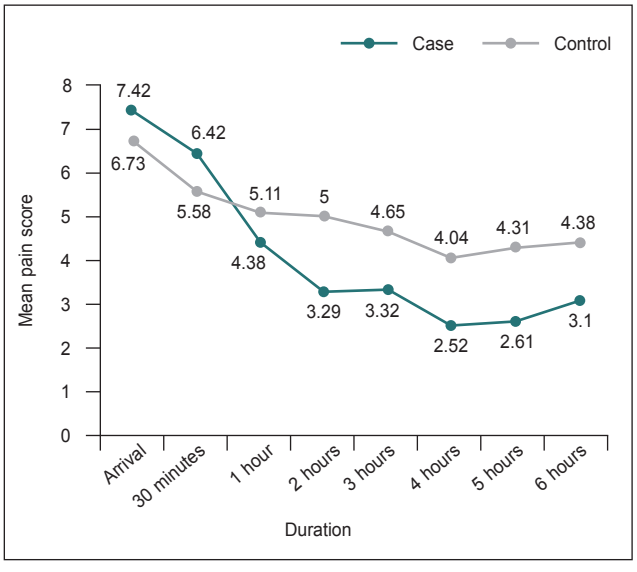


Figure 3. Pain score.

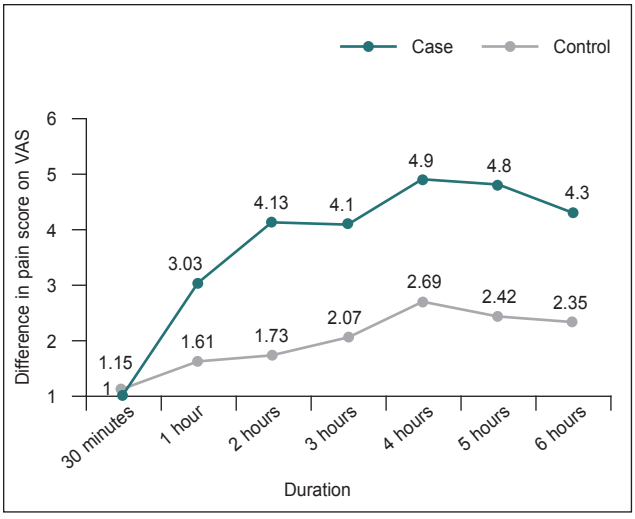


Figure 4. Pain score difference at each hour from baseline.

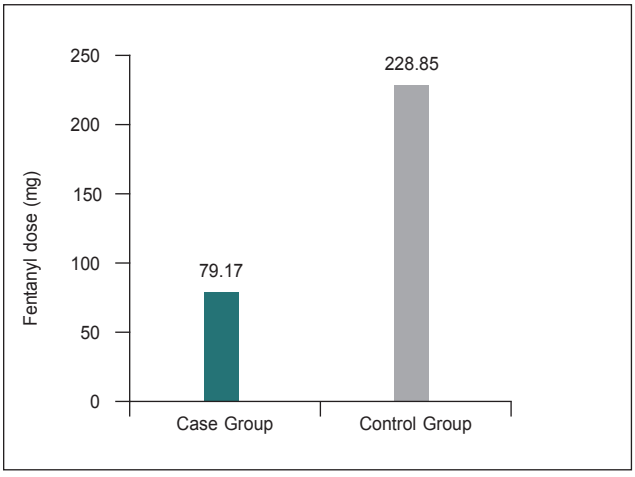


Figure 5. Total fentanyl requirement.

whereas the control group required significantly higher amounts of fentanyl (228 μg) to control the pain (Fig. 5).

DISCUSSION

Fascia iliaca blocks have been studied and practiced in the countries with well-developed emergency and pre-hospital care and worldwide in the operation theater by the anesthetists.

There have been many studies comparing fascia iliaca block with 3 in-1 block, systemic analgesia, etc.

The aim of this study was to assess the efficacy of the fascia iliaca block in the emergency department (ED) in an Indian setup when delivered by a junior resident. The study was done including all junior residents as procedure performing doctors.

The results of this study have been promising with quick onset and acceptable duration of pain relief. The pain relief has been consistent in majority of patients. Very few patients did not respond favorably in terms of pain score.

The study has been relatively inexpensive to the patient while offering considerable and consistent pain relief while in the ED. We would like to compare the results of this study with some of the earlier studies.

In 0 patients with hip fractures, a study found that pain reduced by a pain score of around 3 (by VAS) in 1 hour. It also allowed patients to sit up in bed (hip flexion) with less pain.[2] Our study has a similar onset of pain relief with comparable reduction in pain scores. The degrees of hip flexion post block were not studied in our patients but they were reportedly more comfortable than before, corresponding to the drop in pain score.

A study assessed pre-hospital analgesia with 0 mL of % lignocaine and epinephrine by the fascia iliaca technique. The study was done on 7 patients. Pain relief was assessed by a simplified pain score. Sensory blockade was assessed in the three compartments of the thigh. Fascia iliaca compartment block was found to be an effective method of pre-hospital analgesia for femoral shaft fracture.[3] The results of our study show that adequate relief was obtained with much lower doses of ropivacaine (0 mL of 0% ropivacaine).

In a study assessing fascia iliaca block in the ED, it was performed by the attending ED physician. Investigators reported average pain of 8.5 using the VAS prior to the block. At 15-minute post-injection, it averaged 2.9; at 2-hour post-injection, it averaged 2.3 and at 8-hour post-injection, it averaged 4.4.[4] The onset of relief was much faster and there was a steeper drop in their study compared to ours, which had a more gradual drop. But the duration of relief seems to be comparable; however, our study did not evaluate at the 8-hour mark.

A double-blind placebo-controlled trial was done which used morphine instead of fentanyl and mepivacaine instead of ropivacaine. They also measured pain both at rest and with 5 degrees leg lift.[5] They have reported a lower success rate of around 0% . But the successful blocks had comparable pain relief.

In a study involving a group of 0 patients with intact cognition and isolated hip fractures, ultrasound was used to guide their block placement. The procedure was done by emergency physicians after a short training. They reported a 0% drop in pain score from baseline at 2 hours after block placement.[6] In our study, there was 5 0% drop in pain score at 2 hours.

In a study assessing fascia iliaca block delivered by trained nurses in the ED, 3 patients were included. Thirty milliliters of 0.2% bupivacaine was the agent used to establish the block. Nearly 72% and 92% of the patients, respectively, had pain score ≤4 at 2 hour and 8 hour after the block, while 8% of the patients had that score at 24 hours.[7] Our study had a comparable pain relief at 2 and 6 hours. Our study did not follow the pain score beyond the 6 hour mark.

A study compared fascia iliaca block delivered by blind and ultrasound-guided techniques. Eighty patients posted for unilateral hip or knee joint replacement surgery were randomized into two groups. Both sensory and motor blockade of all three compartments of the thigh were assessed. Investigators found a greater incidence of sensory blockade of the medial compartment, and motor blockade of the femoral and obturator nerves in the group with ultrasound-guided block.[8] Our study did not consider sensory or motor blockade as markers of pain relief. But ultrasound guidance can enhance the rate of successful blockade in the ED.

In a case series of 3 cases who happened to be elderly individuals taking P2Y 12 inhibitors, the patients had sustained a hip fracture and were posted for surgery. Investigators reported that the fascia iliaca block with 20 cc 0.5% ropivacaine + 5 cc 1% mepivacaine when coupled with deep sedation (low-dose propofol infusion) was effective enough for the surgery with no signs of respiratory/hemodynamic instability.[9]

LIMITATIONS

- The study was done in a single center with a limited number of patients.
- Pain score was assessed subjectively with a pain score at rest and no attempt was made to assess it with movement.

CONCLUSION

The fascia iliaca block can be used to effectively deliver anesthesia to patients with hip fractures and proximal femur fractures with few complications. It also brings down the requirement for opioid analgesia.

REFERENCES

1. Dalens B, Vanneuville G, Tanguy A. Comparison of the fascia iliaca compartment block with the 3-in-1 block in children. Anesth Analg. 1989;69(6):705-13.
2. Candal-Couto JJ, McVie JL, Haslam N, Innes AR, Rushmer J. Pre-operative analgesia for patients with femoral neck fractures using a modified fascia iliaca block technique. Injury. 2005;36(4):505-10.
3. Lopez S, Gros T, Bernard N, Plasse C, Capdevila X. Fascia iliaca compartment block for femoral bone fractures in prehospital care. Reg Anesth Pain Med. 2003;28(3):203-7.
4. Monzon DG, Iserson KV, Vazquez JA. Single fascia iliaca compartment block for post-hip fracture pain relief. J Emerg Med. 2007;32(3):257-62.
5. Foss NB, Kristensen BB, Bundgaard M, Bak M, Heiring C, Virkelyst C, et al. Fascia iliaca compartment blockade for acute pain control in hip fracture patients: a randomized, placebo-controlled trial. Anesthesiology. 2007;106(4):773-8.
6. Haines L, Dickman E, Ayvazyan S, Pearl M, Wu S, Rosenblum D, et al. Ultrasound-guided fascia iliaca compartment block for hip fractures in the emergency department. J Emerg Med. 2012;43(4):692-7.
7. Obideyi A, Srikantharajah I, Grigg L, Randall A. Nurse administered fascia iliaca compartment block for pre-operative pain relief in adult fractured neck of femur. Acute Pain. 3 4 5 9
8. Dolan J, Williams A, Murney E, Smith M, Kenny GN. Ultrasound guided fascia iliaca block: a comparison with the loss of resistance technique. Reg Anesth Pain Med. 2008;33(6):526-531.
9. Almeida CR, Francisco EM, Pinho-Oliveira V, Assunção JP. Fascia iliaca block associated only with deep sedation in high-risk patients, taking P2Y12 receptor inhibitors, for intramedullary femoral fixation in intertrochanteric hip fracture: a series of 3 cases. J Clin Anesth. 2016;35:339-45.

■■■■

Malnutrition Tied to Worse Outcomes After Heart Attack

Investigators in a large observational study from Spain have found a strong association between malnutrition and worse outcomes in acute coronary syndrome (ACS). Malnutrition was found to have a significant association with increased risk for all-cause death over a median of 3.6 years after hospitalization for heart attack - Controlling Nutritional Status (CONUT): adjusted HR 2 for moderate malnutrition (9% CI 5 9 and 5 for severe nutrition (9% CI 2 5 ; Nutritional Risk Index (NRI): adjusted HR 0 for moderate malnutrition (9% CI 17 8 and 8 for severe nutrition (9% CI 7 9 ; Prognostic Nutritional Index (PNI): adjusted HR 7 for moderate malnutrition (95% CI 1.37-2.15) and 1.95 for severe nutrition (95% CI 1.55-2.45). The findings were published in the *Journal of the American College of Cardiology…* (*Medpage Today*)

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

Gender-related Difference in Socioeconomic and Behavioral Factor in Relation to BP and BMI of Type 2 Diabetic Workers from Match Factories and Fireworks in Sivakasi, Tamil Nadu

V PRIYA*, MAZHER SULTANA*, BABUJI†, KAMARAJ†

ABSTRACT

Objective: The prevalence of diabetes has been steadily increasing in workers of Match factories and Fireworks in Sivakasi area. We investigated the difference between male and female diabetic patients in terms of impact of socioeconomic, behavioral and other risk factors like blood pressure (BP) and body mass index (BMI). **Methods:** Total 112 persons (64 male and 48 female) with type 2 diabetes were selected for this study, from various hospitals situated in Sivakasi area. Socioeconomic status (SES) and other behavioral factors were ascertained by physical examination and interview. **Result:** There was significant difference between male and female diabetics only in certain factors. SES was found significant and inversely related to physical activity, marital status, food habit, duration and systolic blood pressure (SBP) in female diabetics. In male, these association were weaker or absent, when education level was considered. But in income level, significant differences were found in SBP and detected age. Statistical significance was found between behavioral and other risk factors in both male and female diabetics. **Conclusion:** Physical inactivity leads to high BMI and increased SBP. Due to lack of knowledge, these diabetic patients did not avail any type of medical attention for treating diabetes till they got other complications due to untreated diabetes.

Keywords: Prevalence of diabetes, blood pressure, body mass index, socioeconomic status, physical inactivity, smoking, alcohol intake

Diabetes prevalence is increasing in all population groups in India, but this increase seems to be greater in lower socioeconomic level people. The prevalence of type 2 diabetes has been reported more in fireworks and match factory workers in Sivakasi area. Socioeconomic status (SES) which plays an important role in healthcare and disease prevention, is a complex indicator of health services accessibility, knowledge of health promotion, willingness to seek treatment and lifestyle behavior (Mei Tang 2 0 .

Educational attainments and income adequacy are important indicators of SES. Low SES tends to be associated with a high prevalence of diabetes in developed countries (Evans et al 2 Robbins et al 2 Connolly et al 2 . Obesity, physical inactivity, smoking and alcohol intake are implicated in the development of type 2 diabetes and are also associated with low socioeconomic position (Emilie et al 2 .

Research suggests an association between low SES and high blood pressure (BP), although this association is not consistent. A study on smoking, alcohol consumption and body mass index (BMI) reveals that the lifestyle increases the risk of high BP. And it is more common among people with low SES (Mathews et al 9 Lynch et al 9 Porton et al 9 Dyer et al 9 . Diagnostic and treatment services for high BP may be more accessible to people with high SES (Bunker et al 9 Hoddard et al 9 .

The health impact of SES and behavioral factors may not be the same in male and female. Only a few studies have assessed sex difference in the relationship between SES and diabetes. The pathway by which SES may differently affect the development of type 2 diabetes in male and female is unclear. The impact of behavioral factors like BMI, physical inactivity, smoking, alcohol consumption and family history of diabetes are closely linked with insulin resistance. But the variation of BP

*Presidency College, Chennai, Tamil Nadu
†Kani Lakshmi Clinic, Sivakasi, Tamil Nadu

in SES and behavioral factors has rarely been studied. So, the aim of the study was to assess the sex-specific association of SES, behavioral factor and the difference in BP and BMI with diagnosed type 2 diabetic workers from match factories and fireworks in Sivakasi area.

METHOD

Area

This study was carried out on workers working in match factories and fireworks in Sivakasi area. Sivakasi is situated in Virudhunagar district, Tamil Nadu state, India. This place is very dry and is ideally suited for the manufacturing of fireworks, printed materials, paper and the match factories. About 9 match factories are situated in and around Sivakasi area. Around 9 persons are directly employed in these factories.

Participants

For this present study, 2 individuals (4 male and 8 female) were enrolled from various hospitals situated in Sivakasi area. The participants were interviewed and completed questionnaires on SES and behavioral characters were collected.

Socioeconomic Variables

Information on educational attainment was divided into primary (Class 1 5 , secondary (Class 6 0 and higher (9 h class) education and income was divided in low (< ₹ 9 , medium (₹ 9 to ₹ 9 and higher level (> ₹ 9 .

Behavioral Variables

Body weight was measured in light clothing in kg and height was measured in centimeters. BMI was calculated by weight in kg divided by square of height in meters. BP was measured in a sitting position for 2 times at the right arm after 5 minutes rest using sphygmomanometer by a well-trained nurse. All subjects were interviewed and asked about their physical activity. It was divided into 'active' and 'inactive'. Alcohol drinking habit was categorized as 'alcoholic' and 'nonalcoholic'. Cigarette smoking habit was divided into 'smokers' and 'nonsmokers'. Their family history about diabetes was analyzed and grouped into FH+ and FH-. Their age, diabetes detected age and duration were also asked during interview.

Laboratory Measurement

Plasma glucose was measured using an enzymatic method by using ready made kits manufactured by Prison Diagnostic Pvt. Ltd, Mumbai.

Table 1. Socioeconomic, Behavioral and Other Risk Factors Among Males and Females

Factor	Male	Female	P value
Age (years)			
Mean	51.13	48.77	0.23
SD	10.17	10.10	
Diabetes detected age (years)			
Mean	47.48	44.88	0.17
SD	9.62	9.91	
Duration (years)			
Mean	3.67	3.92	0.62
SD	2.37	2.67	
SBP (mmHg)			
Mean	132.53	131.29	0.58
SD	12.70	10.82	
DBP (mmHg)			
Mean	80.03	79.23	0.57
SD	8.09	6.84	
Plasma glucose (mg/dL)			
Mean	170.02	172.83	0.72
SD	39.78	42.61	
BMI (kg/m²)			
Mean	26.59	25.38	0.0086
SD	1.99	2.60	
Marital status			
Married (%)	89.06	81.25	0.24
Single/Widow (%)	10.94	18.75	
Food habit			
NV (%)	81.25	70.83	0.196
Veg (%)	18.75	29.17	
Physically			
Inactive (%)	31.25	43.75	0.174
Active (%)	68.75	56.25	
Smoking habit			
Smoker (%)	43.75	0	
Nonsmoker (%)	56.25	100	0.000
Alcohol intake			
Alcoholic (%)	45.31	0	
Nonalcoholic (%)	54.69	100	0.000
Family history of diabetes			
FH+ (%)	76.56	70.83	
FH- (%)	23.44	29.17	0.49
Education			
Primary (%)	25.00	60.42	0.0008
Secondary (%)	56.25	29.17	
Higher (%)	18.75	10.42	
Income			
Low (%)	28.13	54.17	0.02
Medium (%)	37.50	25.00	
High (%)	34.37	20.83	

FH+ = Family history of diabetes present; FH- = Family history of diabetes absent; NV = Nonvegetarian; SBP = Systolic blood pressure; DBP = Diastolic blood pressure.

Statistical Analysis

Analysis was carried out separately for males and females using Systat 12 (2007) statistical software. Descriptive analyses were obtained for all variables and differences between males and females were assessed using '*t*' test, X^2 tests and ANOVA. Sex differences in SES indicators were evaluated using linear or logistic regression models including original SES variables. Means (standard deviation [SD]) for normal distribution and means for log normal distributed continuous variables or proportions for categorical variables were calculated among the SES groups.

RESULT

Socioeconomical, behavioral and other risk factors among male and female participants are shown in Table 1 Systolic BP (SBP), diastolic BP (DBP) and BMI were higher and blood sugar was lower among males than females. Physical inactivity was more in female compared to males. Smoking and alcohol intake was

Table 2a. The Distribution of Risk Factor of Type 2 Diabetes by SES in Men

Factor	Education				Income			P value
	Primary	Secondary	Higher	P value	Low	Medium	High	
Marital status								
Married (%)	75.00	94.44	91.67	0.11	83.33	83.33	100	0.127
Single (%)	25.00	5.55	8.33		16.67	16.67	--	
Food habit								
NV (%)	93.75	75.00	83.33	0.27	72.22	83.33	86.36	0.49
Veg (%)	6.25	25.00	16.67		27.78	16.67	13.64	
Physically								
Active (%)	62.50	66.67	83.33	0.46	16.67	79.17	100	0.000
Inactive (%)	37.50	33.33	16.67		83.33	20.83	--	
Smoking habit								
Smoker (%)	43.75	44.44	41.67	0.98	38.89	45.83	45.45	0.88
Nonsmoker (%)	56.25	55.56	58.33		61.11	54.17	54.55	
Alcohol intake								
Alcoholic (%)	37.50	47.22	50.00	0.76	38.89	45.83	50.00	0.77
Nonalcoholic (%)	62.50	52.78	50.00		61.11	54.17	50.00	
Family history of diabetes								
FH+ (%)	6.25	30.56	25.00	0.16	27.78	16.67	27.27	0.61
FH- (%)	93.75	69.44	75.00		72.22	83.33	72.73	
SBP (mmHg)								
Mean	137.00	130.39	133.00	NS	139.67	133.58	125.55	**
SD	13.06	13.19	9.67		11.19	11.72	11.66	
DBP (mmHg)								
Mean	81.75	78.94	81.00	NS	83.11	81.00	76.45	**
SD	9.18	7.61	8.16		7.36	8.89	6.59	
Plasma glucose (mg/dL)								
Mean	166.94	174.97	159.25	NS	167.61	173.33	168.36	NS
SD	48.99	35.79	38.66		33.39	42.59	42.88	
BMI (kg/m²)								
Mean	26.94	26.43	26.61	NS	27.70	26.73	25.23	NS
SD	1.59	2.06	2.34		2.24	1.73	1.52	
Detected age (years)								
Mean	48.94	46.44	48.67	NS	54.11	46.00	43.68	**
SD	9.46	9.67	10.11		9.37	8.80	8.15	
Duration (years)								
Mean	3.56	3.67	3.83	NS	4.39	3.63	3.14	NS
SD	2.34	2.53	2.08		2.64	2.64	1.69	

NS = No significance; **Significance $p < 0.01$.

found only in males. Nonvegetarians were more in males ( ) compared to females ( ). Family history of diabetes was seen more in males than females. Significant difference was found in income (p = 0.02) and educational status (p = 0.0008) between male and female subjects. The age at which the diabetes detected was high in males (years) and low in females (years).

The distributions of various risk factors by SES are shown in Table 2a and . In patients with secondary education level, more male ( ) members were found married than female ( ). In male diabetics with primary education level number of singles or widows was high. But for female diabetics number of single or widows was high in higher education level. There was significant difference in education level and marital status among female diabetics (p = 0.03).

Most of the male nonvegetarians were found in primary education group. But female nonvegetarians were more in secondary education group. While comparing income level, there was no significant difference noticed in male food habits. But in females, there was a significant difference (p = 0.06). Physical inactivity was

Table 2b. The Distribution of Risk Factor of Type 2 Diabetes by SES in Women

Factor	Primary	Secondary	Higher	P value	Low	Medium	High	P value
Marital status								
Married (%)	82.76	92.86	40.00	0.03	76.92	83.33	90.00	0.65
Single (%)	17.24	7.14	60.00		23.08	16.67	10.00	
Food habit								
NV (%)	68.97	78.57	60.00	0.69	84.62	58.33	50.00	0.067
Veg (%)	31.03	21.43	40.00		15.38	41.67	50.00	
Physically								
Active (%)	37.93	78.57	100.00	0.004	30.46	75.00	80.00	0.025
Inactive (%)	62.07	21.43	--		61.54	25.00	20.00	
Smoking habit								
Smoker (%)	0	0	0	0.0001	0	0	0	0.008
Nonsmoker (%)	100	100	100		100	100	100	
Alcohol intake								
Alcoholic (%)	0	0	0	0.0001	0	0	0	0.008
Nonalcoholic (%)	100	100	100		100	100	100	
Family history								
FH+ (%)	20.69	42.86	40.00	0.28	26.92	33.33	30.00	0.92
FH- (%)	79.31	57.14	60.00		73.08	66.67	70.00	
SBP (mmHg)								
Mean	134.41	128.29	121.60	**	133.92	129.33	126.80	NS
SD	9.01	12.19	10.14		11.01	8.06	12.15	
DBP (mmHg)								
Mean	80.45	78.29	74.80	**	80.27	76.33	80.00	NS
SD	7.16	6.27	5.02		7.41	6.14	5.58	
Plasma glucose (mg/dL)								
Mean	170.79	177.36	172.00	NS	178.00	161.08	173.50	NS
SD	40.89	51.08	32.33		38.22	49.62	46.38	
BMI (kg/m²)								
Mean	26.00	24.71	23.64	NS	25.68	25.39	24.58	NS
SD	2.78	2.05	1.92		2.99	2.26	1.84	
Detected age (years)								
Mean	45.97	43.86	41.40	NS	46.31	42.92	43.5	NS
SD	10.38	8.58	11.46		11.61	9.13	7.15	
Duration (years)								
Mean	4.28	3.79	2.20	***	3.96	3.83	3.90	NS
SD	3.17	1.58	0.84		3.21	1.69	2.28	

NS = No significance; **Significance $p < 0.01$; ***$p < 0.001$.

Table 3a. The Relationship Between Behavioral and Other Risk Factors in Male

Factor	Food habit			Smoker			Alcohol			Physically		P value
	Nonveg	Veg	P value	Yes	No	P value	Yes	No	P value	Inactive	Active	
Family history												
FH+ (%)	21.15	33.33	0.37	25.00	22.22	0.79	31.03	17.14	0.19	70.00	79.55	0.40
FH- (%)	78.85	66.67		75.00	77.78		68.97	82.86		30.00	20.45	
Marital status												
Married (%)	90.38	83.33	0.48	96.43	83.33	0.09	100.0	80.00	0.01	85.00	90.91	0.48
Single (%)	9.62	16.67		3.57	16.67			20.00		15.00	9.09	
SBP (mmHg)												
Mean	131.8	135.5	0.29	135.0	130.6	0.15	134.0	131.2	0.37	138.9	129.6	0.004
SD	13.22	10.06		8.83	14.88		110.1	13.98		10.53	12.64	
DBP (mmHg)												
Mean	80.08	79.83	0.94	81.07	79.22	0.38	81.59	78.74	0.16	81.30	79.45	0.43
SD	7.74	9.85		8.70	7.61		8.20	7.88		8.81	7.78	
Plasma glucose (mg/dL)												
Mean	168.7	175.5	0.59	171.8	168.5	0.74	176.7	164.4	0.21	164.3	172.6	0.43
SD	40.36	38.36		35.02	43.57		30.08	40.83		38.19	40.65	
BMI (kg/m²)												
Mean	26.43	27.29	0.22	27.23	26.09	0.01	26.72	26.48	0.63	27.79	26.05	0.001
SD	1.93	2.18		1.36	2.26		1.80	2.15		1.87	1.81	
Detected age (years)												
Mean	46.50	51.75	0.07	47.36	47.58	0.92	47.24	47.69	0.85	55.05	44.05	0.000
SD	9.69	8.38		8.17	10.73		8.83	10.35		5.19	9.22	

Table 3b. The Relationship Between Behavioral and Other Risk Factors in Female

Factor	Food habit			Smoker	Alcoholic	Physically		P value
	Nonveg	Veg	P value	No	No	Inactive	Active	
Family history								
FH+ (%)	29.41	28.57	0.95	29.17	29.17	19.05	37.04	0.17
FH- (%)	70.59	71.43		70.83	70.83	80.95	62.96	
Marital status								
Married (%)	76.47	92.86	0.19	81.25	81.25	76.19	85.19	0.43
Single (%)	23.53	7.14		18.75	18.75	23.81	14.82	
SBP (mmHg)								
Mean	132.8	127.5	0.13	131.2	131.2	136.5	127.1	0.001
SD	10.72	10.50		10.82	10.82	8.42	10.82	
DBP (mmHg)								
Mean	79.38	78.86	0.82	79.23	79.23	79.86	78.74	0.58
SD	6.77	7.26		6.84	6.84	7.21	6.64	
Plasma glucose (mg/dL)								
Mean	170.2	179.2	0.53	172.8	172.8	168.48	176.2	0.53
SD	41.56	46.01		42.61	42.61	38.72	45.83	
BMI (kg/m²)								
Mean	25.49	25.12	0.61	25.38	25.38	26.46	24.54	0.01
SD	2.80	1.93		2.60	2.60	2.86	2.07	
Detected age (years)								
Mean	44.44	45.93	0.54	44.88	44.88	51.33	39.85	0.000
SD	11.33	5.21		9.91	9.91	5.33	9.78	

high in primary education level and low-income group in both males and females. But, there was significant difference in education level (p = 0.004) and income level (p = 0.02) in females. In males, smoking habit was high in secondary education level with medium income. And there was no smoking habit among female of any education and income level. Alcohol intake was high in higher education level and high-income level male.

Family history of diabetes reported high among both male (8%) and female (8%) with secondary education and no significant association found in income groups.

SBP was more in primary educated (7 mmHg) and lower income level (9 mmHg) males. Also similar trend was found in female diabetics. There was statistical significance found in diastolic pressure in males at income level and female at education levels.

Plasma glucose level was high in both male (174.9 mg/dL) and female (177.3 mg/dL) subjects with secondary education level. Male (173.3 mg/dL) diabetics with medium income and female (178 mg/dL) diabetics in lower income level had high glucose level. Male diabetics in lower income level had high BMI (27.7 kg/m²). But female diabetics with primary education level had high BMI (26 kg/m²).

Diabetes detected age was high among male diabetics (5 years) and low among female diabetics (4 years) who were in low income level. And diabetes was detected very early in both the males and females in high-income level.

Table 3 and 5 shows the relation between behavioral factors and other risk factors. Among male diabetics, significant association was found between marital status and smoking habit (p = 0.09). Systolic pressure in male diabetics was more in vegetarians (5 mmHg), smokers (5 mmHg), alcoholic (4 mmHg) and physically inactive (8 mmHg). But, there was statistical significance found only in physical activity and SBP (p = 0.003). In male diabetics, plasma glucose was more in vegetarians (175.58 mg/dL), smokers (171.86 mg/dL) and alcoholic (176 mg/dL). BMI was also more in vegetarians (27.2 kg/m²), smokers (27.23 kg/m²) and physically inactive (27.79 kg/m²) males. But, BMI showed statistical significance between smokers and nonsmokers (p = 0.015) and physically active and inactive (p = 0.01) males.

In female diabetics, SBP was high in nonvegetarians (8 mmHg) and physically inactive (8 mmHg). Statistical significance (p = 0.01) was found between physical activity and SBP in females. Plasma glucose was found more in vegetarians (179.21 mg/dL) and physically active (176.22 mg/dL) females. In female diabetics, BMI showed significance (p = 0.01) with physical activity, it was more (26.46 kg/m²) in case of physically inactive females. Duration of diabetes shows significant difference between physical active and inactive females (p = 0.02).

DISCUSSION

This study shows that there is significant difference between male and female diabetics only in certain factors. In the third National Health and Nutrition Examination Survey (2001), SES was significantly associated with type 2 diabetes in both African-American and white women. But, no relationship was found for men. Rathmann et al (9 found that patients with long-standing diabetes along with severe disabling diabetic complication and poor health may result in low SES. According to Tang et al (9 in the National Population Health Survey in Canada, low-income and education remained significantly associated with self-reported diabetes after controlling for BMI and physical activity in women. In men, the association was weaker and did not persist after controlling for risk factors. In the present study, there was significant difference in male only in few factors and SES. But, female showed significant inverse association with SES. This study reveals BMI was more among low-income level male diabetics. Poor diet, lack of physical activity and smoking habit had led to increase in BMI of these diabetic cases. Female diabetics in primary education level have more BMI. Lack of knowledge, consumption of junk food and sedentary lifestyle have increased the BMI of female diabetics. The association between SES and obesity was found in several studies, obesity being stronger in women than in men. Rathman et al (9 analyzed that an inverse association of BMI and SES was found only in women. Ramachandran et al (9 found that obesity is common in Indians and the adverse effect of central obesity is manifested in increasing tertiles of BMI both in men and women. BMI was found more in Indian women.

Physical inactivity is another major behavioral risk factor of type 2 diabetes. Lantz et al (1998) found in US adults that physical activity was less in low SES groups. Ford et al found women with higher SES were more physically active than women with low SES; whereas this social gradient may be less pronounced in men. Rathman et al (9 in KORA survey proved that physical inactivity was reported more in men and women in low SES. In the present study, physical inactivity was

high among both male and female diabetics who were in low-income level. Physically inactive female were more in low education level. Normally well-educated and those who earn more are more likely to engage in high physical activity. Mathews et al (9) identified people with high occupational status and in particular high education attainments were less likely to smoke and drink excess alcohol. Study conducted in Canada showed that lower income was inversely associated with smoking and diet intake. But in this present study, there was no difference in smoking habit between education level and income level in males. Alcohol intake was more in higher income group. Because of more work, stress, body pain and work tension they may resort to take alcohol.

Kivimaki et al (2004) identified that there was a weak inverse relationship between SES and BP. Higher education attainment was associated with lower SBP. But association involving occupational status and DBP did not reach statistical significance. Stronger links with lifestyle and risk factor may partially explain the greater BP differences between educational levels and occupational status.

Marmot et al (10) in the Whitehall study found difference in SBP was no more than 3-5 mmHg between the highest and lowest employment grade. In the INTER-SALT study, Stamler (12) proved an inverse association between years of education and BP. The US Hanes III study showed no association between SES and BP. In this present study, SBP was more in primary education and low-income level in both males and females. Tension, worry about the uncertainty in life, work pressure and poor diet regulation may increase the BMI. Previous researches consistently showed a positive relationship between body weight and BP. Increased BMI was the predictor of higher BP.

Hoskins et al found that a family history of diabetes was a risk factor for diabetes in Melanesians and Indians living in Fiji. Ramachandran et al (8) reported a high prevalence of diabetes among Indian children who had one or two diabetic parents. But in the present study, there was no significant difference in family history of diabetes and SES between males and females.

This study shows low-income male diabetic had longer duration of diabetes and diabetes detected age was also higher. Even in female diabetics, primary education group had diabetes over long duration and the detected age was high. Due to poverty and lack of knowledge, these diabetic patients were not aware of the free healthcare facilities and never tried to avail any type of medical attention for treating diabetes, till they got complication due to prolonged untreated diabetes.

In conclusion, in female diabetics SES was found to be significantly and inversely related to physical activity, marital status, food habit, duration and SBP. In males, these association were weaker or absent when education level was considered. But in income level, significant differences were found in SBP and detected age. Significant differences were found in both male and female behavioral characters and other risk factors like SBP and BMI. Physical inactivity leads to high BMI and it increases SBP. But, the differences between male and female diabetic patients need to be further investigated.

Acknowledgment

We thank Mr Ramadas, Mr Navaneethan and Mrs Asha for the help they extended while collecting the samples. Also we thank Mr Ponmurugan for the statistical and secretarial help.

SUGGESTED READING

1. Adler NE, Boyce WT, Chesney MA, Folkman S, Syme SL. Socioeconomic inequalities in health. No easy solution. JAMA. 1993;269(24):3140-5.
2. Ramachandran A, Jali MV, Mohan V, Snehalatha C, Viswanathan M. High prevalence of diabetes in an urban population in south India. BMJ. 1988;297(6648):587-90.
3. Brown AF, Ettner SL, Piette J, Weinberger M, Gregg E, Shapiro MF, et al. Socioeconomic position and health among persons with diabetes mellitus: a conceptual framework and review of the literature. Epidemiol Rev. 2004;26:63-77.
4. Connolly V, Unwin N, Sherriff P, Bilous R, Kelly W. Diabetes prevalence and socioeconomic status: a population based study showing increased prevalence of type 2 diabetes mellitus in deprived areas. J Epidemiol Community Health. 2000;54(3):173-7.
5. Choi BC, Shi F. Risk factors for diabetes mellitus by age and sex: results of the National Population Health Survey. Diabetologia. 2001;44(10):1221-31.
6. Dyer AR, Liu K, Walsh M, Kiefe C, Jacobs DR Jr, Bild DE. Ten-year incidence of elevated blood pressure and its predictors: the CARDIA study. Coronary Artery Risk Development in (Young) Adults. J Hum Hypertens. 1999;13(1):13-21.
7. Agardh EE, Ahlbom A, Andersson T, Efendic S, Grill V, Hallqvist J, et al. Explanations of socioeconomic differences in excess risk of type 2 diabetes in Swedish men and women. Diabetes Care. 2004;27(3):716-21.
8. Evans JM, Newton RW, Ruta DA, MacDonald TM, Morris AD. Socio-economic status, obesity and prevalence of Type 1 and Type 2 diabetes mellitus. Diabet Med. 2000;17(6):478-80.

9. Brancati FL, Kao WH, Folsom AR, Watson RL, Szklo M. Incident type 2 diabetes mellitus in African American and white adults: the Atherosclerosis Risk in Communities Study. JAMA. 2000;283(17):2253-9.
10. House JS, Lepkowski JM, Kinney AM, Mero RP, Kessler RC, Herzog AR. The social stratification of aging and health. J Health Soc Behav. 1994;35(3):213-34.
11. House JS, Kessler RC, Herzog AR. Age, socioeconomic status, and health. Milbank Q. 1990;68(3):383-411.
12. Ismail AA, Beeching NJ, Gill GV, Bellis MA. Capture-recapture-adjusted prevalence rates of type 2 diabetes are related to social deprivation. QJM. 1999;92(12):707-10.
13. Lynch JW, Kaplan GA, Salonen JT. Why do poor people behave poorly? Variation in adult health behaviours and psychosocial characteristics by stages of the socioeconomic life course. Soc Sci Med. 1997;44(6):809-19.
14. Lantz PM, House JS, Lepkowski JM, Williams DR, Mero RP, Chen J. Socioeconomic factors, health behaviors, and mortality: results from a nationally representative prospective study of US adults. JAMA. 1998;279(21):: 1703-8.
15. Tang M, Chen Y, Krewski D. Gender-related differences in the association between socioeconomic status and self-reported diabetes. Int J Epidemiol. 2003;32(3):381-5.
16. Kivimäki M, Kinnunen ML, Pitkänen T, Vahtera J, Elovainio M, Pulkkinen L. Contribution of early and adult factors to socioeconomic variation in blood pressure: thirty-four-year follow-up study of school children. Psychosom Med. 2004;66(2):184-9.
17. Power C, Matthews S. Origins of health inequalities in a national population sample. Lancet. 1997;350(9091):1584-9.
18. Poston WS 2nd, Foreyt JP. Obesity is an environmental issue. Atherosclerosis. 1999;146(2):201-9.
19. Robbins JM, Vaccarino V, Zhang H, Kasl SV. Socioeconomic status and type 2 diabetes in African American and non-Hispanic white women and men: evidence from the Third National Health and Nutrition Examination Survey. Am J Public Health. 2001;91(1):76-83.
20. Stamler R, Shipley M, Elliott P, Dyer A, Sans S, Stamler J. Higher blood pressure in adults with less education. Some explanations from INTERSALT. Hypertension. 1992;19(3):237-41.
21. Shah SK, Saikia M, Burman NN, Snehalatha C, Ramachandran A. High prevalence of type 2 diabetes in urban population in north eastern India. Int J Diabetes Dev Countries. 1999;19:144-7.
22. Maty SC, Everson-Rose SA, Haan MN, Raghunathan TE, Kaplan GA. Education, income, occupation, and the 34-year incidence (1965-99) of Type 2 diabetes in the Alameda County Study. Int J Epidemiol. 2005;34(6):1274-81.
23. Gary TL, Brancati FL. Commentary: socioeconomic position and the risk of type 2 diabetes. Int J Epidemiol. 2005;34(6):1282-3.
24. Rathmann W, Haastert B, Icks A, Giani G, Holle R, Meisinger C et al; KORA Study Group. Sex differences in the associations of socioeconomic status with undiagnosed diabetes mellitus and impaired glucose tolerance in the elderly population: the KORA Survey 2000. Eur J Public Health. 2005;15(6):627-33.
25. Williams DR. Socioeconomic differentials in health: a review and redirection. Soc Psychol Q. 1990;53(2):81-99.

■■■■

New Zealand Reaches 100 Days Mark without Domestic Virus Case

Wellington - New Zealand recorded 100 days without domestic transmission of the coronavirus on 9th August. However, people were cautioned against complacency as countries like Vietnam and Australia, where the virus was once under control, are now fighting a resurgence.

The country has 23 active cases in isolation facilities, and 2 COVID-19 cases in total, so far. While people in the country have returned to normal life, authorities are concerned that people were not getting testing done, not using the government contact tracing apps, and were even ignoring hygiene rules. Director-General of Health, Dr Ashley Bloomfield has stated that attaining 100 days without community transmission represents a significant milestone; however, it won't be correct to be complacent at this time… (*Reuters*)

Multisystem Inflammatory Syndrome Linked to COVID-19 Found in Around 600 US Children, Says CDC

Around 600 children were admitted to US hospitals with a rare inflammatory syndrome - Multisystem inflammatory syndrome in children (MIS-C)-associated with COVID-19, over a period of 4 months during the peak of the pandemic, states a CDC report.

This severe condition has symptoms like those of toxic shock and Kawasaki disease, including fever, rashes, swollen glands and, in severe cases, heart inflammation. The condition has been observed in children and adolescent patients about 2-4 weeks after the onset of COVID-19. Among the cases, all patients tested positive for COVID-19 and 10 have died, reported the CDC… (*HT*)

Every citizen of India should have the right to accessible, affordable, quality and safe heart care irrespective of his/her economical background

Sameer Malik Heart Care Foundation Fund

An Initiative of Heart Care Foundation of India

E-219, Greater Kailash, Part I, New Delhi - 110048 E-mail: heartcarefoundationfund@gmail.com Helpline Number: +91 - 9958771177

"No one should die of heart disease just because he/she cannot afford it"

About Sameer Malik Heart Care Foundation Fund

"Sameer Malik Heart Care Foundation Fund" it is an initiative of the Heart Care Foundation of India created with an objective to cater to the heart care needs of people.

Objectives

- Assist heart patients belonging to economically weaker sections of the society in getting affordable and quality treatment.
- Raise awareness about the fundamental right of individuals to medical treatment irrespective of their religion or economical background.
- Sensitize the central and state government about the need for a National Cardiovascular Disease Control Program.
- Encourage and involve key stakeholders such as other NGOs, private institutions and individual to help reduce the number of deaths due to heart disease in the country.
- To promote heart care research in India.
- To promote and train hands-only CPR.

Activities of the Fund

Financial Assistance

Financial assistance is given to eligible non emergent heart patients. Apart from its own resources, the fund raises money through donations, aid from individuals, organizations, professional bodies, associations and other philanthropic organizations, etc.

After the sanction of grant, the fund members facilitate the patient in getting his/her heart intervention done at state of art heart hospitals in Delhi NCR like Medanta – The Medicity, National Heart Institute, All India Institute of Medical Sciences (AIIMS), RML Hospital, GB Pant Hospital, Jaipur Golden Hospital, etc. The money is transferred directly to the concerned hospital where surgery is to be done.

Drug Subsidy

The HCFI Fund has tied up with Helpline Pharmacy in Delhi to facilitate patients with medicines at highly discounted rates (up to 50%) post surgery.

The HCFI Fund has also tied up for providing up to 50% discount on imaging (CT, MR, CT angiography, etc.)

Who is Eligible?

All heart patients who need pacemakers, valve replacement, bypass surgery, surgery for congenital heart diseases, etc. are eligible to apply for assistance from the Fund. The Application form can be downloaded from the website of the Fund. http://heartcarefoundationfund.heartcarefoundation.org and submitted in the HCFI Fund office.

Important Notes

- The patient must be a citizen of India with valid Voter ID Card/ Aadhaar Card/Driving License.
- The patient must be needy and underprivileged, to be assessed by Fund Committee.
- The HCFI Fund reserves the right to accept/reject any application for financial assistance without assigning any reasons thereof.
- The review of applications may take 4-6 weeks.
- All applications are judged on merit by a Medical Advisory Board who meet every Tuesday and decide on the acceptance/rejection of applications.
- The HCFI Fund is not responsible for failure of treatment/death of patient during or after the treatment has been rendered to the patient at designated hospitals.
- The HCFI Fund reserves the right to advise/direct the beneficiary to the designated hospital for the treatment.
- The financial assistance granted will be given directly to the treating hospital/medical center.
- The HCFI Fund has the right to print/publish/webcast/web post details of the patient including photos, and other details. (Under taking needs to be given to the HCFI Fund to publish the medical details so that more people can be benefitted).
- The HCFI Fund does not provide assistance for any emergent heart interventions.

Check List of Documents to be Submitted with Application Form

- Passport size photo of the patient and the family
- A copy of medical records
- Identity proof with proof of residence
- Income proof (preferably given by SDM)
- BPL Card (If Card holder)
- Details of financial assistance taken/applied from other sources (Prime Minister's Relief Fund, National Illness Assistance Fund Ministry of Health Govt of India, Rotary Relief Fund, Delhi Arogya Kosh, Delhi Arogya Nidhi), etc., if anyone.

Free Diagnostic Facility

The Fund has installed the latest State-of-the-Art 3 D Color Doppler EPIQ 7C Philips at E – 219, Greater Kailash, Part 1, New Delhi.
This machine is used to screen children and adult patients for any heart disease.

Free Education and Employment Facility

HCFI has tied up with a leading educational institution and an export house in Delhi NCR to adopt and to provide free education and employment opportunities to needy heart patients post surgery. Girls and women will be preferred.

Laboratory Subsidy

HCFI has also tied up with leading laboratories in Delhi to give up to 50% discounts on all pathological lab tests.

Help Us to Save Lives

The Foundation seeks support, donations and contributions from individuals, organizations and establishments both private and governmental in its endeavor to reduce the number of deaths due to heart disease in the country. All donations made towards the Heart Care Foundation Fund are exempted from tax under Section 80 G of the IT Act (1961) within India. The Fund is also eligible for overseas donations under FCRA Registration (Reg. No 231650979). The objectives and activities of the trust are charitable within the meaning of 2 (15) of the IT Act 1961.

Donate Now...

About Heart Care Foundation of India

Heart Care Foundation of India was founded in 1986 as a National Charitable Trust with the basic objective of creating awareness about all aspects of health for people from all walks of life incorporating all pathies using low-cost infotainment modules under one roof.

HCFI is the only NGO in the country on whose community-based health awareness events, the Government of India has released two commemorative national stamps (Rs 1 in 1991 on Run For The Heart and Rs 6.50 in 1993 on Heart Care Festival- First Perfect Health Mela). In February 2012, Government of Rajasthan also released one Cancellation stamp for organizing the first mega health camp at Ajmer.

Objectives

- Preventive Health Care Education
- Perfect Health Mela
- Providing Financial Support for Heart Care Interventions
- Reversal of Sudden Cardiac Death Through CPR-10 Training Workshops
- Research in Heart Care

Heart Care Foundation Blood Donation Camps

The Heart Care Foundation organizes regular blood donation camps. The blood collected is used for patients undergoing heart surgeries in various institutions across Delhi.

Committee Members

Chief Patron

Raghu Kataria

Entrepreneur

President

Dr KK Aggarwal

Padma Shri, Dr BC Roy National & DST National Science Communication Awardee

Governing Council Members

Sumi Malik
Vivek Kumar
Karna Chopra
Dr Veena Aggarwal
Veena Jaju
Naina Aggarwal
Nilesh Aggarwal
H M Bangur

Advisors

Mukul Rohtagi
Ashok Chakradhar

Executive Council Members

Deep Malik
Geeta Anand
Dr Uday Kakroo
Harish Malik
Aarti Upadhyay
Raj Kumar Daga
Shalin Kataria
Anisha Kataria
Vishnu Sureka
Rishab Soni

This Fund is dedicated to the memory of **Sameer Malik** who was an unfortunate victim of sudden cardiac death at a young age.

- HCFI has associated with Shree Cement Ltd. for newspaper and outdoor publicity campaign
- HCFI also provides Free ambulance services for adopted heart patients
- HCFI has also tied up with Manav Ashray to provide free/highly subsidized accommodation to heart patients & their families visiting Delhi for treatment.

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

Sinus Venosus Atrial Septal Defect with Hemianomalous Right Upper Pulmonary Venous Drainage in Holt-Oram Syndrome

PRADEEP KUMAR RADHAKRISHNAN*, GAYATHRI ANANYAJYOTHI AMBAT†, ROSHINI AMBAT‡, NIHAS NAZER#, ARUN VIJAYA KUMAR¥, MURUGAN S$, YA NAZER£

ABSTRACT

Holt-Oram syndrome (HOS), an autosomal dominant genetic condition, is characterized by congenital heart defects, upper limb abnormalities and heart block. HOS is associated with *TBX5* mutation. The condition is often associated with ostium secundum type of ASD. We present here the case of a 2-year-old child with sinus venosus atrial septal defect with hemianomalous right upper pulmonary venous drainage in HOS.

Keywords: Holt-Oram syndrome, hemianomalous pulmonary venous drainage, atrial septal defect - sinus venosus, preimplantation genetic diagnosis

Holt-Oram syndrome (HOS) is an autosomal dominant genetic condition characterized by congenital heart defects, upper limb abnormalities and heart block and is associated with *TBX5* mutation. During surgical correction of atrial septal defects (ASDs), problems encountered from the Anesthetist's perspective include difficulty in placing vascular lines, tracheal intubation, ventilation and problems in invasive arterial monitoring. Association with sinus venosus ASDs with hemianomalous pulmonary venous drainage is rare. Surgical correction with rerouting is reported here.

CASE REPORT

A 2 year-old child presented with failure to thrive, excessive sweating and feeding difficulty. Associated features were absent right thumb and imperforate vagina. There was no family history of congenital heart disease. Right radial pulse was absent. The right arm was short and the left arm was normal. X-ray of right arm showed absent radius. Chest X-ray showed cardiomegaly and electrocardiogram (ECG) showed incomplete right bundle branch block. Evaluation showed situs solitus, levocardia, atrioventricular and ventriculoarterial concordance, normal systemic and pulmonary venous drainage, a large sinus venosus ASD measuring 5 mm × 2 mm with right upper hemianomalous pulmonary venous drainage, and tricuspid regurgitation (PG = 20 mmHg). Lab evaluation was within normal limits. Inhalational anesthetic induction was given to facilitate endotracheal intubation. Femoral artery and internal jugular venous cannulation were done under ultrasound guidance. ASD closure and rerouting of hemianomalous pulmonary venous drainage was done under mild hypothermia (32 C) and cardioplegic cardiac arrest by autologous nonfixed pericardial patch closure. Weaning from cardiopulmonary bypass (CPB) was smooth in normal sinus rhythm and no residual shunt was detected on epicardial echocardiography.

DISCUSSION

Effective prenatal genetic diagnosis of Holt-Oram syndrome (HOS) is limited by factors that modify clinical manifestations and confound prediction of an individual's phenotype. Familial ASDs are often

*Professor and Head, Dept. of Cardiac Surgery
†Student MBBS
GIMSR-GITAM University, Visakhapatnam, Andhra Pradesh
‡Senior Consultant, Obstetrics and Gynecology, KIMS, Trivandrum, Kerala
#Junior Consultant, Cardiothoracic and Vascular Surgery (CTVS)
¥Senior Consultant, Cardiac Anesthesia
$Senior Consultant, CTVS
£Director, CTVS
Travancore Heart Institute-Travancore Medical College, Kollam, Kerala
Address for correspondence
Prof Pradeep Kumar Radhakrishnan
Doctors Quarters, 207, GITAM University, Rushikonda, Gandhi Nagar, Visakhapatnam, Andhra Pradesh - 530 045
E-mail: rpksai@hotmail.com

associated with *GATA4* and *NKX2-5* mutations. Abnormalities in genes essential to cardiac septation have been associated with ASDs, including mutations in the cardiac transcription factor gene *NKX2-5*, *GATA4* and *TBX5, MYH6* located on chromosome 14q12 and other mutations. HOS is often associated with ostium secundum type of ASD. Ostium primum ASDs are often associated with DiGeorge syndrome and Ellis-van Creveld syndrome. Cardiac defects in HOS include ASD (34%), ventricular septal defect (VSD, 25%), patent ductus arteriosus (PDA), ECG changes (35%) and asymptomatic conduction disturbance with variable degree of AV block. Heart-hand syndrome type II (Tobatznik syndrome), Heart-hand syndrome type III (OMIM 140450) do not include ASD and do not map to band 12q2. Those with HOS may have additional bone abnormalities such as a missing thumb, a long thumb, partial or complete absence of bones in the forearm, underdeveloped bone of the upper arm, and abnormalities of the collar bone or shoulder blades. The manifestations of HOS are dysplasia of upper limb, ranging from minor radiographic abnormalities to phocomelia and cardiac abnormalities. The associated skeletal deformities include triphalangeal thumbs, carpal bone dysmorphism, shortness of ulna, short humerus, aplasia of the radius and phocomelia.

In addition to anomalous pulmonary venous drainage, inferior vena caval interruption and persistent left superior vena cava may be associated. Hypoplastic peripheral vessels add on to difficulty in catheterization and invasive monitoring. Individuals may present at birth with sinus bradycardia and first-degree atrioventricular (AV) block. AV block can progress unpredictably to a higher grade including complete heart block with and without atrial fibrillation. Pre-pregnancy history of arrhythmia and maternal age more than 0 years have been noted as risk factors for maternal cardiac complications. By comparison with the general population, women with unrepaired ASDs had an increased risk of pre-eclampsia, fetal loss and low birth weight. By contrast, the outcome for offspring of women with a repaired defect was similar to that of the general population. Pregnancy should be avoided in women with an ASD and severe pulmonary hypertension.

In a contemporary study, maternal mortality was prohibitively high (8) in women with congenital heart disease and pulmonary hypertension, despite use of pulmonary vasodilator therapy in more than half of the patients.

CONCLUSION

Sinus venosus, primum and coronary sinus septal defects need surgical closure. Secundum defects can be closed by either surgery or by a percutaneous route using an occluding device delivered by a catheter. Transcatheter closure might not be feasible in some large secundum defects or small infants. Status of peripheral vessels needs evaluation before transcatheter procedures are planned. A variety of cardiac anomalies may be associated with conduction problems and other system involvement in HOS, which may make both device closure and surgical approaches to be meticulously planned well in advance with appropriate investigations and diagnosis of all associated lesions. As we go on to identify more genetic etiologies for congenital heart defects, preimplantation genetic diagnosis, as an adjunct to *in vitro* fertilization, will help prevent transmission of such diseases from parents to their children.

SUGGESTED READING

1. Holt M, Oram S. Familial heart disease with skeletal malformations. Br Heart J. 1960;22(2):236-42.
2. Varma PK, Padmakumar R, Harikrishnan S, Koshy T, Neelakandhan KS. Holt-Oram syndrome with hemizygous continuation of inferior vena cava. Asian Cardiovasc Thorac Ann. 2006;14(2):161-3.
3. Girish BN, Rajesh S, Somasekharam P, Kumar P. Anaesthetic management of emergency caesarean section in a patient with Holt Oram syndrome. J Anaesthesiol Clin Pharmacol. 2010;26(4):541-3.
4. Walencka Z, Jamsheer A, Surmiak P, Baumert M, Jezela-Stanek A, Witek A, et al. Clinical expression of Holt-Oram syndrome on the basis of own clinical experience considering prenatal diagnosis. Ginekol Pol. 2016;87(10):706-10.
5. Szymczyk E, Wejner-Mik P, Lipiec P, Michalski B, Kasprzak JD. Atrial septal defect type II and upper limb malformation in 40-year-old male as a manifestation of Holt-Oram syndrome. Cardiol J. 2019;26(3):302-3.
6. He J, McDermott DA, Song Y, Gilbert F, Kligman I, Basson CT. Preimplantation genetic diagnosis of human congenital heart malformation and Holt-Oram syndrome. Am J Med Genet A. 2004;126A(1):93-8.
7. Ikeda Y, Hiroi Y, Hosoda T, Utsunomiya T, Matsuo S, Ito T, et al. Novel point mutation in the cardiac transcription factor CSX/NKX2.5 associated with congenital heart disease. Circ J. 2002;66(6):561-3.
8. D'Amato E, Giacopelli F, Giannattasio A, D'Annunzio G, Bocciardi R, Musso M, et al. Genetic investigation in an Italian child with an unusual association of atrial septal defect, attributable to a new familial GATA4 gene mutation, and neonatal diabetes due to pancreatic agenesis. Diabet Med. 2010;27(10):1195-200.

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

Disseminated Trichosporonosis Presenting with Acute Emphysematous Pyelonephritis in Severely Comorbid Patient

JAY V CHAUDHARI

ABSTRACT

Trichosporon asahii is a basidiomycetous yeast, which is a rare and life-threatening pathogen and is invariably associated with disseminated trichosporonosis. Presented here is the report of a successfully treated case of a 74-year-old female with disseminated trichosporonosis who presented with acute emphysematous pyelonephritis complicated with septic plus cardiogenic shock and septic acute renal failure and heart failure stage 'C' with ischemic heart disease, diabetes mellitus type 2, hypertension. She was admitted in our hospital with complaints of high-grade fever, abdominal pain, nausea, vomiting, giddiness, burning micturition, difficulty in breathing since 1 week. CT scan KUB showed acute emphysematous pyelonephritis and blood culture and urine culture showed growth of *T. asahii.* Antifungal susceptibility testing was done and the pathogen was found sensitive to voriconazole, fluconazole and amphotericin B. Patient responded well to intravenous voriconazole and improved completely in such severely comorbid condition. Disseminated trichosporonosis is a very rare disease with mortality rate as high as 70%, especially in severely comorbid patient.

Keywords: Trichosporonosis, emphysematous pyelonephritis, antifungal, voriconazole

The genus Trichosporon is characterized by the production of septate hyphae, arthroconidia, and pseudohyphae and by yeast-like growth on culture media. There are over 50 known species of Trichosporon, 16 of them being clinically relevant. Invasive human infection is most commonly due to *Trichosporon asahii*, and less commonly with other species. Trichosporon can be found in soil, water, on plants and can colonize human mouth, gastrointestinal tract, respiratory tract, vagina, skin and urine. Over 200 cases of deep trichosporonosis have been described in literature.

Trichosporonosis represents an acute, febrile infection, which can often be fatal, with dissemination to several deep organs. It is associated with a mortality rate of about 64% . On biopsy, Trichosporon appears as a mixture of true hyphae, pseudohyphae, budding yeasts and tubular elements with square ends, called arthroconidia. Trichosporonosis is easily mistaken for candidiasis (which does not produce arthroconidia). While the pathogen grows readily on most culture media, blood cultures appear to yield positive results late in the course. Treatment with amphotericin B was recommended in the past; however, poor response and failures with this drug have been noted. These fungi are typically susceptible *in vitro* to voriconazole, as well as fluconazole, isavuconazole, itraconazole and posaconazole. Therefore, treatment should include the use of one of these azole antifungals.

Trichosporon species are being increasingly reported as an emerging pathogenic yeast-like fungi among a wide-spectrum of clinical presentations ranging from superficial involvement to disseminated invasive disease. The dissemination may occur in spleen, liver, kidney, bone marrow, brain and eye.

CASE REPORT

A 74 year-old female presented with the chief complains of severe abdominal pain, nausea, vomiting, high-grade fever, burning micturition and difficulty in breathing, associated with perspiration for the last 1 week. She

Consultant Physician
Shree Sardar Smarak Hospital, Bardoli, Surat, Gujarat
Address for correspondence
Dr Jay V Chaudhari
Quarter No.: A4, A-Block
Shree Sardar Smarak Hospital Campus, Bardoli,
Surat, Gujarat - 394 601
E-mail: jayjvc@gmail.com

had consulted with general practitioner and taken medication for 5 days without any improvement. She was a known case of ischemic heart disease, diabetes mellitus type 2 and hypertension. On examination, she was found to be febrile with tachycardia (PR-130/min), blood pressure - 0 mmHg systolic, respiratory rate - 30/min, oxygen saturation - 89% on room air, random blood sugar (RBS) - 287 mg/dL. Electrocardiogram (ECG) showed complete left bundle branch block (LBBB) pattern and chest X-ray showed bilateral lower zone haz ness and cardiomegaly. On doing ultrasonography (USG) abdomen and KUB (kidney, ureter and bladder), changes of acute pyelonephritis were found in right kidney. Computed tomography (CT) KUB plain was done which showed bulky edematous right kidney with perinephric fat stranding, thickening of Gerota's fascia and air foci in anterior aspect of right kidney, suggestive of acute emphysematous pyelonephritis (Fig.).

The laboratory findings at the time of admission were hemoglobin (Hb) - 3 white blood cell (W C) count - 17,000/mm^3 out of which neutrophils - 8% , lymphocytes - 0% , eosinophils 3% , platelets - 1,05,000/mm^3, blood urea - 119 mg/dL, serum creatinine - 2.47 mg/dL, serum Na - 129 mEq/L, serum potassium - 5.0 mEq/L, S Cl - 97 mEq/L, total protein - 6.3 g/dL, serum albumin - 3.3 g/dL, RBS - 287 mg/dL, total bilirubin - 1.2 (direct-0.4, indirect-0.8), serum glutamic pyruvic transaminase (SGPT) - 19 IU/L, serum glutamic oxaloacetic transaminase (SGOT) - 20 IU/L, troponin I - negative, C-reactive protein (CRP) - 73.6 mg/L, erythrocyte sedimentation rate (ESR) - 80 mm/hr, serum procalcitonin - 22.93 ng/mL, NT-proBNP - 34,768 pg/mL, D-dimer - 2,410 ng/mL; urine analysis - albumin ++ (100 mg/dL), sugar ++ (500 mg/dL), pus cells - 10-12, red blood cell (RBC) - 5 8

After admission, urine culture was sent which showed growth of budding yeast cells with colony count of 50,000 CFU/mL; blood culture of three bottle sample showed *T. asahii*. Figure 2 shows hyphae and rectangular arthrospores of *T. asahii* and Figure 3 shows cream-colored, wrinkled, yeast-like colonies of *T. asahii* on Sabouraud dextrose-agar (SDA).

Echocardiography showed ischemic dilated cardiomyopathy with ejection fraction 8% , severe systolic dysfunction, moderate MR and TR, Grade 1 diastolic dysfunction. Patient's urine output was 0 mL in 2 hours.

After reviewing the history, examinations and investigations, it was found that the patient was suffering from disseminated trichosporonosis which presented with the acute emphysematous pyelonephritis and was complicated with septic plus cardiogenic shock and septic acute renal failure and heart failure and unstable angina. The patient was already a known case of ischemic heart disease, dilated cardiomyopathy, hypertension and type 2 diabetes mellitus.

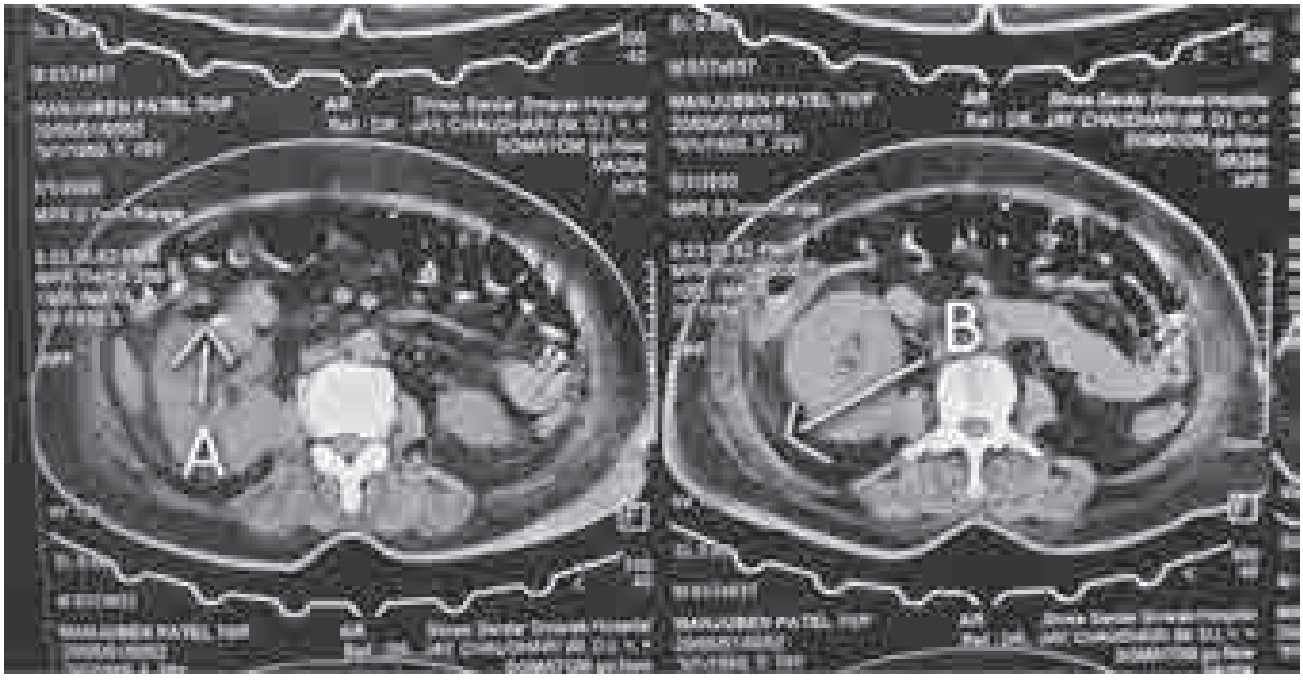


Figure 1. CT KUB Plain showing **A-** Air foci in anterior aspect of right kidney and **B-** Perinephric fat strand suggestive of emphysematous pyelonephritis.

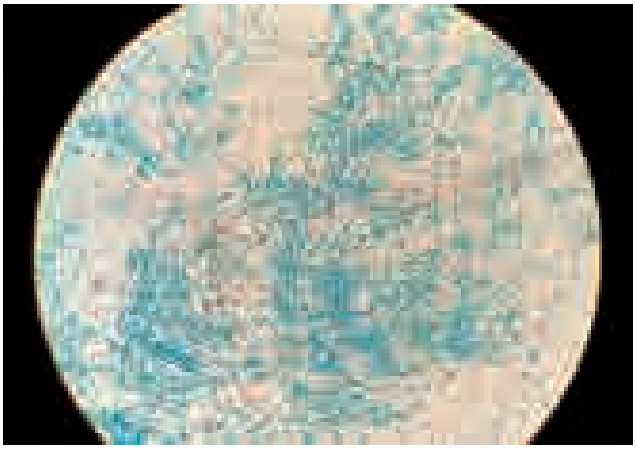


Figure 2. Hyphae and rectangular arthrospores of *T. asahii.*

Figure 3. Cream-colored, wrinkled, yeast-like colonies of *T. asahii* on SDA.

Treatment

After admission, patient was put on broad-spectrum injectable antibiotic meropenem loaded with 1 g, then 0 mg 8 hourly, in divided doses, along with vasopressor support to counteract the septic shock, and oxygen support. On receiving the culture sensitivity report which was showing sensitivity to voriconaø le, fluconazole and amphotericin B, patient was put on one broad-spectrum antibiotic meropenem and added antifungal from aø le group injectable voriconaø le (2 mg) 2 hourly, as voriconaø le appears to be the antifungal agent of choice. After 4 5 days, the patient started responding to the treatment, with blood pressure raising to the normal level, urine output increasing gradually, patient was afebrile and relieved from all symptoms after 1 week. On reviewing blood

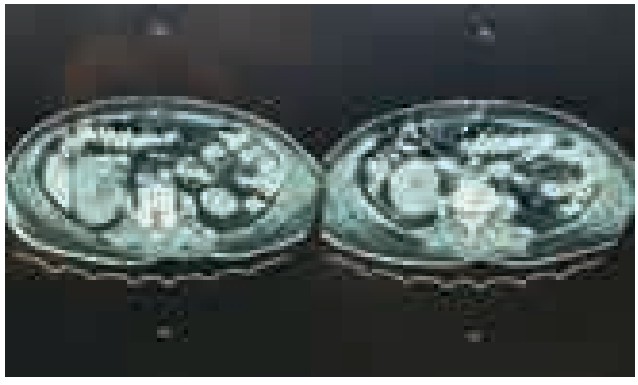


Figure 4. Repeat CT KUB Plain after treatment showing absence of air foci and resolution.

investigation during the course of treatment, it was noted that total WBC count, platelet count, creatinine, urea, procalcitonin started to normaliz. Blood culture and urine culture drawn on 0 h day became sterile. Repeat CT KUB showed resolution and complete absence of air foci in right kidney compared to previous CT KUB (Fig. 4 .

In this case, apart from fungemia, the most challenging aspect was that the patient was also in cardiac failure and cardiogenic shock, which was managed with injectable diuretics (furosemide 2 mg 8 hourly according to permissible level of blood pressure 0 mmHg), oral beta-blocker (metoprolol 2 mg bi d), antiplatelet drugs (aspirin 7 mg, clopidogrel 7 mg, atorvastatin 2 mg), injection nicorandil as continuous infusion as patient was repeatedly facing anginal episode, injectable low molecular weight heparin (LMW), nebulizat ion and uncontrolled diabetes was managed with bolus of regular insulin. Patient repeatedly went into atrial fibrillation which was successfully managed using amiodarone infusion 600 mg in 2 mL/hr infusion for 2 hours; thereafter maintenance with oral amiodarone 2 mg td s . Patient responded very well and came out of the shock, symptoms of cardiac failure relieved and episode of atrial fibrillation also reduced.

DISCUSSION

T. asahii is a universal yeast-like fungi which is present in the soil; however, it may also be present in human skin and gastrointestinal tract and is an emerging fungal pathogen seen in the immunocompromised host. In this patient, the urinary tract may be the portal of entry as the patient is diabetic, which leads to the development of bulky edematous kidney with air locule inside, with perinephric fat stranding, which lead to acute emphysematous pyelonephritis. *T. asahii* was isolated in blood culture suggesting that it was

the causative agent. Trichosporon species is susceptible *in vitro* to voriconazole, fluconazole, isavuconazole, itraconazole and posaconazole. Therefore, treatment should include the use of one of these azole antifungals. Trichosporon species is resistant to echinocandins but appears to respond clinically to treatment with voriconazole. Azoles are shown to be more effective in the treatment of trichosporonosis than amphotericin B. Voriconazole appears to be the antifungal agent of choice in disseminated trichosporonosis. The mortality rate for disseminated Trichosporon infection has been as high as 70% but is decreasing with the use of newer azoles, such as voriconazole.

CONCLUSION

In the present case, *T. asahii* was sensitive to voriconazole, fluconazole and amphotericin B and the patient responded well to voriconazole therapy. Isolation of same yeast in two consecutive blood and urine culture samples and isolation of no bacteria concluded *T. asahii* as the etiological agent of the infection in this patient. There was absence of growth of fungus in urine and blood culture with complete recovery of the patient following antifungal treatment. This strongly validates *T. asahii* as the cause of disseminated infection in this case.

SUGGESTED READING

1. Bennett JE, Dolin R, Blaser MJ. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 8th Edition, Vol 1. Philadelphia: Elsevier; 2015.
2. Chander J. Textbook of Medical Mycology. 4th Edition. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd; 2018.
3. Harrison's Principles of Internal Medicine. 20th Edition, Vol 2.
4. Medical Microbiology by Patrick, Ken, Michael. 9th Edition.
5. Grainger and Allison's Diagnostic Radiology a Textbook of Medical Imaging. 6th Edition, page no 848.
6. Braunwald's Heart Disease a Textbook of Cardiovascular Medicine. 11th Edition.

■■■■

No Increase in Death Risk with Immune Checkpoint Inhibitors for COVID-19 Cancer Patients

Use of immune checkpoint inhibitors was not associated with an increased mortality risk from COVID-19 in patients with cancer, reported an international observational study.

The study included 113 cancer patients with laboratory-confirmed COVID-19 within 12 months of receiving immune checkpoint inhibitor treatment. The patients did not receive chemotherapy within 3 months of testing positive for COVID-19. Thirty-three patients were admitted to the hospital, including 6 admitted to the ICU; 9 patients died. This represents a mortality rate of 8% , which is in the middle of the rates reported previously for cancer patients in general (5 2%). COVID-19 represented the primary cause of death in 7 of the patients, including 3 of those admitted to the ICU. The findings were presented at the AACR virtual meeting: COVID-19 and Cancer… (*Medscape*)

Only 16 Volunteers to Take Part in Coronavirus Vaccine Trials at AIIMS-Delhi

New Delhi: The COVID-19 vaccine trial at AIIMS-Delhi will include only 16 volunteers in the first phase. While it was initially planned to include 10 volunteers for the trial, the number was reduced as several locals who intended to participate were found to have antibodies against the virus.

The target of 3 volunteers for the trial of India's indigenously developed Covaxin has been met already. A senior doctor involved in the trials at Delhi's premier hospital stated that besides AIIMS-Delhi, 1 other centers are conducting vaccine trials and that they have already enrolled enough people to test the vaccine… (*ET Healthworld – TNN*)

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

An Isolated Conjunctival Capillary Hemangioma Masquerading as Ocular Surface Squamous Neoplasia

ASHOK RATHI*, RS CHAUHAN*, JP CHUGH†, VANDANA SHARMA‡, GAUTAM JAIN#

ABSTRACT

The purpose of this article is to report a case of isolated subconjunctival capillary hemangioma, masquerading as ocular surface squamous neoplasia (OSSN) in a 58-year-old lady. Conjunctival hemangioma over the age of 58 is rare, with few cases reported in the literature. Here, we present an interesting case of spontaneous development of this tumor at age 58, without associated systemic disease process or cutaneous manifestations. This female presented with complaints of isolated elevated vascular nodular lesions with feeder vessels in superior-temporal bulbar portion of left eye. Provisional diagnosis of left eye OSSN was made. Wide excisional biopsy with cryotherapy was performed for the left eye. Histopathology report of the lesion showed subconjunctival capillary hemangioma with no malignancy. The patient did not show any recurrence of lesion in the left eye at 2-month follow-up.

Keywords: Conjunctival hemangioma, ocular surface squamous neoplasia, vascular nodular lesion, excisional biopsy, cryotherapy

Vascular tumors of the conjunctiva are uncommon and usually arise without pathology. Such tumors are lymphangioma, cavernous hemangioma, Kaposi's sarcoma, pyogenic granuloma and capillary hemangioma. Vascular malformations, such as lymphangioma and arteriovenous malformations, may be seen at birth and growing gradually, may persist into adult life. Capillary hemangiomas of the conjunctiva are quite rare especially in elderly patient. Generally it has been observed that the older the patient, the higher the risk of malignant tumor on the conjunctiva. Thus, such tumors must be carefully examined before removal. Here, we discuss the development of a conjunctival hemangioma with rapid growth in a 58 year-old patient - a presentation not previously noted in the literature. The purpose of this case report is to describe an isolated capillary hemangioma of conjunctiva in an elderly female as a rare entity.

CASE PRESENTATION

A 58 -year-old female presented with a brown-colored, blood-filled cyst in the superotemporal region of left eye since 1 month. Patient did not have pain, any diminution of vision, size or color of the lesion, and did not report any kind of eye trauma, allergy or use of medications including anticoagulants or nonsteroidal anti-inflammatory drugs (NSAIDs). The patient was aphakic since last 4 years with horizontal oval pupil left eye. Patient's chief complaint was brown mass in the white portion of eye coincidentally noticed since 3 days along with foreign body sensation and ocular itching in the left eye.

On examination, best corrected visual acuity of the patient was 6/6 in both eyes. Extraocular movements were full in both eyes. Slit lamp biomicroscopy of the left aphakic eye revealed a 5 × 3 mm, partially mobile, semi-solid, pedunculated conjunctival hemorrhagic lesion. The lesion was dark-brown in color, had well-defined borders and was located in the superotemporal region. There were no associated feeder vessels and pulsations.

*Professor
†Senior Professor
‡Eye Specialist
#Resident
Regional Institution of Ophthalmology, Pt BD Sharma Post Graduate Institute of Medical Sciences, Rohtak, Haryana
Address for correspondence
Dr Ashok Rathi
Professor
Regional Institution of Ophthalmology, Pt BD Sharma Post Graduate Institute of Medical Sciences, Rohtak - 124 001, Haryana
E-mail: dr.ashokrathi@yahoo.com

Anterior segment examination showed aphakia with oval-shaped pupil. Intraocular pressure was within normal range in both eyes. Fundus examination in both eyes was normal. The lesion can be seen in Figure 1 as it presented. Ultrasonography revealed the tumor had a sharply defined margin and had no deeper invasion of the sclera. Since, the incidence of malignancy is high for conjunctival neoplasms in patients over 8 years, the lesion was planned for excision biopsy (Fig. 2). The excised mass was sent for histopathological analysis. The patient was treated postoperatively with topical antibiotic and steroid and healed well within a 2 week period. Patient remained asymptomatic in subsequent follow-up at 1 month and 2 months (Fig. 3).

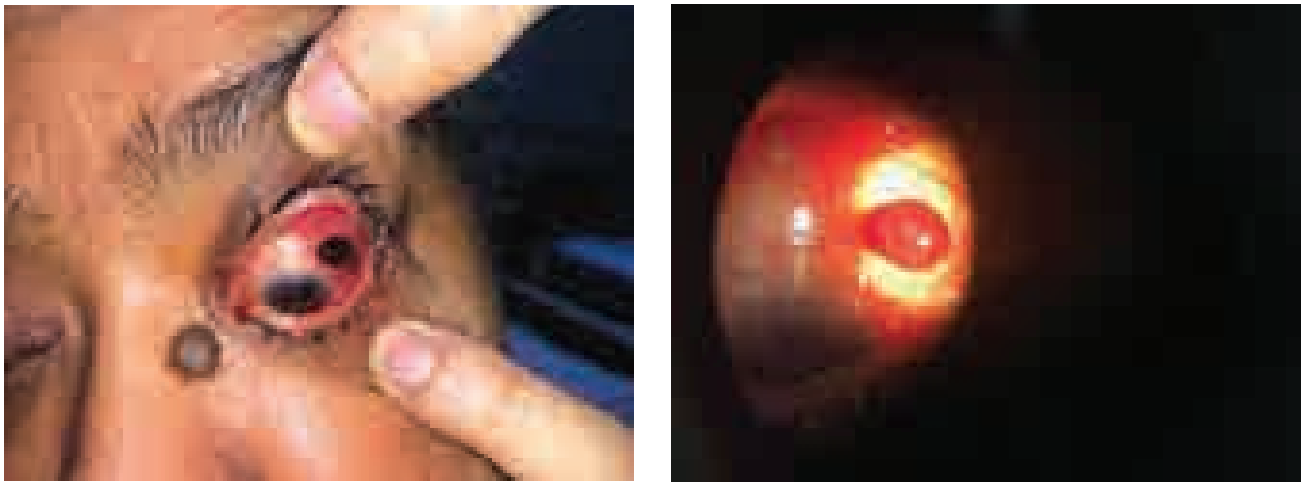


Figure 1. Conjunctival mass.

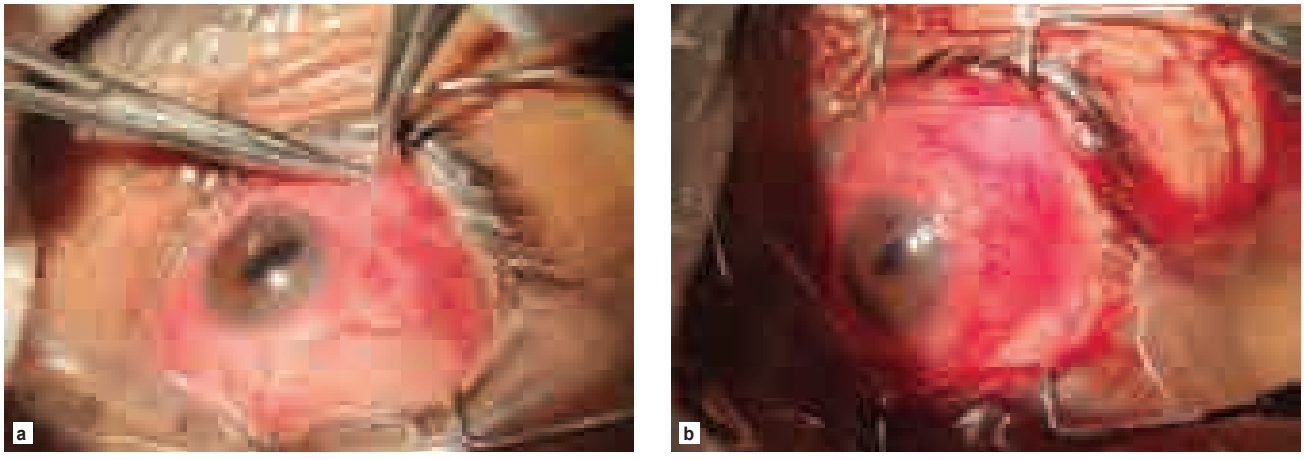


Figure 2 a and b. Excision of growth.

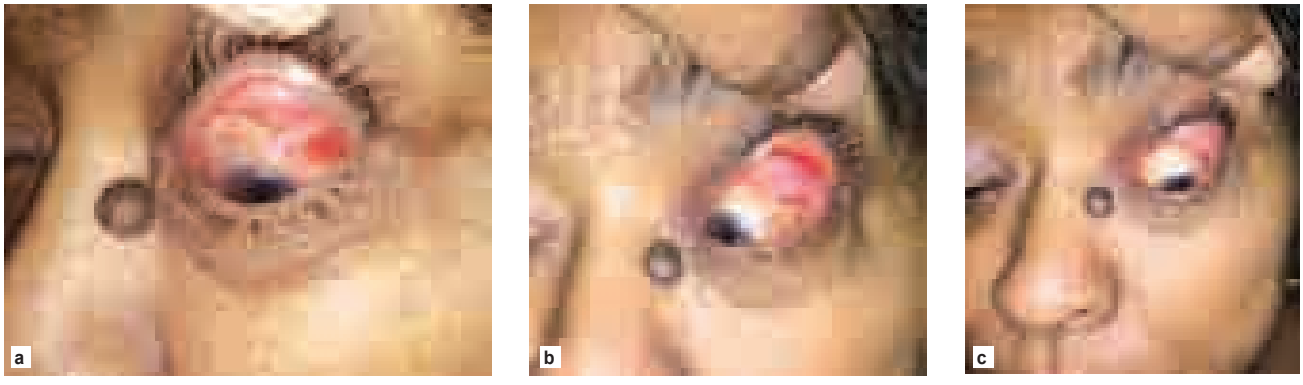


Figure 3 a-c. Postoperative follow-up.

Figure 4. Conjuctival epithelium and capillary proliferation.

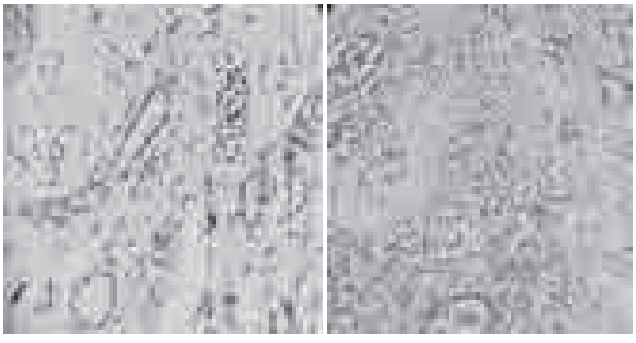


Figure 5 and 6. Capillary proliferation.

Conjunctival biopsy revealed subepithelial proliferation of variably thin-walled vascular channels that were lined by a single layer of endothelial cells. Some were filled with blood. Extravasated red blood cells could also be seen. The final diagnosis was conjunctival capillary hemangioma. The tumor was diagnosed as a conjunctival capillary hemangioma. Figures 4 6 present the histopathology findings.

DISCUSSION

Conjunctival hemangioma accounts for about 2% of all the conjunctival neoplasms. Conjunctival vascular tumors are not common and a few of the lesions commonly found in this group are pyogenic granuloma, lymphangioma and capillary hemangioma. A hemangioma represents a developmental malformation of the blood vessels and presents an example of a hamartoma. A hemangioma may be capillary, venous or arterial with an incidence of 1 2% of all benign growths of the conjunctiva. Sixty percent of conjunctival tumors in patients over 0 years of age are malignant.

The conjunctival vascular tumors remain asymptomatic for a long time and exhibit a benign clinical behavior. These tumors may occur as isolated or may be linked with other ocular capillary hemangiomas such as Sturge-Weber syndrome. The lesion usually presents with an intact surface epithelium with positive vascular endothelium and pericytes markers, including CD3 CD IA-4

Management of these lesions is decided on the basis of presumptive diagnosis, size and extent of the lesion. Serial observation, incisional/excisional biopsy, cryotherapy, chemo-/radiotherapy, modified enucleation, exenteration are all possible options, depending on suspicion, growth and nature of the tumor.

CONCLUSION

As is the case with other tumors of the conjunctiva, each case must be managed individually and any atypical characteristics and growth pattern must be looked for. This case is unique from the cases that have been previously published in the literature as our patient developed this tumor at age 8 without any associated systemic or cutaneous manifestations.

SUGGESTED READING

1. Shields JA, Mashayekhi A, Kligman BE, Kunz W , Criss J, Eagle RC, et al. Vascular tumors of the conjunctiva in c ases.O phthalmology. 7 7 5
2. Shields C, Shields JA. Tumors of the conjunctiva and cornea.S urv Ophthalmol. 3 2
3. Muranaka K, Kunimatsu S, Kaji Y, Joko S, Kato S, Numaga J. Conjunctival haemangioma in an elderly patient.E ye.
4. Shields JA, Kligman BE, Mashayekhi A, Shields CL. Acquired sessile hemangioma of the conjunctiva: a report of cases. Am J Ophthalmol. : 5 1
5. Chang TC, Estes R. Beta blocker treatment of infantile conjunctival hemangiomas - observations from 2 cases. J AAPOS. 2
6. Fernández Vega Cueto L, Tresserra F, de la Paz MF. Crecimiento de novo de un hemangioma capilar conjuntival [De novo growth of a capillary hemangioma of the conjunctiva]. Arch Soc Esp Oftalmol. 7 9
7. Haik BG, Karcioglu ZA, Gordon RA, Pechous BP. Capillary hemangioma (infantile periocular hemangioma). Surv Ophthalmol. 1994;38(5):399-426.
8. Rosca TI, Pop MI, Curca M, Vladescu TG, Tihoan CS, Serban AT, et al. Vascular tumors in the orbit - capillary and cavernous hemangiomas. Ann Diagn Pathol. 2006;10(1):13-9.

9. Ash JE. Epibulbar tumours. Am J Ophthalmol. 1950; 33(8):1203-19.
10. Lubahn JG, Lee RK, Karp CL. Resolution of conjunctival sessile hemangioma with topical timolol. Cornea. 2014;33(1):99-100.
11. Rao MR, Patankar VL, Reddy V. Cavernous haemangioma of conjunctiva (a case report). Indian J Ophthalmol. 1989;37(1):37-8.
12. Duke-Elder S. System of ophthalmology. Vol VIII, Diseases of the Outer Eye, Part 2. London: Henry Kimpton; 1965.

■■■■

Pooled COVID-19 Testing Feasible

Mixing specimens can conserve personal protective equipment (PPE), improve patient care and bring about a significant reduction in staff and patient anxiety. These findings were published on July 20 in the *Journal of Hospital Medicine*. The study depicted that combining specimens from various low risk inpatients in a single test for SARS-CoV-2 infection will make way for the hospital staff to stretch testing supplies and enable them to provide results at a faster rate for an increased number of patients.

The pooled testing strategy involves combining testing samples taken from multiple people within a single test. If the reports are negative, the pooled testing is beneficial in providing the test results for 3-5 people simultaneously, while the testing resources used were that of a single test. In retrospect, the challenge is that if the reports are positive, then every individual whose sample was mixed has to go for a retest as one or more from the group could be infected.

In the present study, all the patients admitted to the hospital including those admitted for observation, underwent testing for SARS-CoV-2 Patients who did not have any symptoms or clinical evidence of COVID-19 were considered to be at low-risk and underwent pooled testing.

However, patients with any clinical evidence of COVID-19 (respiratory symptoms or laboratory or radiographic findings) were considered high-risk and were excluded from the study.

The study included 53 patients visiting the hospital between April 7 and May 1 One hundred seventy-nine cartridges (72 with swabs from 3 patients and 7 with swabs from 2 patients) were used. The results showed 4 pooled positive tests, making it necessary for all those study participants to be individually retested leading to an additional use of 11 cartridges. In all, the study made use of 90 cartridges, a number 40 less than if the patients were individually tested.

The findings from the low-risk patient group was encouraging with the positive rate of 0.8% (4 out of 530); none of the patients from pools tested negative were tested positive later during the course of their hospitalization or developed any evidence of the infection.

The researchers concluded that pooled testing strategy is most beneficial when 3-5 patients are included in a pooled test; however, larger batches increase the risk of having a positive test.

Pooled testing is primarily based on the COVID-19 positive rate in the population of interest along with the sensitivity of the RT-PCR method used for COVID-19 testing. The research findings clearly suggested that the pooled testing could raise the testing capability by 80% or more when the incidence rate of SARS-CoV-2 infection is 10% or lower.

The authors recommend that asymptomatic population or surveillance groups including students, athletes and military service members are ideal for pooled testing. Even though the study did not shown any false-negative specimen, its limitation is that there is a risk of missing specimens with low concentration of the virus owing to the dilution factor of pooling (false-negative specimens).

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

Autoimmune Hemolytic Anemia – An Interesting Case Report

V PADMA*, B ABHILASH NAIR†

ABSTRACT

Autoimmune hemolytic anemia is one of the causes of acquired hemolytic anemia. Autoimmune hemolytic anemia (warm) occurs due to antibodies (IgG) which cross-react with the antigens present on the red blood cell (RBC) surface at body temperature. Several factors may be responsible for causing autoimmune hemolytic anemia (warm), including preceding viral infections, autoimmune and connective tissue disease, immune deficiency diseases, malignancy, prior allogeneic blood transfusion, drugs or hematopoietic cell transplantation or solid organ transplantation. Presented here is the case of a 47-year-old female who presented with severe pallor and icterus. A diagnosis of autoimmune hemolytic anemia (warm) was arrived at and the patient was treated with oral and parenteral steroids.

Keywords: Hemoglobin, direct Coombs test, autoimmune hemolytic anemia

Anemia can occur as a result of various causes, one of which is acquired hemolytic anemia. One of the causes of acquired hemolytic anemia is autoimmune hemolytic anemia, which itself has two further subtypes, ie, warm and cold. Autoimmune hemolytic anemia (warm) occurs due to antibodies (IgG) which cross-react with the antigens present on the red blood cell (RBC) surface at body temperature. Destruction of RBC occurs at body temperature unlike cold agglutinin disease, where destruction of RBC occurs mostly at colder temperature and in cooler parts of the body. It may be associated with systemic lupus erythematosus (SLE) in about 0% of the population.

CASE REPORT

A 47 year-old female came with chief complaints of breathlessness, aggravated on exertion or activity and not improved on taking rest. There was no shortness of breath on lying flat or any attack of severe shortness of breath and coughing at night. There was no history of chest pain or abdominal pain. And no history of reduced renal output. Additionally, there was no history of altered sensorium or loss of consciousness or weight loss, no history of fever, loose stools, nausea, vomiting or drug allergy. Her bowel and bladder habits were regular, appetite reduced and reduced sleep. She was not a known case of diabetes mellitus, hypertension, tuberculosis, bronchial asthma, prior surgery or epilepsy.

Examination

On examination, patient was moderately built and nourished. She looked tired and dehydrated. She was conscious, oriented and afebrile. She had severe pallor and icterus was present. There was no cyanosis, clubbing, lymphadenopathy or edema. Cardiovascular system examination was normal with S1 and S2 heard, no murmurs were present and so was respiratory system examination with bilateral air entry present and no added sounds present. CNS examination did not reveal any significant findings, with no focal neurological deficit and per abdomen examination did not reveal any anomaly like tenderness or organomegaly. Her blood pressure was 120/80 mmHg, respiratory rate was 98 bpm. Capillary blood glucose was 102 mg/dL and her saturation were 9% at room air.

Investigations and Management

All routine investigations were sent. On account of signs of severe anemia, we sent for urgent complete blood count. Her hemoglobin turned out to be 2.8 g/dL,

*Professor
†Junior Resident
Dept. of Medicine, Sree Balaji Medical College, Chennai, Tamil Nadu
Address for correspondence
Dr V Padma
Professor
Dept. of Medicine, Sree Balaji Medical College, Chennai, Tamil Nadu
E-mail: padmaramesh86@yahoo.com

white blood cell (WBC) count was 6,050 cells/mm^3, erythrocyte sedimentation rate (ESR) was 45 mm at 1st hour, platelet count was 1.21 lakh cells/mm^3, packed cell volume (PCV) was 35.7. We immediately planned for 2 packed cell transfusion. However, we couldn't transfuse it because of cross-reaction. Meanwhile, her other investigation reports came out which showed liver functions to be mildly deranged, with serum glutamic-oxaloacetic transaminase (SGOT) of 63.1 (normal <31), serum glutamic-pyruvic transaminase (SGPT) of 41.2 (normal <34) and lactate dehydrogenase (LDH) of 811 (normal 225-450). Her renal function test parameters were normal with urea 26.7, creatinine 0.94. Her serum iron was 197 (normal 50-170). Stool occult was negative and so was C-reactive protein (CRP). Her peripheral smear showed predominantly normocytic normochromic red blood cell (RBC) with few macrocytes, occasional spherocytes and few normoblasts. Total leukocyte count was mildly increased. Platelet clumps were adequate and mildly increased. Her reticulocyte count was 31.5%. Based on the above values, the provisional diagnosis was hemolytic anemia with differential diagnosis narrowed down to autoimmune hemolytic anemia, B12 deficiency anemia and pernicious anemia.

Further investigations were ordered. Her red cell glucose-6-phosphate dehydrogenase (G6PD) enzyme screening test showed normal enzyme activity, isopropanol stability test for unstable hemoglobin was negative, direct Coombs test was positive (++) and Ham's test was negative. Bone marrow aspiration cytology showed hypercellular marrow showing severe erythroid hyperplasia with mild megaloblastic like picture. The ANA (antinuclear antibody) was positive with a value of 1.4 and anti-dsDNA was also positive with a value of 1.2. Hemoglobin electrophoresis using starch agarose gel method was normal. Serum electrophoresis report showed increase in gamma-globulin and decrease in albumin. Thus, a final diagnosis of autoimmune hemolytic anemia (warm) was made. She was treated with oral and parenteral steroids and was kept under antibiotics coverage. No packed cell transfusion was done. Her hemoglobin, which was 2.8 mg/dL at admission, gradually increased over the next few days. Day 2 hemoglobin was 2.7 mg/dL, which rose to 3.1 mg/dL at Day 3, 3.1 mg/dL at Day 4, 4.7 mg/dL at Day 5 and 5.2 mg/dL at Day 6. She was then discharged at request with a hemoglobin of 5.2 mg/dL. Thus, without even transfusing a single pint of blood, her hemoglobin was corrected with the use of steroids only.

Follow-up

She is under regular follow-up. Her hemoglobin at end of 2 months is 11.3 g/dL.

DISCUSSION

Autoimmune hemolytic anemia (warm) may occur due to various causes. It may be due to preceding viral infections, autoimmune and connective tissue disease (e.g., SLE, autoimmune lymphoproliferative syndrome), immune deficiency diseases, malignancy (Non-Hodgkin lymphoma, chronic lymphocytic leukemia [especially those being treated with purine analogues]), prior allogeneic blood transfusion, drugs or hematopoietic cell transplantation or solid organ transplantation. Clinical features depend not only on the amount but also the effectiveness of the causative antibody. Most of the patients are generally moderately to severely anemic. Symptoms also depends on the clinical severity of the disease, whether the patient is exerting or not and whether there is a presence of a concurrent illness (e.g., underlying cardiac disease). Symptoms seem to occur when the hemoglobin concentration falls below 8-9 g/dL at rest, or at a higher hemoglobin concentration during exertion. The primary symptoms include varying degrees of fatigue, dyspnea at rest, exertional dyspnea and signs and symptoms of the hyperdynamic state, such as bounding pulses, palpitations. If the hemoglobin does fall below a certain level which is required to sustain sufficient oxygenation, the patient may become confused, lethargic and dyspneic with tachycardia. Physical examination may show varying degrees of jaundice and pallor.

The findings include hemolytic anemia of varying severity, reticulocytosis in response to the anemia, the presence of spherocytic red cells on the peripheral blood smear, and a positive direct antiglobulin (Coombs) test. Serum haptoglobin levels may be reduced, serum levels of LDH will be elevated, serum levels of indirect bilirubin are also elevated, the peripheral blood smear usually shows the presence of spherocytosis. Ninety-seven to ninety-nine percent of patients with warm agglutinin autoimmune hemolytic anemia will exhibit a positive result with anti-IgG, anti-C3 or both, compared with <1% of the normal population. The Coombs test can be quantitated by an estimate of the degree of agglutination, or by more quantitative methods such as enzyme-linked immunosorbent assay (ELISA), immunoassay techniques or flow cytometry.

The workup for all patients should include the following:

- Complete blood count with RBC indices (eg , mean corpuscular volume [MCV], mean corpuscular hemoglobin [MCH], mean corpuscular hemoglobin concentration [MCHC]), reticulocyte percentage, absolute reticulocyte count and examination of the peripheral blood smear.
- Tests for hemolysis, including indirect bilirubin, LDH and haptoglobin.
- Direct Coombs testing (also called direct anti-globulin test [DAT]), including testing for both IgG and C3 on the red cell surface.
- Testing for specificity of the antibody for antigens identified on RBCs.

The diagnosis of warm agglutinin autoimmune hemolytic anemia is made when all of the following are present:

- Hemolytic anemia (anemia, high LDH, low haptoglobin, high indirect bilirubin)
- Presence of spherocytic RBCs on the peripheral blood smear
- Positive direct antiglobulin (Coombs) test for the presence of IgG or C3 (after ruling out cold agglutinin disease) or both.

While in most cases, there will also be an absolute increase in reticulocytes, such reticulocytosis is a nonspecific erythropoietic response to anemia of any cause, and may not be seen initially in some patients. Differential diagnosis includes mostly paroxysmal cold hemoglobinuria and hereditary spherocytosis.

The onset of idiopathic warm or cold autoimmune hemolytic anemia may either precede or follow the diagnosis of a lymphoproliferative disorder. The following are the risk factors for development of lymphoproliferative disorder in this group of patients: advanced age, underlying autoimmune disease and the presence of a monoclonal IgM gammopathy. An increased risk for venous thromboembolism, occasionally fatal, has been described in adults with idiopathic autoimmune hemolytic anemia, especially those with concurrent HIV infection.

CONCLUSION

Our patient presented with breathlessness which was aggravated on exertion or activity and did not improve on taking rest. There was no significant medical history. She had severe pallor and icterus. Her hemoglobin was 2.8 g/dL, WBC count was 6,050 cells/mm^3, ESR was 45 mm at 1st hour, platelet count was 2 lakh cells/mm^3, PCV was 7. We immediately planned for 2 packed cell transfusion, but it could not be done because of cross-reaction.

Further tests were ordered and a final diagnosis of autoimmune hemolytic anemia (warm) was made. She was treated with oral and parenteral steroids and was kept under antibiotics coverage. No packed cell transfusion was done. This case is an excellent example of managing a patient with autoimmune hemolytic anemia without transfusing a single pint of blood. Her hemoglobin was corrected with the use of steroids only.

SUGGESTED READING

1. Ahmed I, Teruya J, Murray-Krezan C, Krance R. The incidence of autoimmune hemolytic anemia in pediatric hematopoietic stem cell recipients post-first and post-second hematopoietic stem cell transplant. Pediatr Transplant. 2015;19(4):391-8.
2. Young PP, Uzieblo A, Trulock E, Lublin DM, Goodnough LT. Autoantibody formation after alloimmunization: are blood transfusions a risk factor for autoimmune hemolytic anemia? Transfusion. 2004;44(1):67-72.
3. Hoffman PC. Immune hemolytic anemia - selected topics. Hematology Am Soc Hematol Educ Program. 2009;80-6.
4. Jones J. Transfusion in oligemia. In: Mollison PL, Engelfriet CP, Contreras M (Eds.). Blood Transfusion in Clinical Medicine, 8th Edition, Blackwell, Oxford; 1987. p. 41.
5. Roumier M, Loustau V, Guillaud C, Languille L, Mahevas M, Khellaf M, et al. Characteristics and outcome of warm autoimmune hemolytic anemia in adults: New insights based on a single-center experience with 60 patients. Am J Hematol. 2014;89(9):E150-5.
6. Sachs UJ, Röder L, Santoso S, Bein G. Does a negative direct antiglobulin test exclude warm autoimmune haemolytic anaemia? A prospective study of 504 cases. Br J Haematol. 2006;132(5):655-6.
7. Marchand A, Galen RS, Van Lente F. The predictive value of serum haptoglobin in hemolytic disease. JAMA. 1980;243(19):1909-11.
8. Sallah S, Wan JY, Hanrahan LR. Future development of lymphoproliferative disorders in patients with autoimmune hemolytic anemia. Clin Cancer Res. 2001;7(4):791-4.
9. Bartolmäs T, Salama A. A dual antiglobulin test for the detection of weak or nonagglutinating immuno-globulin M warm autoantibodies. Transfusion. 2010;50(5): 1131-1134.
10. Arndt PA, Leger RM, Garratty G. Serologic findings in autoimmune hemolytic anemia associated with immunoglobulin M warm autoantibodies. Transfusion. 2009;49(2):235-42.

11. Bardill B, Mengis C, Tschopp M, Wuillemin WA. Severe IgA-mediated auto-immune haemolytic anaemia in a 48-yr-old woman. Eur J Haematol. 2003;70(1):60-3.
12. Janvier D, Sellami F, Missud F, Fenneteau O, Vilmer E, Cartron J, et al. Severe autoimmune hemolytic anemia caused by a warm IgA autoantibody directed against the third loop of band 3 (RBC anion-exchange protein 1). Transfusion. 2002;42(12):1547-52.
13. Reusser P, Osterwalder B, Burri H, Speck B. Autoimmune hemolytic anemia associated with IgA - diagnostic and therapeutic aspects in a case with long-term follow-up. Acta Haematol. 1987;77(1):53-6.
14. Garratty G, Arndt P, Domen R, Clarke A, Sutphen-Shaw D, Clear J, et al. Severe autoimmune hemolytic anemia associated with IgM warm autoantibodies directed against determinants on or associated with glycophorin A. Vox Sang. 1997;72(2):124-30.
15. Saif MW, Bona R, Greenberg B. AIDS and thrombosis: retrospective study of 131 HIV-infected patients. AIDS Patient Care STDS. 2001;15(6):311-20.
16. Yusuf HR, Hooper WC, Grosse SD, Parker CS, Boulet SL, Ortel TL. Risk of venous thromboembolism occurrence among adults with selected autoimmune diseases: a study among a U.S. cohort of commercial insurance enrolees. Thromb Res. 2015;135(1):50-7.
17. Ungprasert P, Tanratana P, Srivali N. Autoimmune hemolytic anemia and venous thromboembolism: A systematic review and meta-analysis. Thromb Res. 2015;136(5):1013-7.

■■■■

WHO Head Points to 'Green Shoots of Hope' in COVID-19 Pandemic

While COVID-19 cases hit the 20 million mark worldwide, the chief of the WHO, Tedros Adhanom Ghebreyesus, has hinted at 'green shoots of hope'.

The WHO head has urged both governments and people across the globe to work to suppress the novel coronavirus. He stated that there are green shoots of hope and no matter where a country, a region, a city or a town is, there is still time to turn the outbreak around. He added that leaders have to step up to take action and citizens must follow the new measures… (*UN*)

29% of World's New COVID-19 Cases in India

New Delhi: India hit a new high on 9th August in its share of global COVID-19 case numbers. About 29% of all new cases and 21% of all deaths from coronavirus reported on the day were from India. India reported the largest share in the world numbers on the day in both the counts.

India's share of global cases so far this month has been the highest, with a cumulative count of 59,691 cases in the first 9 days of this month. The US recorded 4,93,376 cases during the same period and Brazil recorded 38,811 cases… (*ET Healthworld – TNN*)

FDA OKs New Opioid for Intravenous Use in Hospitals

The US FDA has granted approval to oliceridine, an opioid agonist to manage moderate-to-severe acute pain in adults, where the pain is severe enough to need an intravenous opioid and alternative treatments are inadequate.

Oliceridine is indicated for short-term intravenous use in hospitals or other controlled clinical settings, for instance, during inpatient and outpatient procedures. The drug is not indicated for at-home use. Controlled and open-label trials assessed the opioid in 538 patients with moderate-to-severe acute pain. It was compared to placebo in randomized, controlled studies of patients who underwent bunion surgery or abdominal surgery. Patients given oliceridine had decreased pain compared to placebo at the approved doses… (*FDA*)

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

Unilateral Atresia of Cervix Uteri and Uterus Didelphys in a Girl with Operated Congenital Pouch Colon

SANGEETA GUPTA*, TARU GUPTA†, AKSHAY SHARMA‡, PUSHPA BHATIA§, NUPUR GUPTA¶

ABSTRACT

This case report describes a girl with uterus didelphys with unilateral hematometra and hematosalpinx with congenital pouch colon (CPC) condition, where all or part of the colon is replaced by a pouch-like dilatation (5-15 cm in diameter), which communicates distally with the urogenital tract through a large fistula and associated with anorectal agenesis (supralevator anorectal malformation). CPC is seen in Asia and more specifically in northern India, Pakistan and Nepal. The management summary of this condition is creation of diverting colostomy at birth with or without the excision of pouch followed by pull through (abdominoposterior sagittal anorectoplasty) later on. The girl underwent similar procedure at birth and subsequent definitive surgery (pull through), to create a neoanus at 15 months of age. Subsequently since menarche, the child had severe cyclical abdominal pain, which on investigation was found due to hematometra and hematosalpinx in right-sided uterus. Laparotomy with removal of right-sided uterus and right fallopian tube was performed. Right-sided uterus had atresia of cervix uteri. This report emphasizes the need for comprehensive evaluation and a long-term management strategy for associated gynecologic anomalies in girls with CPC, especially with regard to patency of the outflow tract.

Keywords: Anorectal malformation, congenital pouch colon, cervical atresia, hematometra, uterus didelphys

Uterus didelphys with unilateral cervical atresia is an unusual mullerian duct anomaly with defect of vertical-lateral fusion. A well-known clinical association of congenital pouch colon (CPC) with genital anomalies exists.[1] At puberty, they present with incapacitating dysmenorrhea shortly after menarche. Similar findings in a girl with CPC have not been reported earlier in the literature.

CASE REPORT

A 10.5-year-old girl attended gynecology OPD with complaint of severe colicky abdominal pain since attainment of menarche. Pain was cyclical in nature occurring at monthly intervals. Periods were regular. There was history of multiple surgeries for associated CPC. On examination, there were three scars on abdomen. Available old records of child revealed that she was a diagnosed case of CPC, for which an emergency laparotomy with ileostomy was done at age of 5 days, followed by pull through to create a neoanus operation at age of 8 months and intraoperative findings suggested a type III CPC. Closure of colostomy was done at 2 years of age. Menarche was attained at the age of 10 years and she started having cyclical pain lower abdomen, unrelieved with medications. She was subsequently imaged in the private sector.

Ultrasound (whole abdominal and pelvis) showed both kidneys, uterus as normal and cystic mass in midline and towards right, 7 × 4 cm with internal echoes with a volume of 57 cc. Left ovary was normal. Contrast-enhanced computed tomography (CECT) abdomen showed a normal uterus with tubo-ovarian mass in right adnexa probably of infective etiology. CT urography and micturating cystourethrogram showed normal urethra and urinary bladder.

*Senior Consultant
†Associate Professor
‡Specialist
§Professor
¶Assistant Professor
Dept. of Gynecology and Pediatric Surgery, ESI-PGIMSR, New Delhi
Address for correspondence
Dr Taru Gupta
Associate Professor
Dept. of Gynecology and Pediatric Surgery
ESI-PGIMSR, Basaidarapur, New Delhi
E-mail: tarugupta1971@yahoo.com

Local examination showed normal perineum with patulous vagina and normally placed neoanus with visible rim of anal mucosa.

Magnetic resonance imaging (MRI) at our institute showed uterus didelphys with obstructing hemivaginal septum with right hematometra and hematosalpinx (Fig. 1). Left uterine cervix was identified while cervix could not be identified in right uterus. Right ovary was not visualized separately. Clinical diagnosis of mullerian duct anomaly, Class IV American Fertility Society (AFS) classification of uterovaginal anomalies, unusual configuration of vertical-lateral fusion was made. Lateral fusion defect of mullerian ducts may be the cause of uterus didelphys and vertical fusion disorder might have resulted in right cervical agenesis.

Examination under anesthesia showed a normal urethral orifice, patulous vagina and normally placed patulous neoanus. Per speculum examination showed normal vagina except a partial vaginal septum in the upper third of vagina. Normal well-developed cervix was present on left side. Menstrual blood was coming through the os. Per vaginum examination showed small-sized uterus in continuation with cervix on left side. On right side, no cervix could be felt, a firm mass of 5 × 4 cm was felt. Uterine sound was put through left cervical os into uterine cavity. Left uterocervical length was 6 cm.

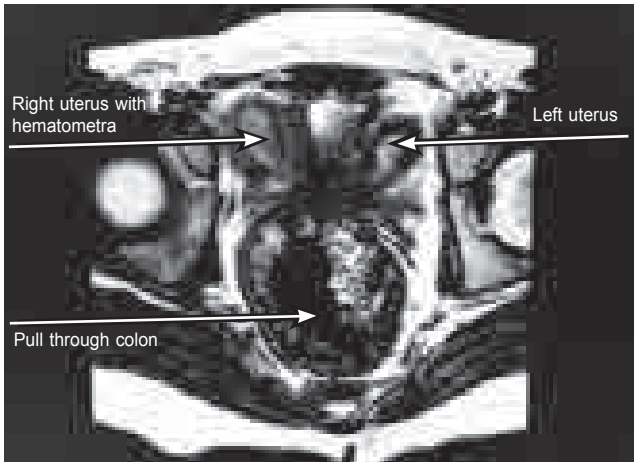


Figure 1. MRI pelvis showing uterus didelphys with obstructing hemivaginal septum with right hematometra and hematosalpinx.

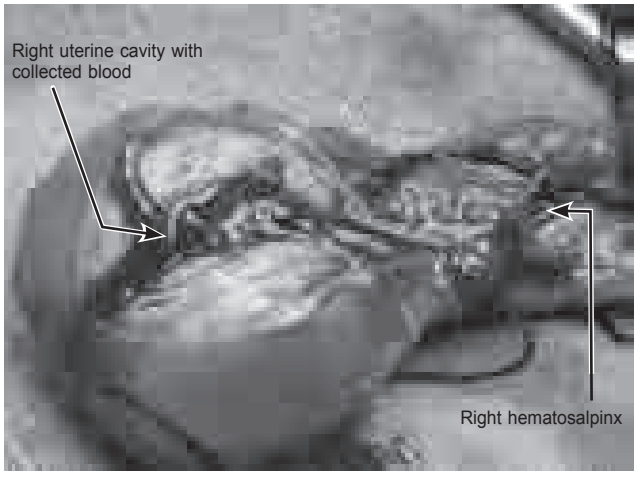


Figure 2. Cut section of removed right uterus with hematometra and hematosalpinx.

Laparotomy was done, which revealed uterus didelphys with right uterus distended with blood and a large right hematosalpinx. Right-sided ovary could not be visualized . Left-sided uterus, fallopian tube and ovary were normal. Removal of right-sided uterus and right hematosalpinx was done (Fig. 2 . There was complete cervical atresia on right side. The postoperative period was uneventful.

The histopathological examination confirmed right-sided hematosalpinx and right-sided uterus with no cervix.

DISCUSSION

Mullerian ducts represent the primordial components of the female reproductive system. They differentiate into fallopian tubes, uterus, cervix and superior aspect of vagina. Overall published data suggest prevalence of uterovaginal anomalies of 1-6%.[2] Complete failure of medial fusion of two mullerian ducts can result in complete duplication, partial failure of fusion can result in a single vagina with a single or duplicate cervix and complete or partial duplication of the uterine corpus. If uterine anomaly is associated with obstruction of menstrual flow, then it causes symptoms that will come to the attention of the gynecologist shortly after menarche.[3] Early diagnosis offers significant advantages in patient care.

Incapacitating dysmenorrhea shortly after menarche with regular menstrual periods in young girls can be due to unicornuate uterus with a noncommunicating rudimentary anlagen containing functional endometrium, unilateral obstruction of a cavity of a double uterus (complete septum), a clinical syndrome consisting of a double uterus, obstruction of vagina and ipsilateral renal agenesis or unusual configuration of vertical-lateral fusion defects Class IV AFS, as in our case where there was uterus didelphys with unilateral cervical atresia.

It is important to make diagnosis as soon as possible, because if lumen of tube communicates with functional

endometrial cavity and is patent at fimbrial end, then retrograde menstruation and pelvic endometriosis can develop, destroying reproductive potential. Removal of associated fallopian tube is strongly recommended to minimize risk of an ectopic pregnancy.[3] There are very few reports of uterus didelphys, a finding that appears to be invariable in girls with types I-III CPC.[4] Chadha et al described a girl with CPC, uterus didelphys with bilateral cervical atresia. At puberty, child had primary amenorrhea with severe cyclic abdominal pain due to hematometra, hematosalpinx and endometriosis. Laparotomy with removal of both uteri was done. Both uteri had atresia of cervix uteri.[5]

In a review on the subject of gynecologic concerns in girls with anorectal malformation (ARM), Breech[6] emphasized the role of vaginoscopy before puberty, preferably at the time of definitive repair of the ARM. Vaginoscopy allows evaluation of the vaginal anatomy and can also document the appearance, development and position of the cervices in vagina and the presence or absence of mucus at the ectocervix (to infer patency). Any underdevelopment of the Müllerian structures can be detected by serial US starting soon after the onset of breast development.[6] If neglected, onset of menarche in the presence of obstruction to the outflow tract may result in hematometra and/or hematocolpos, hematosalpinx, adnexal cysts, endometriosis and chronic abdominal pain.

CONCLUSION

In conclusion, our report emphasizes the need for a comprehensive evaluation and long-term management strategy for associated gynecologic anomalies in girls with CPC, especially with regard to the patency of the outflow tract. Uterus didelphys with a septate vagina appears to be invariable in girls with types I-III CPC[4] and needs to be assessed and managed appropriately with awareness of the possibility of obstetric complications in later life.[7,8] Therefore, it is strongly recommended that the parents of such patients are duly counseled and the entire case record with operative findings are to be preserved. It is also advocated that treating pediatric surgeon should team up with gynecologist for ideal long-term management.

REFERENCES

1. Gupta DK, Sharma S. Congenital pouch colon. In: Holschneider AM, Hutson J (Eds.). Anorectal Malformations in Children. Heidelberg: Springer; 2006. pp. 211-21.
2. Rock JA, Zacur HA, Dlugi AM, Jones HW Jr, TeLinde RW. Pregnancy success following surgical correction of imperforate hymen and complete transverse vaginal septum. Obstet Gynecol. 1982;59(4):448-51.
3. Rock JA, Breech LL. Surgery for anomalies of the Mullerian ducts. In: Rock JA, Jones HW (Ed.). Telinde's Operative Gynecology. Lippincott Williams & Wilkins; 2008. pp. 539-84.
4. Chadha R, Choudhury SR, Pant N, Jain V, Puri A, Acharya H, et al. The anomalous clinical anatomy of congenital pouch colon in girls. J Pediatr Surg. 2011;46(8):1593-602.
5. Chadha R, Puri M, Saxena R, Agarwala S, Puri A, Choudhury SR. Congenital pouch colon in a girl associated with bilateral atresia of cervix uteri and uterus didelphys. J Indian Assoc Pediatr Surg. 2013;18(2):81-3.
6. Breech L. Gynecologic concerns in patients with anorectal malformations. Semin Pediatr Surg. 2010;19(2):139-45.
7. Levitt MA, Bischoff A, Breech L, Peña A. Rectovestibular fistula-rarely recognized associated gynecologic anomalies. J Pediatr Surg. 2009;44(6):1261-7; discussion 1267.
8. Grimbizis GF, Camus M, Tarlatzis BC, Bontis JN, Devroey P. Clinical implications of uterine malformations and hysteroscopic treatment results. Hum Reprod Update. 2001;7(2):161-74.

■■■■

AHA Recommends Dietary Screening at Routine Checkups

A new scientific statement from the American Heart Association (AHA) has recommended the inclusion of a rapid diet-screening tool into routine primary care in order to guide dietary counseling. It also recommends integration of the tool into patients' electronic health record (EHR) platforms across all healthcare settings.

The authors evaluated 15 screening tools. While no specific tool was recommended, the authors put forward the advantages and disadvantages of some of the tools. They also encouraged conversations among clinicians and other specialists to determine a tool that would be most appropriate for use in a particular healthcare setting. The authors published the statement in *Circulation: Cardiovascular Quality and Outcomes*… (*Medscape*)

In Type 2 Diabetes Mellitus

℞ **VILDAPHAGE™**

Vildagliptin Tablets 50 mg

A Premium Anti-Diabetic for Every Indian

In Type 2 DM Patients Uncontrolled on Monotherapy

℞ **VILDAPHAGE-M™**

Vildagliptin and Metformin Hydrochloride Tablets 50 mg/500 mg

Reduction to Preservation

Also Available

℞ **VILDAPHAGE-M Forte™**

Vildagliptin & Metformin Hydrochloride Tablets 50 mg/1000 mg

DIABÉTIX

A Division of
FRANCO-INDIAN PHARMACEUTICALS PVT. LTD.

2020

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

Body Dysmorphic Disorder – Borderline Category Between Neurosis and Psychosis

K RAMAN*, R PONNUDURAI†, OS RAVINDRAN‡

ABSTRACT

Body dysmorphic disorder is an under-recognized chronic problem, which is established as an independent diagnostic entity. Its clinical features, comorbidity, course and prognosis have been studied in detail. But, the issue of its psychotic and nonpsychotic variants and the question of dimensional or categorical method of classifying this disorder still poses a diagnostic dilemma. This case report tries to highlight this issue.

Keywords: Body dysmorphic disorder, delusional and nondelusional variant

Body dysmorphic disorder (BDD) is an under-recognized chronic problem that is defined as an excessive preoccupation with an imagined or a minor defect of a localized facial feature or body part, resulting in decreased social, academic and occupational functioning. Studies have reported rates of BDD of 7% and 15% in patients seeking cosmetic surgery and a rate of 12% in patients seeking dermatologic treatment.[1] BDD has both psychotic and nonpsychotic variants, which are classified as separate disorders in Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) (delusional disorder and a somatoform disorder). Despite their separate classification, available evidence indicates that BDDs delusional and nondelusional forms have many similarities (although the delusional variant appears more severe), suggesting that they may actually be the same disorder, characterized by a spectrum of insight. In fact,i t is one of the diagnostic entities that falls on the borderline between neurotic and psychotic spectrum of disorders.

*Assistant Professor
†Professor and Head
‡Clinical Psychologist
Dept. of Psychiatry
Sri Ramachandra University, Porur, Chennai, Tamil Nadu
Address for correspondence
Dr K Raman
Assistant Professor
Dept. of Psychiatry
Sri Ramachandra University, Porur, Chennai -116, Tamil Nadu
E-mail: ramkrish_dr@yahoo.com

CASE REPORT

A 27 year-old male from middle socioeconomic status, was referred to psychiatry OPD from the plastic surgery department for clearance for rhinoplasty surgery. Patient was interviewed in detail and his history dated back to 17 years of age, when he was in his final year of schooling. He started noticing pimples and acne on his face, which embarrassed him to face his peers. He observed that few of them cleared, but few on the face left black marks and those on the nose turned into comedones. Most of them cleared with treatment from a dermatologist. But, the patient's concern with the healed scars on the face and nose started increasing and he started becoming preoccupied with them. He felt embarrassed in facing his classmates and would feel shy to face the public or relatives who would come to his house.

Patient adopted measures like covering his nose with his hands while speaking to others or while listening to the lectures in the class so that others do not watch it. Over time, he started developing rituals such as repeatedly watching his nose in the mirror, frequently washing his face after he returned back home from outside, would apply powder over the nose to cover up the imagined area of scars on the nose and had tried to reshape his nose on his own by using a stone, which resulted in bleeding and worsening of the condition.

Patient developed anxiety in social situations because of his referential thinking involving his imagined ugly appearance. He also developed misinterpretations of other people's behavior and comments linking them to his facial disfigurement. Patient spent enormous amount

of time and money in reshaping his nose, even at times stealing money from home. He developed depressed mood, death wishes and suicidal thoughts as a result of lack of improvement with treatment from various doctors. Patient had frequent change of jobs giving the reason as his inability to cope up with works involving social contact as a result of his ugly nose. He also started attributing his failures in academics and professional life to the imagined deformity in the nose. Patient did have recurrent suicidal ideation secondary to preoccupation with imagined deformity and occupational dysfunction, but there was no active attempt.

Patient did have history of stammering since childhood, which exacerbated after his social anxiety increased. He had history of alcohol and harmful tobacco use. Patient was the first among the five siblings. His mother used to be very critical of his appearance from his childhood. There was family history of stammering but there was no other significant mental illness in the family. He had a difficult temperament from his childhood although adequate information was not available.

At the time of presentation to us, patient had non-pervasive sad mood, decreased concentration in his work, significant social anxiety and avoidance of social situations due to referential thinking, stammering, strong beliefs that his nose is ugly and deformed (amounting to delusional level) with absent insight and attributed all his failures to the physical problem. There was significant impairment in social, occupational and academic functioning. There were obsessions related to contamination and compulsive washing, checking and obsessive images, blasphemous thoughts and sexual obsessions. Patient was diagnosed to have BDD - delusional variant with obsessive compulsive disorder mixed type, social anxiety disorder, dysthymia with mild depressive episode without somatic complaints and stammering according to DSM-IV criteria.

Psychometric Assessments

On Eysenck Personality Questionnaire, he was found to be a person of introvert personality getting high scores on neuroticism and low scores on psychoticism. On MiddleSex Hospital Questionnaire, he got significant scores on the scales of free-floating anxiety, phobia, obsession, somatization, depression and hysteria.

On Multiphasic Questionnaire, he got significant scores on the clinical scales of paranoid, psychopathic deviation, depression and anxiety. On Social Phobia Inventory, he got a score of 32 which is interpreted as extreme. On Beck's Depression Inventory, he got a score of 18 which is interpreted as mild.

On BDD-Y-BOCS (Yale Brown Obsessive Compulsive Scale modified for Body Dysmorphic Disorder), he got a score of 24 which is interpreted as moderate. Rorschach record with few popular responses, poor form level, rejection of responses at the time of inquiry, low number of FC responses, C + CF is greater than FC responses, unusual and bizarre responses, emphasis on major detail (D) responses and the presence of m responses is suggestive of a psychotic record with mixed features of anxiety and depression. Themes about sexual preoccupation, extramarital relations, pessimism, lack of assertiveness and delinquent behavior (lying) were brought out on TAT stories.

Treatment Plan

Contract was established with the patient about avoiding visits to other doctors of different specialties for the treatment of his deformity. His preoccupation with his stammering as one of the reasons for his failure in occupational functioning was taken as the target in the treatment. Patient was educated about his anxiety contributing to his stammering and he was started on progressive muscular relaxation. He was explained about the excess of compulsive rituals that he was performing and home-based exposure response prevention was initiated. He was started on sertraline and clonazepam and their doses were hiked up on subsequent visits. In view of the delusional component, low-dose of risperidone was started, in addition, during the course of treatment to observe for additional improvement. Since, there was no obvious improvement above that obtained with selective serotonin reuptake inhibitor (SSRI), it was stopped.

Patient is on continuous follow-up with us for the past 6 months. He reported of decrease in his social anxiety and intensity of stammering. His compulsive rituals also decreased except for mirror watching. His visits with other specialty doctors for change of nasal deformity were reduced to almost one visit in the above period. But, his belief about imagined nasal deformity was still at delusional level. Patient discontinued medications 15 days back and came with relapse of symptoms. He was restarted on medications and he was advised follow-up with his family member.

DISCUSSION

The patient discussed here presents as a prototype case of BDD described in various studies. As described in

various studies, the age of onset for the reported case was in adolescence and the duration between the onset of illness and contact with the mental health professional was almost 10 years during which period there were frequent visits to dermatologists and plastic surgeons. His premorbid personality assessment also showed a mixture of avoidant, paranoid and emotionally unstable personality (impulsive type) as observed in literature.[2]

Factors that may predispose persons to BDD include low self-esteem, critical parents and significant others, early childhood trauma and unconscious displacement of emotional conflict. They also have an earlier onset of major depression and higher lifetime rates of major depression (25%), social phobia (16%), obsessive compulsive disorder (8%) and psychotic disorder diagnoses, as well as higher rates of substance use disorders in first-degree relatives.[3,4] The reported case had comorbid obsessive compulsive disorder, social phobia with mild depression and stammering.

The co-presence of BDD and obsessive compulsive disorder features appears to possibly individuate a particularly severe form of the syndrome, with a greater load of psychopathology and functional impairment and a more frequent occurrence of other comorbid mental disorders.[5] Adults with BDD have markedly impaired functioning and notably poor quality-of-life.[2]

BDD may have a closely related psychotic subtype that significantly overlaps with, or may even be the same disorder as, the BDD variant of delusional disorder, somatic type. Although, the clinical features and phenomenology are almost similar to nondelusional BDD, delusional BDD patients have significantly lower educational attainment, are more likely to have attempted suicide, have poorer social functioning on several measures, are more likely to have drug abuse or dependence, are less likely to currently be receiving mental health treatment and have more severe BDD symptoms.[6]

The question arises as to include this category under neurotic or psychotic disorders or whether an intermediate category needs to be created for such disorders whose extreme severity results in a psychotic variant similar to obsessive-compulsive psychosis. This disorder has features predominantly of neurotic subtype such as its phenomenology similar to hypochondriasis and obsessive-compulsive disorder, comorbidity with anxiety spectrum disorders and good response to SSRIs. On the other hand, many earlier authors considered BDD a prodrome or variant of schizophrenia.[7]

Contrary to what might be expected, BDD's delusional form, although classified as a psychotic disorder, appears to respond to serotonin-reuptake inhibitors alone,[8] which questions its existence as a distinctive category under psychotic subtype. In addition, the delusional variant does not differ from the nondelusional variant on many of the measures except its severity, which might point to the existence of a single disorder.

The case of BDD discussed above had comorbid anxiety spectrum disorders with impaired insight and significant impairment in occupational functioning and quality-of-life in view of delusional component.

This necessitates the inclusion of poor insight or good insight specifiers and dimensional system of classifying such disorders. Although, the initial response to SSRI and anxiolytic showed significant improvement in his symptoms, during the course of illness, a low-dose of neuroleptic was added to augment the response but no added improvement was observed as quoted in the literature.

RECOMMENDATIONS

It is likely that a number of disorders span a spectrum from delusional to nondelusional thinking, with unlimited shades of gray in between. Future research may indicate that obsessional disorders such as BDD, anorexia, obsessive-compulsive disorder and hypochondriasis, as well as other disorders such as major depression, should have qualifiers or subtypes - for example, 'with good insight', 'with poor insight', and 'with delusional (or psychotic) thinking' - with an implied continuum of insight embraced by a single disorder.

Such approach will not only improve our classification system but also may have important treatment implications. For example, the preliminary finding that delusional BDD responds preferentially to SSRIs but not to neuroleptic agents contradicts conventional wisdom about the treatment of psychosis. Inclusion of a psychotic subtype for BDD should be considered for future editions of DSM.[9] These and other data suggest that a dimensional view of psychosis (in particular, delusions) in these disorders may be more accurate than DSMs current categorical view.

REFERENCES

1. Phillips KA, Dufresne RG Jr, Wilkel CS, Vittorio CC. Rate of body dysmorphic disorder in dermatology patients. J Am Acad Dermatol. 2000;42(3):436-41.

2. Veale D, Boocock A, Gournay K, Dryden W, Shah F, Willson R, et al. Body dysmorphic disorder. A survey of fifty cases. Br J Psychiatry. 1996;169(2):196-201.
3. Phillips KA, Gunderson CG, Mallya G, McElroy SL, Carter W. A comparison study of body dysmorphic disorder and obsessive-compulsive disorder. J Clin Psychiatry. 1998;59(11):568-75.
4. Gunstad J, Phillips KA. Axis I comorbidity in body dysmorphic disorder. Compr Psychiatry. 2003;44(4):270-6.
5. Frare F, Perugi G, Ruffolo G, Toni C. Obsessive-compulsive disorder and body dysmorphic disorder: a comparison of clinical features. Eur Psychiatry. 2004;19(5):292-8.
6. Phillips KA, Menard W, Pagano ME, Fay C, Stout RL. Delusional versus nondelusional body dysmorphic disorder: clinical features and course of illness. J Psychiatr Res. 2006;40(2):95-104.
7. Phillips KA, Menard W, Fay C, Weisberg R. Demographic characteristics, phenomenology, comorbidity, and family history in 200 individuals with body dysmorphic disorder. Psychosomatics. 2005;46(4):317-25.
8. McElroy SL, Phillips KA, Keck PE Jr, Hudson JI, Pope HG Jr. Body dysmorphic disorder: does it have a psychotic subtype? J Clin Psychiatry. 1993;54(10):389-95.
9. Phillips KA, Grant J, Siniscalchi J, Albertini RS. Surgical and nonpsychiatric medical treatment of patients with body dysmorphic disorder. Psychosomatics. 2001;42(6): 504-10.

■■■■

Zinc Supplementation should be Considered in the Combination of Chloroquine/Hydroxychloroquine Against COVID-19

The new severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has rapidly spread to nearly every country causing coronavirus disease-19 or COVID-19. At present, there are no approved vaccines or pharmaceutical treatments available for prevention or treatment of COVID-19 infection. Globally, social distancing and self-quarantine are the only protective measures to slow the rate of COVID-19 infections.

Zinc is a common stimulant of antiviral immunity. In COVID-19 morbidity and mortality, zinc deficiency could be significant for the outcome of patients with severe clinical courses including elderly patients, and patients with hypertension, coronary heart disease, diabetes or chronic obstructive lung disease. It is also speculated that younger adults or infants and adolescents with zinc deficiency might be at higher risk for SARS-CoV-2 infections. Hence, it is postulated that effective zinc supplementation during treatment of COVID-19 with chloroquine/ hydroxychloroquine (CQ/HCQ) that have zinc ionophore characteristics can result in increased intracellular zinc levels in general and in lysosomes. In patients who are at high risk in developing severe COVID-19 oral administration of adequate doses of zinc should be considered.

Supplementation of zinc is recognized to be clinically safe if dosing ranges and upper limits of dosing are based on suggested dietary allowances. In a randomized, double-blind, placebo-controlled trial, oral zinc supplementation with 45 mg zinc per day for 12 months confirmed a significant lower prevalence of infections in the elderly and it was well-tolerated.

Therefore, CQ/HCQ in combination with zinc should be considered in the treatment of COVID-19 patients as an added study arm for COVID-19 clinical trials.

Source: Derwand R, Scholz M. Med Hypotheses. 2020;142:109815.

Concussion Linked to Risk for Dementia, Parkinson's, ADHD

According to new research, published in *Family Medicine and Community Health*, a BMJ journal, concussion is linked with increased risk for subsequent development of attention-deficit/hyperactivity disorder (ADHD), as well as dementia and Parkinson's disease.

Investigators noted that the link between concussion and risk for ADHD and for mood and anxiety disorder was stronger in females than in males. History of multiple concussions made the association between concussion and subsequent mood and anxiety disorder, dementia and Parkinson's disease stronger, compared with history of just one concussion. The retrospective, population-based cohort study also revealed that controlling for socioeconomic status and overall health did not significantly affect this association… (*Medscape*)

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

An MBBS Doctor Admits a Patient Under Him and a Specialist Visits the Patient 1 or 2 Times. But, the Patient does not Change the File Name or Transfers the Case. Is This Correct or Incorrect?

KK AGGARWAL*, IRA GUPTA†

Yes, the treatment can be carried on by the MBBS doctor, even if the specialist visits the patient 1 or 2 times. Further, as per the provisions of **Regulation 3.6 of the Indian Medical Council (Professional Conduct, Etiquette & Ethics) Regulations, 2002,** it is the duty of the physician to prepare a case summary of the patient while referring the patient to the specialist and then the specialist should communicate his opinion in writing to the attending physician. The relevant provisions of **Regulation 3.6 of the Indian Medical Council (Professional Conduct, Etiquette & Ethics) Regulations, 2002** are reproduced hereunder:

"Chapter 3: Duties of Physician in Consultation

3.6 Patients referred to specialists: *When a patient is referred to a specialist by the attending physician, a case summary of the patient should be given to the specialist, who should communicate his opinion in writing to the attending physician."*

Further, there are certain responsibilities of the physician towards each other which are enumerated in **Chapter 4 of the Indian Medical Council (Professional Conduct, Etiquette & Ethics) Regulations, 2002,** which are reproduced hereunder:

"Chapter 4: Responsibilities of Physicians to Each Other

4.1 Dependence of physicians on each other: *A physician should consider it as a pleasure and privilege to render gratuitous service to all physicians and their immediate family dependants.*

4.2 Conduct in consultation: *In consultations, no insincerity, rivalry or envy should be indulged in. All due respect should be observed towards the physician in-charge of the case and no statement or remark be made, which would impair the confidence reposed in him. For this purpose no discussion should be carried on in the presence of the patient or his representatives.*

4.3 Consultant not to take charge of the case: *When a physician has been called for consultation, the Consultant should normally not take charge of the case, especially on the solicitation of the patient or friends. The Consultant shall not criticize the referring physician. He/she shall discuss the diagnosis treatment plan with the referring physician.*

4.4 Appointment of substitute: *Whenever a physician requests another physician to attend his patients during his temporary absence from his practice, professional courtesy requires the acceptance of such appointment only when he has the capacity to discharge the additional responsibility along with his/her other duties. The physician acting under such an appointment should give the utmost consideration to the interests and reputation of the absent physician and all such patients should be restored to the care of the latter upon his/her return.*

4.5 Visiting another Physician's case: *When it becomes the duty of a physician occupying an official position to see and report upon an illness or injury, he should communicate to the physician in attendance so as to give him an option of being present. The medical officer/physician occupying an official position should avoid remarks upon the diagnosis or the treatment that has been adopted."*

*President, HCFI
†Advocate and Legal Advisor, HCFI

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

Medtalks with Dr KK Aggarwal

CMAAO Coronavirus Facts and Myth Buster

COVID-19 Update

- An analysis of primary human lung cells that were infected in the lab with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) revealed how the cells accumulated large amounts of lipid droplets. Following infection, the lung proteins down-regulate the ability of lung cells to burn carbohydrates and fatty acids. Lung cells cannot hold fat. This could possibly explain some of the severe damage that is done to the lungs of patients with coronavirus disease 2019 (COVID-19). The virus depends on glucose uptake, cholesterol production and fatty acid oxidation. Additional research is needed on the cholesterol drug fenofibrate before clinical trials can start.
- The antihistamine cloperastine, mostly sold in Japan, tends to block glucose uptake in lung cells and has shown some effect in fighting COVID-19.
- Moderna's experimental COVID-19 vaccine led to a strong immune response and provided protection against infection in monkey study. The vaccine, mRNA-1273 when given to non-human primates provided protection against infection in the lungs and nose, and prevented pulmonary disease. Results of the study were published in the *New England Journal of Medicine*.

  It appears to be an improvement over the results of AstraZeneca's COVID-19 vaccine in a similar study. This study included 24 monkeys, where Moderna tested 10 μg or 100 μg of the vaccine against no treatment.

  Both doses were found to be effective in protecting against viral replication in the lungs and lung inflammation. The larger dose also protected against viral replication in the nose of the animals.
- A vaccine being developed by AstraZeneca and Oxford University is among the most advanced in human trials. In a similar animal study, this vaccine also appeared to prevent damage to the lungs and prevent the virus from replicating. However, the virus actively replicated in the nose.

SARS-CoV-2 Virus Shows Little Variability Regardless of Mutations

SARS-CoV-2 mutation rate continues to below. Strain G seems to be the most widespread across Europe and Italy. The L strain from Wuhan appears to be disappearing slowly. These mutations do not seem to influence the process of developing effective vaccines.

SARS-CoV-2 has been reported to present at least six strains. Despite the mutations, the virus has demonstrated little variability, which is a positive news for the researchers working on a viable vaccine.

These results come from the most extensive study ever done on SARS-CoV-2 sequencing.

Investigators at the University of Bologna analyzed 3543 coronavirus genomes, isolated by researchers in labs across the world. Investigators then mapped the spread and the mutations of the virus during its journey to all continents. The study was published in the journal *Frontiers in Microbiology*.

The first results are encouraging as they demonstrated that the coronavirus presents little variability, with about seven mutations per sample.

The variability rate of common influenza is more than double.

Federico Giorgi, a researcher at Unibo and study coordinator explained that the SARS-CoV-2 coronavirus seems optimized to affect human beings, thus explaining its low evolutionary change. This would mean that the treatments that are being developing, including a vaccine, might prove to be effective against all the virus strains.

There are six strains of coronavirus presently:

- The original - **the L strain** – that appeared in Wuhan in December 19
- Its first mutation - **the S strain** – that appeared at the beginning of 20
- **Strains V and G** – since mid-January 20

Strain G has been the most widespread till date. It mutated into **strains GR and GH** at the end of February 20

Strain G and its related strains GR and GH have been the most widespread till date, and account for 74% of all gene sequences that were analyzed in the study. These strains present four mutations, two of which can change the sequence of the RNA polymerase and Spike proteins of the virus. This could possibly have a role in facilitating the spread of the virus.

Strains G and GR seem to be most widespread across Europe and Italy. GH strain appears close to nonexistence in Italy, but is more widespread in France and Germany. This possibly validates the effectiveness of containment methods.

The most widespread strain in North America is GH, while GR strain occurs more frequently in South America.

In Asia, where the L strain initially appeared, the spread of G, GH and GR strains is gaining pace.

These strains came to Asia at the beginning of March, over a month after their spread in Europe.

On a global level, strains G, GH and GR are increasing. Strain S exists in some restricted areas in the US and Spain. L and V strains seem to be gradually disappearing. (*Science Daily*)

Minutes of Virtual Meeting of CMAAO NMAs on "Asian Countries Update – Part 1"

1st August, 2020 (9.30 am-10.30 am)

Participants: Member NMAs

Dr KK Aggarwal, President-CMAAO; Dr Yeh Wei Chong, Singapore Chair-CMAAO; Dr Marthanda Pillai, Member-World Medical Council; Dr Alvin Yee-Shing Chan, Hong Kong; Dr Subramaniam Muniandy, Malaysia; Dr Marie Uzawa Urabe, Japan; Dr Ashraf Nizami, Pakistan; Dr Prakash Budhathoky, Nepal

Invitees: Dr Russell D'Souza, UNESCO Chair in Bioethics, Australia; Dr S Sharma, Editor-IJCP Group

Dr Marthanda Pillai spoke about COVID situation in the Gulf countries. Dr KK Aggarwal analyzed the COVID data in South Asia and Dr Yeh Wei Chong gave an update on COVID in China, South Korea and Singapore. Dr Alvin Yee-Shing Chan spoke on the current scenario of COVID in Hong Kong.

COVID in Gulf countries

Dr Marthanda Pillai

- Many of the Gulf countries have been proactive in their response to COVID-19 launching tremendous efforts to control the infection prior to detecting the first case.
- Iran was the first country to be affected; it continues to be a hotspot.
- Saudi Arabia: Spread from Iran; disease detected in Jan/Feb, quick to implement measures to control the infection.
- UAE reported four cases on 29th January. Subsequently, Bahrain, Kuwait, Oman, Iraq and Qatar reported their first case in late February. These cases were either Iranians or citizens of Gulf countries who had recently visited Iran.
- Lockdown has been implemented, schools/religious places have been closed, no public transport in operation.
- There is a good system of testing.
- The entire treatment is free, especially COVID-19 treatment, for all citizens.
- Overall, total cases are around 23 lakh; the cure rate is around 54-68%. Mortality is less than 1%, except in Iran, where mortality is 2%.
- Non-COVID patients are restricted; e-prescriptions are being given, which has helped to control the infection.
- Restrictions are in place; there is no international travel except chartered flights for people who wish to go back to their country of origin. Their status is checked.
- The status of these countries has an indirect impact on the situation in our countries.

COVID-19 in South Asia

Dr KK Aggarwal

- The South Asian region includes 8 countries: Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka.
- If the population density is more, the number of cases will be more in the first wave. If density is more than 900 the number of cases is higher. Among the 5 countries, Bangladesh is the most densely-populated at 1,174/sq km. In all the rest, the density varies between 20 and 400.
- India has the maximum number of cases in the South Asia region.
- India, Pakistan and Bangladesh are almost the same in terms of total deaths per million population (20-25) and also same case fatality rate, which is around 2%. The total deaths per million population is 2 in Nepal; this may be because Nepal is yet to peak and spread is not yet seen.

- The situation in Sri Lanka is; however, different, despite similar population density. The case fatality rate is low (%) as is the total number of cases.
- Analysis of the indicators of health infrastructure shows that all 5 countries have almost similar number of physicians per 0 people. But in terms of hospital beds per 0 population, Sri Lanka has the highest number (6 ; in India, Pakistan, Nepal and Bangladesh, this number if 6 8
- Sri Lanka and India reported their first case of COVID-9 at nearly the same time; 2 h January and 8 h January, respectively.
- All 5 countries implemented lockdown around the same time, but Sri Lanka extended the lockdown much longer.
- More than 8% positive rate practically means community transmission and if less than 5% , then lockdown can be lifted. India, Pakistan and Bangladesh have more than 0 % positivity rate.
- Reasons for low mortality in Sri Lanka: First in the region to eliminate malaria, better hygiene index, educated population, better infrastructure, extended lockdown.
- Kerala has similar mortality as that of Sri Lanka (8%); total cases are 0 cases and only 4 deaths. The seroprevalence is less than 1% . The seroprevalence in Delhi and Mumbai and Pakistan is around 0 8% . In Bangalore, seroprevalence is 0 2% .

COVID-19 in China, South Korea and Singapore

Dr Yeh Woei Chong

- **China:** Confirmed cases 84,292 (discharged 78,974, deaths 4,634); cases have been rising from last 1 week. From 11th June to 23rd June, there were 256 cases in Beijing. Prior to this, there were no cases for 55 days. The trigger is a seafood market like in Wuhan and the source of infection apparently is contaminated chopping boards. China has a huge testing capacity; it is testing people in large numbers – half million tests daily. Outbreaks in Dalian and Xinjiang in the last week; the new outbreak in Dalian has been linked to a seafood company and contamination from packaging is suspected. On 30th July, there were 11 cases in Dalian and 112 in Xinjiang.
- **South Korea:** There are more than 14,000 confirmed cases; 8 have been discharged and around 8 have died due to the infection. There is a second wave in South Korea. The number of cases is increasing. There were 3 cases on 8 h July. South Korea has done 8 tests. Their clusters are nightclubs, door-to-door sales, churches, ports and nursing homes.
- **Singapore:** There are around 0 cases. Majority of cases in the country are in dormitories housing migrant workers (around 6 , while the community has only around 0 cases. Last week, there were 0 cases in dormitories and 5 in the community. Around 0 cases are in isolation. Since February, there are 8 ICU cases; this number has been er o since last 2 weeks. Number of tests performed is 1 million. There are 0 migrant workers in dormitories. Of these, 20 have recovered or cleared of the virus. Efforts are on to clear all the dormitories of COVID-9 by 7 h August. Migrant workers are swabbed every month towards this end. 7 factory dorms + 4 blocks in 7 purpose-built dorms have been cleared. Everybody is swabbed and if there are any cases, swabbed again after a week; 0 swab tests are done in a day.

Hong Kong Update

Dr Alvin Yee-Shing Chan

- Hong Kong is experiencing the third wave (July) with 1 cases and 2 deaths, which is serious; up to end of June, there were 0 cases and 8 deaths; in second wave in April, the maximum number was only 5
- Origin of the third wave is from sea men and air crew who were exempted from quarantine and routine testing together with relaxation of rules of social gathering and fatigue set in.
- No capacity for *en masse* testing; bottleneck of testing 0 daily; now screening started for high risk groups – people working in restaurants, catering, sellers, etc. No exemption now from testing and quarantine.
- Manpower is adequate; 8 9 doctors in public hospitals; only half of public hospital beds are occupied in the past 2 months as all elective surgeries have been postponed in public hospitals.
- T4 gene mutation was found in cluster of sailors entering Hong Kong from Kaak hstan and Philippines; this DNA expression is similar to that seen in many people in Hong Kong infected in the third wave. Patients became more serious and more infectious.
- Virology Department in the University of Hong Kong is working on research to produce a vaccine against COVID-9

- Holiday homes/villages/resorts have been modified as isolation and quarantine centers for mild cases to prevent cross infection to family members.

The Risk of COVID-19 Transmission in Train Passengers: An Epidemiological and Modelling Study

Despite the trains being one of the commonest modes of public transport across the world, the risk of COVID-19 transmission among individuals traveling by train remains ambiguous.

The study was conducted retrospectively to quantify the risk of spread of COVID-19 on high-speed train passengers. The data was collected from 23 index patients and 72 close contacts who traveled together for 0 8 hours from 1 h December, 19 through 6 h March, 20 in China. The researchers analyzed the spatial and temporal distribution of COVID-19 transmission among train passengers to assess the link between infection, spatial distance and co-travel time.

The study findings showed that the attack rate in train travelers on seats within a distance of 3 rows and 5 columns of the index patient varied from 0% to 8% with a mean of 0.325, while patients sitting in the same row seat as the index patient had an average attack rate of 15% . This was higher than those in other rows, with a relative risk of 2 The study clearly showed that patients sitting adjacent to the index patients were at the highest risk. The attack rate reduced directly in proportion with the increasing distance between the seats, but it increased with the increase in co-travel time.

The findings led to the conclusion that COVID-19 has a high infection rate among train passengers, but the risk significantly varies with co-travel time and location of the seat. Based on the study findings, the authors have recommended that during disease outbreaks, when traveling *via* public transport in restricted enclosures such as trains, adequate measures are necessary to lower the risk of spread of disease. These measures include increasing seat distance, reduced passenger density, and use of personal hygiene as protection.

Hu M, Lin H, Wang J, et al. Clin Infect Dis. 2020;ciaa1057.

Round Table Expert Zoom Meeting on "Consent in COVID Era – Need for Change"

1st August, 2020 (11 am-12 pm)

Participants: Dr KK Aggarwal, Dr AK Agarwal, Prof Mahesh Verma, Dr Ashok Gupta, Dr Shashank Joshi, Dr JA Jayalal, Dr Jayakrishnan Alapet, Dr Anil Kumar, Mrs Upasana Arora, Dr KK Kalra, Ms Ira Gupta, Dr Sanchita Sharma

Key Points from the Discussion

- COVID-19 has changed the scenario today. There is an inherent risk due to the changing nature of the virus.
- The requirements of presurgical patients are different; patients require more ICU stay.
- Institutes and hospitals must come out with new consent formats.
- Introducing the subject, Dr Kalra shared different modified formats of consent from the American Society of Plastic Surgeons and the Indian Journal of Surgery.
- Time has come to revisit consent. Consent should now be "fully" informed consent and not just informed consent and also include informed refusal.
- Blanket immunity may not work.
- There is now a need to shift from written informed consent to video, record consent in audio-visual format.
- There should be transparency in information provided to the patient. Include probable points so there will be no counterpoints. Make it "foolproof."
- The regular consent form in a pre-printed format is outdated. In a recent order in July, the National Consumer Disputes Redressal Commission (NCDRC) has held that the use of pre-printed consents forms is not valid.
- Consent should be in the patient's language, which he/she can understand. Consent will change in every counseling session.
- MCI Code of Ethics regulations specify that consent should be given by the patient or the spouse. In the COVID era, both husband and wife may be infected and may be hospitalized . So, now the "next of kin" should be identified for consent. Also, identify someone who will pay (guarantor).
- For a patient under isolation, the routinely taken consent may not be valid; it can be challenged on the grounds that the patient was under mental stress, etc.
- Shift from consent to agreement; now a detailed consent will be required, and every step should be recorded.
- The landmark Samira Kohli judgment took into consideration the Bolam's rule under which complications that occur 1% need not be informed to the patient/family. But now the definition of consent will change from this.

- Include the words "as on today" in the consent when giving information to the patient as new information about COVID is emerging almost every day.
- We need to define guidelines; they are not mandatory; treatment may change from the guidelines based on the professional competence of the treating doctor. This needs to be included in the consent. Guidelines inflict on professional autonomy.
- Define "off-label"; every treatment in COVID is off-label use.
- Declare death when brain death occurs; do not wait for the heart to stop – follow organ transplantation guidelines for this. Extended cardiopulmonary resuscitation (CPR) not allowed. Define the hours or how long will the body be kept in the hospital. Include such information in the consent.
- Include a clause for do-not-resuscitate (DNR).
- Put in a clause for compensation; write down your in-house redressal mechanism in case of a dispute.
- Include clause of good faith.
- Clearly define isolation rooms in the consent; in the western literature, isolation rooms mean negative pressure rooms.
- Define presymptomatic cases in consent as sometimes patient brought in is negative for COVID-19 but may become positive during hospitalization. This may become a dispute.
- Be transparent about charges (ethical); whether insurance will cover or not.

Re-testing Positive

RT-PCR can be Redetected But not Re-positive

- A positive real-time reverse transcriptase-polymerase chain reaction (rRT-PCR) antigen test is highly accurate, pointing to the presence of SARS-CoV-2 RNA.
- There seems to be no significant cross-reactivity with other respiratory viruses or other coronaviruses.
- A study from Korea suggests that patients with persistent positive tests, beyond 10 days from the initial positive test, who do not have any symptoms are no longer infectious.
- For patients with a high suspicion of COVID-19, a negative test should not exclude the infection.
- The number of false-negative results is not clearly known, though the resultant risk is high.
- Several factors affect the odds of a false-negative test, such as the time when the sample was collected in relation to the timing of illness and the type of specimen collected.
- Nasopharyngeal swabs are likely more accurate compared to nasal or throat specimens.
- Repeat or serial testing enhances the sensitivity; however, it may not always be available.
- rRT-PCR is the current standard, yet, more inclusive consensus-based criteria would possibly be introduced due to the concern about false-negative results.
- Patients who are discharged from isolation after recovery and who again test positive for SARS-CoV-2 are not likely to be infective, suggests a report from the Korea Centers for Disease Control and Prevention (KCDC).
- There's no relapse.
- The disease is known to linger and to affect more than one system of the body. But, other viral diseases, such as influenza and mononucleosis, also work the same way.
- As of May 15, researchers in Korea had identified 47 patients who tested positive again on RT-PCR testing for viral RNA. Of these, 81% patients had undergone epidemiologic investigation and contact investigation. Of those tested, 63% were tested for screening purposes and 37% were tested as they had symptoms. About 24% of the 38 patients who underwent investigation were symptomatic.
- Data obtained from three groups of patients from different cities revealed that 25.9-48.9% of the patients again tested positive after discharge.
- Among the 21 symptomatic patients, when their case was initially confirmed, a repeat positive test result after discharge was noted an average of 9 days from the date of initial symptom onset. The average duration from the time of discharge to the time of the second positive test was 4 days.
- Nearly 63% of patients who tested positive a second time underwent a test for screening purposes, irrespective symptoms. Of those who again tested positive, 24% had symptoms such as cough and sore throat.
- In order to ascertain if a positive result on a second test was associated with infectivity, researchers assessed 79 contacts of the 38 patients who tested positive a second time. Of these, 5 were family members and 9 were others. Among the

contacts, 3 new cases were detected. But for these 3 patients, other sources of infection were possible, including religious groups or family groups in which there were persons who were confirmed to have COVID-19.

- The researchers tried to culture virus from 8 patients who tested positive a second time; all such cultures were negative.
- First and second serum samples were obtained from 25 patients who had tested positive a second time. About 93% of these tested positive for neutralizing antibodies.
- Active monitoring, epidemiological investigation, and laboratory testing of re-positive cases and their contacts showed no evidence to indicate infectivity of re-positive cases.
- Patients who have been discharged from isolation do not require further testing and are not likely to be infective, despite again testing positive on RT-PCR assay.
- The patients will no longer be considered as 're-positive cases' but as 'PCR re-detected after discharge from isolation'.

Medscape excerpts

RT-PCR Memory T Cells

A spurt of new studies has shown that a large proportion of the population — at some places, around 20–50% of people — might carry T cells that identify the new coronavirus despite having never encountered it before. Although it's too early to ascertain how helpful they might be, but even a slight influence on immune response could make the disease milder.

While the new coronavirus was unknown until 8 months back, yet to some human immune cells, it was already something familiar.

This could be a case of family resemblance. For the immune system, pathogens with common roots can look alike, such that when a similar pathogen comes to call, the body may already have a clue of its intentions.

The presence of T cells has fascinated the experts, who state that it is too early to be able to tell if the cells will play a helpful, harmful or negligible role against the new coronavirus.

However, if these T cells exert even a modest influence on the body's immune response, the disease might become milder. This could, in part, explain why some people become very sick while others don't. (*New York Times Excerpt*)

SARS-CoV-2-specific T-cell immunity in COVID-19, SARS and uninfected controls

Memory T cells that are induced by previous pathogens can build the susceptibility to, and clinical severity of, subsequent infections. There is limited information about the presence of pre-existing memory T cells in humans with the potential to recognize SARS-CoV-2

In a recent paper published in *Nature*, researchers assessed T-cell responses to structural (nucleocapsid protein, NP) and nonstructural (NSP-7 and NSP13 of ORF1) regions of SARS-CoV-2 in 36 COVID-19 convalescents. Investigators noted the presence of CD4 and CD8 T cells recognizing multiple regions of the NP protein in all of them. Twenty-three SARS-recovered patients were still found possess long-lasting memory T cells that were reactive to SARS-NP nearly 17 years after the 2003 outbreak, showing strong cross-reactivity to SARS-CoV-2 NP.

SARS-CoV-2 specific T cells were also identified in individuals with no history of SARS, COVID-19 or contact with SARS/COVID-19 patients (n = 37).

SARS-CoV-2 T cells detected in uninfected donors had a different pattern of immunodominance, frequently targeting the ORF-1 coded proteins NP7 and 13 as well as the NP structural protein.

Epitope characterization of NSP7-specific T cells exhibited recognition of protein fragments with low homology to 'common cold' human coronaviruses, but it was conserved amongst animal beta-coronaviruses.

Therefore, infection with beta-coronaviruses tends to induce multi-specific and long-lasting T-cell immunity to the structural protein NP.

Understanding how pre-existing NP- and ORF-1 specific T cells present in the general population affect the vulnerability and pathogenesis of SARS-CoV-2 infection is important for the management of the COVID-19 pandemic.

Le Bert N, Tan AT, Kunasegaran K, et al. Nature. 2020;584(7821):457-62.

■■■■

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

News and Views

Long Sleep or Sleep Apnea in Middle Age Double Risk for AD

Middle-aged individuals with sleep apnea or who get ≥9 hours of sleep at night have over twofold increased risk of developing Alzheimer's disease (AD) within about 6 years, suggests new research.

A UK Biobank study of over 8000 individuals suggested that excessive daytime sleepiness had a link with increased risk for AD. When compared with individuals who got an average of 6–9 hours of sleep every night, those who got more than 9 hours of sleep had a higher risk for AD (hazard ratio [HR], 2.04; 95% confidence interval [CI], 1.56-2.67; $p < 0.001$). The findings were presented at the virtual Alzheimer's Association International Conference (AAIC) 20… (*Medscape*)

Kids' Noses may have More COVID-19 Virus Than Adults'

Young children below the age of 5 years with mild-to-moderate coronavirus disease 19 (COVID-19) were found to have high amounts of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in their upper respiratory tract compared to adults or older children in a new research.

In a cohort of 145 patients less than 1 month of age to 65 years separated by age, investigators noted that the youngest children had significantly lower median cycle threshold (CT) values in comparison with older children or adults. This indicates that they had equivalent or more viral nucleic acid in the upper respiratory tract versus other age groups. According to the findings published in *JAMA Pediatrics*, there was a 10- to 100-times greater amount of SARS-CoV-2 in the nasopharynx of young children. However, researchers stated that the findings were limited to detection of viral nucleic acid and not infectious virus… (*Medpage Today*)

Smoking Tied to Increased Risk for Unruptured Aneurysm

Women who smoke cigarettes have an increased risk of having intracranial aneurysms, revealed a new study published online in *The Journal of Neurology, Neurosurgery and Psychiatry*.

The case-control study of over 500 women aged 30-60 years revealed that those with a history of smoking had about 4 times increased risk of having an unruptured intracranial aneurysm (UIA) in comparison with women without a history of smoking. Chronic hypertension was found to be associated with a threefold increased risk for UIA, compared with normotension… (*Medscape*)

It is OK to Treat Many Cancer Patients Despite Pandemic

During the ongoing COVID-19 pandemic, cancer treatment should not be discontinued or delayed if it has the potential to impact overall survival, according to new recommendations from the European Society of Medical Oncology (ESMO).

The society also recommends against labeling all patients with cancer as being vulnerable to infection with the virus as it can result in inappropriate care with negative outcomes. The recommendations are aimed at guiding physicians to optimize the pathway to cancer care besides improving outcomes during the pandemic. The recommendations are published online in the *Annals of Oncology*… (*Medscape*)

Russia Preparing Mass Vaccination Against Coronavirus for October

Moscow: According to local news agencies, Russia's health minister is preparing a mass vaccination campaign against the novel coronavirus for October, after a vaccine completed clinical trials.

Health Minister Mikhail Murashko said that a state research facility in Moscow had completed clinical trials of the vaccine and paperwork was on to get it registered. According to the minister, doctors and teachers would be the first to receive the vaccination. According to a source, Russia's first potential COVID-19 vaccine would obtain local regulatory approval in August and would be administered to health workers soon thereafter… (*Reuters*)

DCGI Approval to Serum-Oxford COVID-19 Vaccine for Phase 2, 3 Clinical Trials

New Delhi: The Serum Institute of India (SII) has received permission from the Drugs Controller General of India (DCGI) to conduct phase 2 and 3 human clinical

trials in India on the potential COVID-19 vaccine, stated a senior government official.

It is following an extensive evaluation that the DCGI has granted approval to SII to perform phase 2 and 3 clinical trial based on the recommendations of the Subject Expert Committee (SEC), mentioned the official. According to the study design, all subjects will receive two doses 4 weeks apart - first dose on Day 1 and second dose on Day 29 – followed by assessment of the safety and immunogenicity at predefined intervals… (*ET Healthworld – ANI*)

Common Causes of Pediatric Allergic Contact Dermatitis

The leading three contact allergens in patients below 18 years of age include hydroperoxides of linalool, nickel sulfate and methylisothiazolinone, suggests an analysis of data from the Pediatric Allergic Contact Dermatitis Registry.

This registry is the first multicenter prospective database in the United States focusing on pediatric allergic contact dermatitis. Investigators obtained data on 281 patients below 18 who were referred for an evaluation of allergic contact dermatitis at one of the 10 participating sites from January 2018 through June 2019. The mean number of allergens patch tested per child was 37. Nearly 80% of the children had one or more positive patch test reactions, with the rate being more or less similar among those with and without a history of AD (80% vs. 82%, respectively). The five top allergens were hydroperoxides of linalool (25%), nickel sulfate (19%), methylisothiazolinone (17%), cobalt chloride (13%) and fragrance mix I (12%). The findings were presented at the virtual annual meeting of the Society for Pediatric Dermatology… (*Medscape*)

Moist Heat Treatment of N95 Masks Eliminates COVID-19, Says Study

Moist heat treatment of N95 masks tends to eliminate the novel coronavirus, suggest scientists.

The study revealed that moist heat treatment of masks for 60 minutes at 70 °C in a humid condition did not impair their structure or impact function. According to investigators, this low-cost reprocessing strategy could be applied 10 times without affecting the mask's filtration, breathing resistance, fit and comfort. This strategy could possibly help curb the global shortage of masks during the pandemic. The findings are published in the *Canadian Medical Association Journal (CMAJ)*… (*HT – PTI*)

Postmenopausal Estrogen Alone Reduces Breast Cancer Cases and Deaths

A follow-up study of menopausal hormone therapy has revealed that prior use of conjugated equine estrogen (CEE) led to a reduction in both breast cancer incidence as well as mortality, while prior use of CEE plus medroxyprogesterone acetate (MPA) was tied to an increase in incidence.

To explore the outcomes of the Women's Health Initiative for hormone therapy and breast cancer risk, investigators assessed the long-term follow-up of two randomized trials involving 27,347 postmenopausal women with no prior breast cancer and negative mammograms at baseline. An analysis done in 2018 revealed that CEE alone was associated with lower risk of breast cancer while CEE plus MPA was associated with increased risk. The present analysis confirmed that following a median follow-up of 20 years, and with mortality data available for over 98% of participants, CEE alone was linked with fewer cases of breast cancer compared with placebo. Additionally, CEE alone was also associated with lower mortality compared with placebo. Contrary to that, CEE plus MPA was associated with more cases of breast cancer than placebo and no statistically significant difference could be seen between CEE plus MPA and placebo for mortality. The study is published in *JAMA*… (*Medscape*)

Efficacy and Safety of a Polyherbal Formulation in Alcoholic Liver Cirrhosis

A study was conducted to determine the clinical efficacy and safety of a polyherbal formulation containing *Capparis spinosa, Cichorium intybus, Solanum nigrum, Cassia occidentalis, Terminalia arjuna, Achillea millefolium* and *Tamarix gallica*, in alcoholic liver cirrhosis.

This open clinical trial enrolled patients suffering from early alcoholic cirrhosis. Patients with evidence of esophageal varices, hepatic encephalopathy and malignant jaundice, and pregnant women were excluded from the study. A thorough history was obtained, and symptomatic evaluation and clinical examination were carried out for all patients prior to treatment and during follow-up visits every month till the end of treatment after 6 months. Liver function tests, hemogram and other biochemical tests were conducted at baseline and at the end of the study. The primary endpoints included rapid relief from clinical symptoms and physical signs along with improvement of efficacy biochemical parameters. The secondary endpoints included short- and long-term safety, and overall compliance to the drug treatment.

Fifty patients were enrolled in the trial. There was a significant reduction in the clinical symptom scores for asthenia, easy fatigability, tiredness, nausea, anorexia, abdominal discomfort, abdominal pain, stool frequency and muscle cramps; as well as in the physical sign scores of muscle wasting, jaundice, anemia, edema, ascites and hepatomegaly. There was a significant decrease in liver function test parameters including alanine transaminase, aspartate transaminase, total bilirubin, alkaline phosphatase, albumin and prothrombin time at the end of 6 months of treatment with the herbal formulation. No clinically significant adverse events were noted during the study.

This polyherbal formulation thus seems to be clinically safe and effective in the management of alcoholic liver cirrhosis.

Source: Agal S, Prasad SR, Mitra SK. Medicine Update. 2007;15(6):25-32.

Breastfeeding Link to COVID-19 Negligible: WHO

The World Health Organization (WHO) has stated that the risk of COVID-19 infection from breastfeeding is negligible and has never been documented. The agency urged for greater support for the practice of breastfeeding.

The appeal comes during the ongoing World Breastfeeding Week, as WHO cautions that not using mother's milk is tied to 8,20,000 child deaths a year, at a cost of $300 billion to the global economy. Dr Laurence Grummer-Strawn, head of the WHO's Food and Nutrition Action in Health Systems unit, stated that they have never come across any COVID-19 transmission through breast milk anywhere across the world. As per WHO, exclusive breastfeeding for 6 months has several benefits for the infant and the mother which outweigh the risk from the new coronavirus pandemic… (*UN*)

CDC Anticipates 2020 Outbreak of Life-threatening Acute Flaccid Myelitis

The Centers for Disease Control and Prevention (CDC) is anticipating that 2020 will represent another peak year for cases of acute flaccid myelitis (AFM).

This uncommon but serious neurologic condition that mostly affects children, has peaked every 2 years from August to November in the United States since 2014. CDC has released a new CDC Vital Signs report to alert healthcare providers to a possible outbreak in 2020. Parents and doctors are advised to suspect AFM in patients with sudden limb weakness, particularly from August through November. Recent respiratory illness or fever and neck or back pain or any neurologic symptom should increase their concern… (*CDC*)

Sero Survey Covers All 11 Districts in Delhi

New Delhi: The second serological survey in Delhi that began with four districts and spread to eight over the next 2 days, has covered all 11 districts.

Adequate blood samples have been collected to ascertain the prevalence of COVID-19 antibodies in Delhiites and the target of 10,000 samples will be met recently, stated a government official. The first survey in the capital that was conducted by Delhi government from June-end to the first week of July, had shown the presence of COVID-19 antibodies in nearly 23% of the total 8,500 samples collected… (*ET Healthworld – TNN*)

No Increase in Diabetes Risk with Rheumatoid Arthritis

Patients with rheumatoid arthritis (RA) had no increased risk for developing type 2 diabetes, reported a large population-based cohort study.

The HR for incident type 2 diabetes among RA patients was 0.72 (95% CI 0.66-0.78) in comparison with the general non-RA population, reported researchers in *Arthritis Care & Research*. It was noted that the odds of developing type 2 diabetes were 24-35% lower among RA patients, when compared with those with hypertension, osteoarthritis and psoriatic arthritis. Over median follow-up times varying from 1.4 to 1.8 years, diabetes diagnoses were reported among 2,091 in the RA group, 1,828 in the general non-RA group, 3,012 in the hypertension group, 1,802 in the osteoarthritis group and 366 in the psoriatic arthritis group, with crude incidence rates being the highest in the hypertension and psoriatic arthritis groups and lowest in RA group… (*Medpage Today*)

COPD Patients with Sleep Problems should be Screened for Mood Disorders

A robust link has been found between sleeping disturbances and depression in patients with chronic obstructive pulmonary disease (COPD) in a study published in the *Clinical Respiratory Journal*.

Researchers noted that adults with clinically stable COPD who had sleep problems had a significantly higher likelihood of reporting depression or anxiety, poor self-efficacy and poor health-related quality of life, in comparison with those not having sleep problems. Worse sleep in these patients was found to be associated with worse scores on measures of mood… (*Medscape*)

Novavax Signs COVID-19 Vaccine Supply Deal with Serum Institute of India

Novavax Inc has stated that it has signed a supply and license agreement with the Serum Institute of India for the development and commercialization of its COVID-19 vaccine candidate.

The exclusive rights for the vaccine in India will be with the Indian drugmaker during the term of the deal. It will also have nonexclusive rights during the period of the pandemic in all countries except the ones characterized as upper-middle or high-income countries by the World Bank.

Novavax had recently reported that its experimental COVID-19 vaccine led to the production of high levels of antibodies against the novel coronavirus in a small, early-stage clinical trial. A large pivotal Phase III trial is expected to begin by late September… (*Reuters*)

Most Patients Who Recovered from COVID-19 in Wuhan Suffer Lung Damage

About 90% of a sample group of patients who had recovered from the novel coronavirus from a prominent hospital in Wuhan, China, have reported lung damage. About 5% of them are again in quarantine after testing positive for the virus.

Investigators at the Zhongnan Hospital of Wuhan University have been conducting follow-up visits with 100 recovered patients since April. The first phase of the 1-year program, which finished in July, revealed that 90% of the patients still had lung damage. This suggests that their lungs' ventilation and gas exchange functions have not yet recovered to the level of healthy individuals, reported the state-run *Global Times*. It was also noted that the antibodies against the coronavirus in 10% of the 100 patients have disappeared… (*ET Healthworld*)

People Dying After Drinking Hand Sanitizer: CDC

People are getting sick and some even dying after swallowing hand sanitizer , said the US CDC recently. Four individuals had died and others had suffered impaired vision or seizures, stated the CDC.

While hand sanitizer is useful for cleaning the hands during the coronavirus pandemic, it is not safe to swallow, warns the CDC. A CDC team reported about 15 adults in Arizona and New Mexico who have been hospitalized for methanol poisoning after consumption of alcohol-based hand sanitizers from May through June.

The US Food and Drug Administration (FDA) has also constantly warned about methanol in some hand sanitizers available in the United States. The agency has warned against over 100 hand sanitizer products… (*CNN*)

PCOS Tied to a Twofold Risk of Developing Psoriasis

Polycystic ovarian syndrome (PCOS) was found to be associated with about a twofold risk of developing psoriasis in a propensity score-matched analysis, presented at the virtual annual meeting of the Group for Research and Assessment of Psoriasis and Psoriatic Arthritis.

Overall, 1 million randomly selected records from Taiwan's Longitudinal Health Insurance database were analyzed. From 2000 through 2012, a case group with at least three outpatient diagnoses or one inpatient diagnosis of PCOS was identified. Each was then compared with 4 patients without PCOS, matched by age and index year. Comorbidities were found to be higher in the PCOS patients, including asthma (6.7% vs. 4.9%), COPD (14% vs. 11%), chronic liver disease (8.0% vs. 5.0%), diabetes mellitus (3.0% vs. 1.4%), hypertension (2.4% vs. 1.5%), hyperlipidemia (5.4% vs. 2.5%), depression (5.4% vs. 3.9%) and sleep apnea (0.23% vs. 0.10%). Investigators noted a higher cumulative incidence of psoriasis in the PCOS group. Other factors that were linked with increased risk of psoriasis included advanced age (>50 years old; adjusted HR [aHR], 14.13; 95% CI, 1.8-110.7) and having been diagnosed with cancer (aHR, 11.72; 95% CI, 2.87-47.9)… (*Medscape*)

Are Skin Rashes a Clue to COVID-19 Vascular Disease?

Some rashes seen in severe COVID-19 patients may be a clinical clue to an underlying thrombotic state, suggest researchers.

Four patients with severe illness at two New York City academic medical centers developed livedoid and purpuric rashes, that were associated with elevated D-dimer levels and suspected pulmonary emboli, reported researchers in *JAMA Dermatology*. All the patients were receiving prophylactic anticoagulation since admission and developed the hallmark manifestations of cutaneous thrombosis in spite of an increase to therapeutic dose anticoagulation for the suspected pulmonary embolism before the rash appeared… (*Medpage Today*)

The Potential Effect of Zinc Supplementation on Pathogenesis of COVID-19

New and original therapeutic options against coronavirus disease are urgently anticipated in the

ongoing current COVID-19 pandemic. Because of its rapid spread and vast number of individuals affected worldwide, cost-effective, universally available, and safe options with least side effects and simple use are extremely necessary.

In this review, the potential use of zinc as preventive and therapeutic agent alone or in combination with other schemes are discussed. Generally, zinc meets the above described criteria effortlessly. Although several data on the association of the individual zinc status with viral and respiratory tract infections are available, study data regarding coronavirus infection is missing.

However, it can be assumed as it is indicated by others and is detailed in this viewpoint, while focusing on re-balancing of the immune response by zinc supplementation.

Till now, the role of zinc in viral-induced vascular complications has rarely been discussed. Remarkably, most of the high risk groups that are described for COVID-19 are also associated with zinc deficiency. Zinc is essential to preserve natural tissue barriers of the respiratory epithelium, inhibiting pathogen entry, for a balanced role of the immune system and the redox system. Zinc deficiency can possibly be added to the factors affecting individuals to infection and harmful progression of COVID-19.

In conclusion, because of the zinc's direct antiviral properties, it can be expected that zinc supplementation is beneficial for most of the population, particularly in those with suboptimal zinc level.

Source: Wessels I, Rolles B, Rink L. Front Immunol. 2020;11:1712.

Global Cooperation Must for Fight Against COVID-19: WHO

Director-General of the WHO, Tedros Adhanom Ghebreyesus, has urged countries to unite in the fight against COVID-19.

While addressing the Aspen Security Forum, he stated that the security of all humans living on this planet is interdependent and that no country will be safe until all the people are safe. He urged world leaders to cooperate and act to end the pandemic. "It's the right choice and it's the only choice we have," he added. He also cautioned against vaccine nationalism.

He stated that for fair distribution to take place, there has to be a global consensus to make a vaccine, a global public product… (*UN*)

New Drug Shows Dramatic Recovery in COVID-19 Patients with Respiratory Failure

Houston: RLF-100 also known as aviptadil, has been found to result in rapid recovery from respiratory failure in critically ill COVID-19 patients by doctors at a hospital in Houston.

The drug has received approval from the FDA for emergency use in patients who are too ill to enter the FDA's Phase 2/3 trials. Houston Methodist Hospital has been the first to report that the drug led to rapid recovery in patients on ventilators as well as those with severe medical conditions after 3 days of treatment. The drug includes Vasoactive Intestinal Polypeptide (VIP), which is seen in high concentrations in the lungs and blocks several inflammatory cytokines… (*ET Healthworld – PTI*)

In Canada, Obesity No Longer to be Determined by Weight Alone

Physicians in Canada issued new guidelines that urge doctors in the country to take a new approach in the way patients with obesity are treated.

The guidelines, published in the *Canadian Medical Association Journal*, recommend that obesity should be classified as a chronic illness that needs customized treatment and long-term care. The authors urge doctors not to rely on body mass index (BMI) alone while diagnosing their patients. According to Dr Arya Sharma, co-author of the guidelines, people would be diagnosed as obese if their body weight has an impact on their physical health or mental well-being… (*CNN*)

Asymptomatic COVID-19 Patients may Shed Virus Longer

Viral loads have been found to be similar among asymptomatic and symptomatic COVID-19 patients and continued to be that way for weeks following diagnosis, revealed South Korean researchers.

A study of around 60 patients with positive polymerase chain reaction (PCR) tests for SARS-CoV-2 has revealed that asymptomatic patients had a slightly shorter median time to negative conversion compared to symptomatic patients (17 vs. 19 days, respectively, p = 0.07). However, CT values in PCR tests for lower respiratory tract samples suggested that viral loads remained more or less same or decreased more gradually in the asymptomatic individuals from diagnosis to discharge from isolation, reported researchers in *JAMA Internal Medicine*… (*Medpage Today*)

Vitamin D may have a Role in Reducing Recurrence of Positional Vertigo

According to a randomized trial published in *Neurology*, daily supplementation with vitamin D and calcium carbonate could significantly decrease the recurrence of benign paroxysmal positional vertigo (BPPV), more so in patients with low serum vitamin D levels.

Investigators stated that vitamin D and calcium supplementation could be the first medical treatment to prevent the recurrence of positional vertigo. The study had 54 patients in the intervention group and 32 in the observation group who completed at least 1 month of follow-up. The number of recurrences per one person-year was found to be 0.8 in the intervention group compared to 1.0 in the observation group, with an incidence rate ratio (IRR) of 0.7 and a decrease in the annual recurrence rate of 0.2 with supplementation… (*Medscape*)

Protective Effect of Zinc Supplementation During COVID-19

The hunt for potential protecting and therapeutic antiviral approaches is very essential and urgent due to the evolving COVID-19 pandemic worldwide, which is caused by SARS-CoV-2 virus, also known as coronavirus. Zinc is identified and considered to modulate antiviral and antibacterial immunity and also regulate the inflammatory response. Regardless of the lack of available clinical data, certain indications do suggest that modulation of zinc status might be beneficial in COVID-19.

Zinc is involved in a variety of biological processes and also in the regulation of carbohydrate and lipid metabolism, functioning of the reproductive, cardiovascular and nervous system. The most important role of zinc is demonstrated for the immune system as it regulates proliferation, differentiation, maturation and functioning of leukocytes and lymphocytes. Zinc plays a signaling role in the modulation of inflammatory responses and is also a factor of nutritional immunity. Alteration of zinc status can significantly affect the immune response resulting in increased susceptibility to inflammatory and infectious diseases such as malaria, tuberculosis, pneumonia and acquired immune deficiency syndrome (AIDS). Previous data had demonstrated that zinc status is associated with the incidence of respiratory tract infections in children and adults. Infants, especially preterm ones, and elderly, are considered to be at high risk of deficiency of zinc and its adverse effects.

Improved antiviral immunity by zinc occurs through up-regulation of interferon-α production and by increasing its antiviral activity. Zinc possesses anti-inflammatory activity by preventing NF-κB signaling and modulating the regulatory T-cell functions, which can limit the cytokine storm in COVID-19. Improved zinc status might reduce the risk of bacterial co-infection by improving the mucociliary clearance and barrier function of the respiratory epithelium. It also has direct antibacterial effects against *Streptococcus pneumoniae*. Zinc status is also associated with risk factors for severe COVID-19 such as aging, immune deficiency, diabetes, obesity and atherosclerosis, as these are considered as high risk groups for zinc deficiency.

Thus, zinc might possess protective effects and can be considered as preventive and adjuvant therapy of COVID-19 through reducing inflammation, improving mucociliary clearance, preventing ventilator-induced lung injury and modulation of antiviral and antibacterial immunity.

Source: Skalny AV, Rink L, Ajsuvakova OP, et al. Int J Mol Med. 2020;46(1):17-26.

COVID-19 Vaccine may be Only Partially Effective, Warns Fauci

A vaccine that is approved for coronavirus could end up being effective only 50-60% of the time. This means that public health measures will still be necessary to control the pandemic, stated Dr Anthony Fauci, top US infectious diseases expert.

He stated that it is still not known what the vaccine efficacy might be. He added that he would want it to be 75% or more. However, the odds of a vaccine being 98% effective are not too good. Therefore, public health approach is still going to be needed to fight the pandemic. According to Fauci, studies of Moderna Inc's COVID-19 vaccine could yield definitive data in November or December this year… (*Reuters*)

■■■■

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

Soul does not Leave the Body Immediately After the Death

KK AGGARWAL

According to Prashna Upanishad, at the time of death, the Prana Vayu (life force and respiration) merges with Udana Vayu (brainstem reflexes) and leaves the body. But this does not happen immediately after clinical death, which is defined as stoppage of heart and respiration. Medically, the term used for clinically dead patients is sudden cardiac arrest.

As per modern medicine, in cardiac arrest, the brain does not die for the next 0 minutes and during this period, if the heart can be revived, life can be brought back.

The revival of patient during this period can be remembered by the F ormula of 0 : Within 0 minutes of the stoppage of heart (cardiac arrest), if effective chest compressions are given for the next 0 minutes with a speed of 0 per minute (0 × 0 , 8% of the cardiac arrest victims can be revived.

This period can be much longer in hypothermia state. If the temperature of the body is low, the soul does not leave the body till the temperature is brought back to normal. Today, this property of soul is also used as therapeutic measure where patients who cannot be revived in the first 10 minutes of clinical death are put in a freezing chamber and artificial hypothermia is produced and these patients can then be transported to an advance cardiac center where even after 24 hours, resuscitation measures can be applied after re-warming the body. Many people have been revived even after 24 hours of cardiac arrest with such a technology.

There are instances in literature where a newborn with hypothermia was declared dead but revived in the cremation ground when the environment heat brought the body temperature to normal and the pressure of the wood worked like cardiac massage.

This aspect of I' ife after death" is a contribution of the modern science to the Vedic science. Though in Vedic literature, it was a well-known phenomenon as Savitri brought life back into Satyavan even after his clinical death.

Take home message is that one should not declare a patient dead in the first 10 minutes; give cardiac massage and try reviving him with chest compression cardiopulmonary resuscitation (CPR).

(Disclaimer: The views expressed in this write up are my own.)

Group Editor-in-Chief, IJCP Group

■■■■

Alcohol Consumption and the Incidence of Hepatocellular Carcinoma in Patients with Hepatitis B Cirrhosis

Liver cirrhosis and hepatocellular carcinoma (HCC) are commonly encountered diseases in developing countries.

Guan et al enrolled 1,095 decompensated hepatic cirrhotic patients admitted to a hospital from September 2014 to August 2 in this study. The components of cirrhotic etiology were described and the impact of alcohol consumption on the incidence of HCC in patients with hepatitis B cirrhosis and hepatitis C cirrhosis was assessed.

The constituent ratios of hepatitis B cirrhosis and alcohol cirrhosis were 31.32% and 30.32%, respectively among the enrolled cirrhotic patients. The incidence of HCC was found to be higher in patients with hepatitis cirrhosis compared to those with alcoholic cirrhosis (24.2% in hepatitis B, 17.5% in hepatitis C and 3.92% in alcoholic). Additionally, HCC incidence in patients with concomitant hepatitis B virus (HBV) and alcohol consumption was found to be higher than that in patients with HBV alone (33.70% vs. 20.72%). To conclude, alcohol consumption tends to heighten the incidence of HCC in patients with hepatitis B cirrhosis but not in patients with hepatitis C cirrhosis.

Source: Guan X, Xing F, Li Y. Eur J Gastroenterol Hepatol. 2020;10.1097/MEG.0000000000001837.

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

Life is All About Choices

Michael is the kind of guy you love to hate. He is always in a good mood and always has something positive to say. When someone would ask him how he was doing, he would reply, "If I were any better, I would be twins!"

He was a natural motivator. If an employee was having a bad day, Michael was there telling the employee how to look on the positive side of the situation. Seeing this style really made me curious, so one day I went up to Michael and asked him, "I don't get it! You can't be a positive person all of the time. How do you do it?"

Michael replied, "Each morning I wake up and say to myself, you have two choices today. You can choose to be in a good mood or … you can choose to be in a bad mood. I choose to be in a good mood." Each time something bad happens, I can choose to be a victim or… I can choose to learn from it. I choose to learn from it.

Every time someone comes to me complaining, I can choose to accept their complaining or… I can point out the positive side of life. I choose the positive side of life. "Yeah, right, it's not that easy," I protested.

"Yes, it is," Michael said. "Life is all about choices. When you cut away all the junk, every situation is a choice. You choose how you react to situations. You choose how people affect your mood. You choose to be in a good mood or bad mood. The bottom line: It's your choice how you live your life."

I reflected on what Michael said. Soon hereafter, I left the Tower Industry to start my own business. We lost touch, but I often thought about him when I made a choice about life instead of reacting to it.

Several years later, I heard that Michael was involved in a serious accident, falling some 60 feet from a communications tower. After 18 hours of surgery and weeks of intensive care, Michael was released from the hospital with rods placed in his back.

I saw Michael about 6 months after the accident. When I asked him how he was, he replied, "If I were any better, I'd be twins. Want to see my scars?" I declined to see his wounds, but I did ask him what had gone through his mind as the accident took place. "The first thing that went through my mind was the well-being of my soon-to-be born daughter," Michael replied.

"Then, as I lay on the ground, I remembered that I had two choices: I could choose to live or… I could choose to die. I chose to live."

"Weren't you scared? Did you lose consciousness?" I asked.

Michael continued, "… the paramedics were great. They kept telling me I was going to be fine. But when they wheeled me into the ER and I saw the expressions on the faces of the doctors and nurses, I got really scared. In their eyes, I read 'he's a dead man'. I knew I needed to take action."

"What did you do?" I asked. "Well, there was a big burly nurse shouting questions at me," said Michael. "She asked if I was allergic to anything. 'Yes, I replied'. The doctors and nurses stopped working as they waited for my reply. I took a deep breath and yelled, 'Gravity'." Over their laughter, I told them, "I am choosing to live. Operate on me as if I am alive, not dead!"

Moral of the story: Michael lived, thanks to the skill of his doctors, but also because of his amazing attitude. I learned from him that every day we have the choice to live fully. Attitude, after all, is everything. After all, today is the tomorrow you worried about yesterday.

Life is about the little choices we make every day!

(Source: Broken Seed, Broken Child By Shiloh).

■■■■

IJCP
A Medical Communications Group

Subscription Form

Jan-Dec 2020

Subscribe to **All Journals** ₹ 10,500/-

SAVE ₹ 500/-

Special Discount on Institutional Packages

Yes, I am interested in subscribing to the *Institutional Combo package for one year (Institutional) ☐

Yes, I am interested in subscribing to the following journal(s) for one year (Institutional) ☐ (individual) ☐

JOURNALS	ISSUES	INSTITUTIONAL (₹ Amount)	INDIVIDUAL (₹ Amount)
Indian Journal of Clinical Practice	12	5,000/- ☐	1,650/- ☐
Asian Journal of Clinical Cardiology	4	1,500/- ☐	550/- ☐
Asian Journal of Diabetology	4	1,500/- ☐	550/- ☐
Asian Journal of Obs & Gynae Practice	4	1,500/- ☐	550/- ☐
Asian Journal of Paediatric Practice	4	1,500/- ☐	550/- ☐

Payment Information

Name: .....

Speciality: .....

Address: .....

.....

Country: ..... State: .....

Pincode: .....

Telephone: ..... Mobile: .....

E-mail: .....

Total ₹11,000/- for 1 year

Pay Amount: .....

Dated (dd/mm/yyyy): .....

Cheque or DD No.: .....

Drawn on Bank: .....

Cheques/DD should be drawn in favor of "M/s IJCP Publications Ltd."

IJCP
A Medical Communications Group

Mail this coupon to (HO):

IJCP Publications Ltd.

Head office: E - 219, Greater Kailash Part - 1, New Delhi - 110 048

Telefax: 40587513 Mob.: 9891272006 E-mail: subscribe@ijcp.com

Website: www.ijcpgroup.com

We accept payments by Cheque/DD only, Payable at New Delhi. Do not pay Cash.

Online subscription: http://subscription.ijcpgroup.com/Default.aspx

Indian Journal of Clinical Practice, Vol. 31, No. 3, August 2020

Lighter Side of Medicine

HUMOR

TROUBLE ON THE ROOF

Mike and Rob were laying tile on a roof when a sudden gust of wind came and knocked down their ladder.

"I have an idea," said Mike. "We'll throw you down, and then you can pick up the ladder."

"What, do you think I'm stupid?" Rob replied. "I have an idea. I'll shine my flashlight, and you can climb down on the beam of light."

"What, do you think I'm stupid?" Mike answers. "You'll just turn off the flashlight when I'm halfway there."

CAB DRIVERS

Two cab drivers met. "Hey," asked one, "why did you paint one side of your cab red and the other side blue?"

"Well," the other responded, "when I get into an accident, you should see how all the witnesses contradict each other.

A LEAVE LETTER TO THE HEADMASTER

"As I am studying in this school I am suffering from headache. I request you to leave me today."

NEVER BE RUDE TO ANYONE

An American tourist asked a boat guy in Zanzibar, "Do you know Biology, Psychology, Geography, Geology or Criminology?"

The boat guy said, "No. I don't know any of these."

The tourist then said, "What at the hell do you know on the face of this Earth? You will die of illiteracy!"

The boat guy said nothing. After a while the boat developed a fault and started sinking. The boatman then asked the tourist, "Do you know Swimology and Escapology from Crocodiology?"

The tourist said, "No!"

The boat guy replied, "Well, today you will Drownology and Crocodiology will eat you. I will not Helpology and you will Dieology because of your Badmouthology."

WHEN I ANSWER THE TELEPHONE

A Psychiatrist was testing the mental status of a patient.

"Do you ever hear voices without being able to tell who is speaking or where the voices are coming from?" asked the psychiatrist.

"As a matter of fact, I do," said the patient.

"And when does this happen?" asked the psychiatrist.

"Oh," said the patient, "when I answer the telephone."

THREE PROFESSIONALS

A Mechanical, Electrical and Computer Engineer were riding together to an Engineering Seminar; the car began jerking and shuttering.

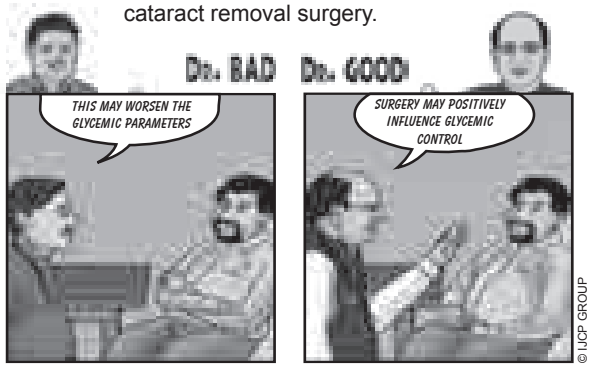
The mechanical engineer said, "I think the car has a faulty carburetor."

The electrical engineer said, "No, I think the problem lies with the alternator."

The computer engineer brightened up and said, "I know, let's stop the car, all get out of the car and get back in again!"

Dr. Good and Dr. Bad

SITUATION: A 39-year-old male with type 2 diabetes but with no maculopathy was scheduled for cataract removal surgery.



LESSON: According to a prospective longitudinal study, cataract removal surgery may positively influence glycemic control and thus quality-of-life in patients with type 2 diabetes without maculopathy. Results in terms of visual and glycemic terms are likely to be better in younger patients.

Curr Eye Res. 2018;43(1):96-101.

IJCP SUTRA: *"Remain upright after meals."*

Indian JOURNAL of CLINICAL PRACTICE

Indian Citation Index (ICI),

IndMed (http://indmed.nic.in/)

MedIND (http://medind.nic.in/)

University Grants Commission (20737/15554).

ISSN number 0971-0876

RNI number 50798/1990.

The Medical Council of India (UGC, ICI)

Indian Journal of Clinical Practice is published by the IJCP Group. A multispecialty journal, it provides clinicians with evidence-based updated information about a diverse range of common medical topics, including those frequently encountered by the Indian physician to make informed clinical decisions. The journal has been published regularly every month since it was first launched in June 1990 as a monthly medical journal. It now has a circulation of more than 3 lakh doctors.

IJCP is a peer-reviewed journal that publishes original research, reviews, case reports, expert viewpoints, clinical practice changing guidelines, Medilaw, Medifinance, Lighter side of medicine and latest news and updates in medicine. The journal is available online (http://ebook.ijcpgroup.com/Indian-Journal-of-Clinical-Practice-January-2018.aspx) and also in print. IJCP can now also be accessed on a mobile phone via App on Play Store (android phones) and App Store (iphone). Sign up after you download the IJCP App and browse through the journal.

IJCP is indexed with Indian Citation Index (ICI), **IndMed** (http://indmed.nic.in/) and is also listed with MedIND (http://medind.nic.in/), the online database of Indian biomedical journals. The journal is recognized by the University Grants Commission (20737/15554). The Medical Council of India (MCI) approves journals recognized by UGC and ICI. Our content is often quoted by newspapers.

The journal ISSN number is 0971-0876 and the **RNI number** is 50798/1990.

If you have any **Views, Breaking news/article/research or a rare and interesting case report that you would like to share with more than 3 lakh doctors send us your article for publication in IJCP at editorial@ijcp.com.**

Dr KK Aggarwal
Padma Shri Awardee
Group Editor-in-Chief, IJCP Group

Indian JOURNAL CLINICAL PRACTICE

Information for Authors

Manuscripts should be prepared in accordance with the 'Uniform requirements for manuscripts submitted to biomedical journals' compiled by the International Committee of Medical Journal Editors (Ann. Intern. Med. 1992;96: 766-767).

Indian Journal of Clinical Practice strongly disapproves of the submission of the same articles simultaneously to different journals for consideration as well as duplicate publication and will decline to accept fresh manuscripts submitted by authors who have done so.

The boxed checklist will help authors in preparing their manuscript according to our requirements. Improperly prepared manuscripts may be returned to the author without review. The checklist should accompany each manuscript.

Authors may provide on the checklist, the names and addresses of experts from Asia and from other parts of the World who, in the authors' opinion, are best qualified to review the paper.

Covering letter

- The covering letter should explain if there is any deviation from the standard IMRAD format (Introduction, Methods, Results and Discussion) and should outline the importance of the paper.
- Principal/Senior author must sign the covering letter indicating full responsibility for the paper submitted, preferably with signatures of all the authors.
- Articles must be accompanied by a declaration by all authors stating that the article has not been published in any other Journal/Book. Authors should mentioned complete designation and departments, etc. on the manuscript.

Manuscript

- Three complete sets of the manuscript should be submitted and preferably with a CD; typed double spaced throughout (including references, tables and legends to figures).
- The manuscript should be arranged as follow: Covering letter, Checklist, Title page, Abstract, Keywords (for indexing, if required), Introduction, Methods, Results, Discussion, References, Tables, Legends to Figures and Figures.
- All pages should be numbered consecutively beginning with the title page.

Note: Please keep a copy of your manuscript as we are not responsible for its loss in the mail. Manuscripts will not be returned to authors.

Title page

Should contain the title, short title, names of all the authors (without degrees or diplomas), names and full location of the departments and institutions where the work was performed, name of the corresponding authors, acknowledgment of financial support and abbreviations used.

- The title should be of no more than 80 characters and should represent the major theme of the manuscript. A subtitle can be added if necessary.
- A short title of not more than 50 characters (including inter-word spaces) for use as a running head should be included.
- The name, telephone and fax numbers, e-mail and postal addresses of the author to whom communications are to be sent should be typed in the lower right corner of the title page.
- A list of abbreviations used in the paper should be included. In general, the use of abbreviations is discouraged unless they are essential for improving the readability of the text.

Summary

- The summary of not more than 200 words. It must convey the essential features of the paper.
- It should not contain abbreviations, footnotes or references.

Introduction

- The introduction should state why the study was carried out and what were its specific aims/objectives.

Methods

- These should be described in sufficient detail to permit evaluation and duplication of the work by others.
- Ethical guidelines followed by the investigations should be described.

Statistics

The following information should be given:

- The statistical universe i.e., the population from which the sample for the study is selected.
- Method of selecting the sample (cases, subjects, etc. from the statistical universe).
- Method of allocating the subjects into different groups.
- Statistical methods used for presentation and analysis of data i.e., in terms of mean and standard deviation values or percentages and statistical tests such as Student's 't' test, Chi-square test and analysis of variance or non-parametric tests and multivariate techniques.
- Confidence intervals for the measurements should be provided wherever appropriate.

Results

- These should be concise and include only the tables and figures necessary to enhance the understanding of the text.

Discussion

– This should consist of a review of the literature and relate the major findings of the article to other publications on the subject. The particular relevance of the results to healthcare in India should be stressed, e.g., practicality and cost.

References

These should conform to the Vancouver style. References should be numbered in the order in which they appear in the texts and these numbers should be inserted above the lines on each occasion the author is cited (Sinha[12] confirmed other reports[13,14]...). References cited only in tables or in legends to figures should be numbered in the text of the particular table or illustration. Include among the references papers accepted but not yet published; designate the journal and add 'in press' (in parentheses). Information from manuscripts submitted but not yet accepted should be cited in the text as 'unpublished observations' (in parentheses). At the end of the article the full list of references should include the names of all authors if there are fewer than seven or if there are more, the first six followed by et al., the full title of the journal article or book chapters; the title of journals abbreviated according to the style of the Index Medicus and the first and final page numbers of the article or chapter. The authors should check that the references are accurate. If they are not this may result in the rejection of an otherwise adequate contribution.
Examples of common forms of references are:

Articles

Paintal AS. Impulses in vagal afferent fibres from specific pulmonary deflation receptors. The response of those receptors to phenylguanide, potato S-hydroxytryptamine and their role in respiratory and cardiovascular reflexes. Q. J. Expt. Physiol. 1955;40:89-111.

Books

Stansfield AG. Lymph Node Biopsy Interpretation Churchill Livingstone, New York 1985.

Articles in Books

Strong MS. Recurrent respiratory papillomatosis. In: Scott Brown's Otolaryngology. Paediatric Otolaryngology Evans JNG (Ed.), Butterworths, London 1987;6:466-470.

Tables

– These should be typed double spaced on separate sheets with the table number (in Roman Arabic numerals) and title above the table and explanatory notes below the table.

Legends

– These should be typed double spaces on a separate sheet and figure numbers (in Arabic numerals) corresponding with the order in which the figures are presented in the text.

– The legend must include enough information to permit interpretation of the figure without reference to the text.

Figures

– Two complete sets of glossy prints of high quality should be submitted. The labelling must be clear and neat.

– All photomicrographs should indicate the magnification of the print.

– Special features should be indicated by arrows or letters which contrast with the background.

– The back of each illustration should bear the first author's last name, figure number and an arrow indicating the top. This should be written lightly in pencil only. Please do not use a hard pencil, ball point or felt pen.

– Color illustrations will be accepted if they make a contribution to the understanding of the article.

– Do not use clips/staples on photographs and artwork.

– Illustrations must be drawn neatly by an artist and photographs must be sent on glossy paper. No captions should be written directly on the photographs or illustration. Legends to all photographs and illustrations should be typed on a separate sheet of paper. All illustrations and figures must be referred to in the text and abbreviated as "Fig.".

Please complete the following checklist and attach to the manuscript:

1. Classification (e.g. original article, review, selected summary, etc.)_____
2. Total number of pages _____
3. Number of tables _____
4. Number of figures _____
5. Special requests _____
6. Suggestions for reviewers (name and postal address)

Indian	Foreign
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____

7. All authors' signatures_____
8. Corresponding author's name, current postal and e-mail address and telephone and fax numbers _____

Online Submission
Also e-Issue @ www.ijcpgroup.com

For Editorial Correspondence
Dr KK Aggarwal
Group Editor-in-Chief
Indian Journal of Clinical Practice
E-219, Greater Kailash Part-1
New Delhi - 110 048. Tel: 40587513
E-mail: editorial@ijcp.com Website: www.ijcpgroup.com

Talking Point Communications

-A Unit of the IJCP Group of Medical Communications

IJCP
A Medical Communication Group

Brand
Launches

Start-Up
Profiling

Celebrity
Coordination

Conferences
Events

New product
& Service Launches

Media
Outreach

CEO/Leadership
Profiling

Digital
Marketing

Reputation
Management

APHRS · Dr. Reddy's · translumina therapeutics · IIC SUMMIT 2014

For More Information call: 9582363695, E-mail naina.a@talkingpointcommunications.com
Website: http://talkingpointcommunications.com

Quista® DN

Researched Nutritional Supplement for Diabetics

- **Provides 26 g of good quality proteins* per day** – Meets 43% of the Recommended Dietary Allowance (RDA)#
- **Low GI with sustained energy release** – Contains low GI carbohydrates, slow (casein) and medium digesting (pea) proteins, and soluble and insoluble fiber which help optimize glycemic response
- **Fortified with powerful ACCTI♦ nutrients** – For beneficial effects in diabetics
- **Fortified with key nutrients** including B complex vitamins, chromium, and zinc – Help in modulating glucose metabolism
- Free from trans fatty acids
- No added sucrose

*Twice daily in 200 mL of toned milk. #Nutrient Requirement and RDA for Indians. ICMR 2010.
♦Alpha-Lipoic acid, Coenzyme Q10, L-Carnitine, Taurine, and Inositol

Indications

Prediabetes and diabetes.

Directions for use:

2 scoops (approx. 25 g) of Quista DN powder to be added into 200 mL of lukewarm/chilled toned milk or water and stirred briskly until well mixed.

Recommended servings:

Twice daily in between meals or at bedtime, or as directed by your healthcare professional. One serving of Quista DN in 200 mL of toned milk provides 212 kcal.

Delicious

Milk Masala and Vanilla Flavors

FOOD FOR SPECIAL DIETARY USE – For diabetic and prediabetic individuals.
NOT FOR MEDICINAL USE
Store this pack out of reach of children. Not for parenteral use.
Contains milk and soy ingredients. Manufactured in a facility handling nuts and soy ingredients. Not for individuals with lactose intolerance.
To be used under the advice of a healthcare professional as part of diabetes management regimen for adults, which includes physical activity and diet.

The Himalaya Drug Company
Makali, Bengaluru 562 162, India
www.himalayawellness.com
E-mail: write.to.us@himalayawellness.com

R.N.I. No. 50798/1990
Date of Publication 13th of Same Month
Date of Posting 13-14 Same Month

POSTAL REGISTRATION NO. DL (S)-01/3200/2018-2020
Posted in N.D. PSO New Delhi