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Dr KK Aggarwal

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Dr KK Aggarwal
President, CMAAO and HCFI
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Avian Botulism Killed 18,000 Migratory Birds in Rajasthan in November, 2019

Like Humans the Birds also have their Rights

Carcasses of over 18,000 migratory birds were buried in 10 days in November, 2019 after they were found at India's largest inland saltwater lake, about 80 km southwest of Jaipur city.

Investigations so far suggest avian botulism, a paralytic and frequently fatal disease, caused by the ingestion of toxins.

Sambhar Lake is India's largest inland saltwater lake and has a catchment area of 5,700 sq km, with the water depth fluctuating between 60 cm in the dry season to about 3 meters at the end of the monsoon. Every year, the lake attracts thousands of migratory birds. A total of 83 species of water birds have been recorded at the lake, the most abundant of which are little grebe, great crested grebe, great white pelican, little cormorant, black stork, and darter, apart from various species of plovers, egrets, herons and geese. Birds of about 25-30 species have now been found dead, including northern shoveler, Brahminy duck, pied avocet, Kentish plover and tufted duck.

November 10: Visitors found large number of dead birds.

November 20: Rajasthan government buried 18,422 bird carcasses to prevent the spread of infection. Of these, 8,825 were disposed of in Jaipur and 9,597 in Nagaur. Officials also rescued 748 birds.

On the basis of history, epidemiological observations, classical clinical symptoms and post-mortem findings, the most probable diagnosis is avian botulism as per Apex Centre for Animal Disease Investigation, Monitoring and Surveillance at the College of Veterinary and Animal Science under the Rajasthan University of Veterinary and Animal Sciences (RAJUVAS), Bikaner.

The clinical signs exhibited by affected birds included dullness, depression, anorexia, flaccid paralysis in legs and wings, and neck touching the ground. The birds were unable to walk, swim or take flight. There was no rise of body temperature, no nasal discharge, no respiratory distress or any other sign.

Humans are primarily at risk from avian botulism only if they eat infected fish or birds.

There have been several waterfowl botulism outbreaks. Between 1995 and 1997 in Canada, an estimated 1,00,000 birds died in Alberta, 1,17,000 in Manitoba, and 1 million in Saskatchewan. In 1997, another 5,14,000 birds died due to botulism in Green Salt Lake, Utah, US. In 1952, an epizootic outbreak killed 4-5 million waterfowl across western US.

Division Bench of the Rajasthan High Court took cognizance of the deaths. The Rajasthan government listed likely reasons:

- Viral infection
- Toxicity, as a new area has been filled up after almost 20 years, and there could be higher concentration of salts along the edges
- Bacteriological infection
- Higher temperature and high-water levels due to a good monsoon. This might have led to an increase in competition for resources. The weaker individuals, exhausted from the long journey, perhaps were unable to compete, and may have succumbed to stress emanating from the shortage of food, susceptibility to disease/pollutants/toxins and other habitat-related factors in the wintering grounds. If that is the reason, it is expected that with fall of temperature and lowering of water levels, incidence of such mortality will go down.

ABOUT AVIAN BOTULINUM

Eight distinct *Clostridium botulinum* toxin types have been described: A through history of these eight, types A, B, E, and rarely F, G and H, cause human disease, whereas C and D cause disease in animals such as cattle, ducks and chickens.

They are ubiquitous and are easily isolated from the surfaces of vegetables, fruits and seafood, and exist in soil and marine sediment worldwide.

Avian botulism can occur in any bird species, but is most frequently seen in ducks, geese, swans, ibis, egrets and pelicans. It occurs worldwide and is commonly reported in wild birds in Australia. Most birds that develop botulism will die if not treated. Toxin production by *C. botulinum* only occurs under specific environmental conditions. Most outbreaks of botulism occur in the summer and autumn and often occur repeatedly in the same environment.

The main treatment for avian botulism:

- Supportive care
- Recovery takes several weeks, and fluid therapy and supplemental feeding is generally required
- Botulinum antitoxin may be used
- Artificial water bodies should be designed so that enough aeration and water circulation are provided
- Steep sides and deeper water may also keep water temperatures stable and prevent botulinum production from occurring
- It is also very important to prevent or limit the organic inputs entering both natural and artificial water bodies, as this reduces the energy resources available for the bacterium to grow
- By reducing carcass numbers and thus maggot load, mortality may be reduced
- Dispersal of birds has also been used to reduce mortality
- In Australia, outbreaks do not occur in breeding flocks and so efforts to move birds off the water body that is the cause of the outbreak may be an effective way of reducing mortality
- In Australia, Botulism is listed by the OIE (World Organization for Animal Health) as a reportable disease in wildlife.

Immediate and effective steps are required for treatment of avian botulism.

■■■■

WHO Commemorates the 40th Anniversary of Smallpox Eradication

The WHO commemorated the 40th anniversary of smallpox eradication, recognizing the historic moment on December 9, 1979 when smallpox was confirmed to have been eradicated. Five months later, in May 1980, the 33rd World Health Assembly issued its official declaration that "the world and all its people have won freedom from smallpox."

Speaking at the event attended by country representatives, UN representatives and WHO staff who worked on smallpox, WHO Director-General Tedros Adhanom Ghebreyesus said, "Today, smallpox is the only human disease ever eradicated, a testimony to what we can achieve when all nations work together." (*WHO*)

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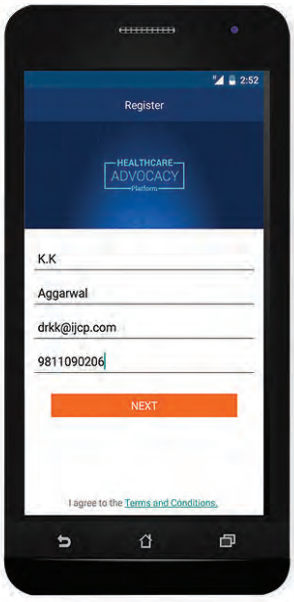

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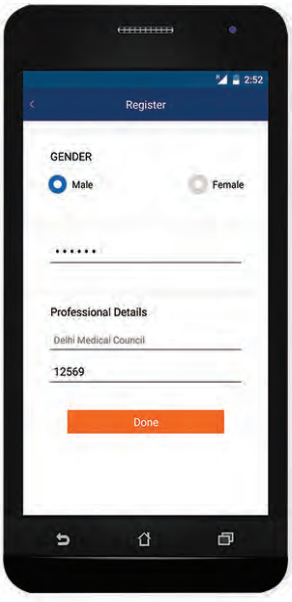

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Indian Journal of Clinical Practice, Vol. 30, No. 8, January 2020

NATCON 2019: Reconnect, Rejuvenate and Resolve

Dr Rajan Sharma
MS (Ortho)
National President
Indian Medical Association

Honorable Chief Guest, Immediate Past President Dr Santanu Sen, respected Elders, my colleagues and friends, it's my privilege to stand before you as the National President of Indian Medical Association (IMA). My special thanks to our leader Dr Ketan Desai for giving me this opportunity to serve the Association. With a deep sense of humility, I thank you all for reposing your confidence in me to lead the medical fraternity of India. I hope I will be able to meet your expectations in carrying out the responsibilities bestowed upon me with your kind support and cooperation.

I would like to reiterate and stand by the original resolution of IMA passed 91 years ago on this day which says – *IMA is formed with the objective of looking after the interest of Medical Education, Public Health and Medical Profession in India.*

Whereas, I will be taking forward all the good work done by my predecessors to the logical conclusion, the following important activities will be taken up on priorities:

VIOLENCE AGAINST DOCTORS, HEALTH CARE WORKERS AND CLINICAL ESTABLISHMENTS

IMA is viewing with lot of concern on the increasing violence against doctors, health workers and clinical establishments. Many a times, it is lack of basic facilities in the government hospitals which trigger such episodes and junior doctors become a victim of this dissatisfaction of the patients to lack of common facilities. It is distressing to note that intellectuals, professionals, public, police or judiciary are reluctant to criticize on such uncivilized and heinous crime. Even in a war zone hospitals are a protected zone. When a hospital is attacked not only the concerned health worker is attacked but the whole patients in the hospital are psychologically and physically affected and the care of these patients are also affected. About 19 states in our country have Hospital Protection Act, but their effective implementation is affected due to a lack of specific rules in the police manual and specific section in CrPC which can only be done by Central act. IMA demands that a Central act should be enacted at the earliest. IMA also demands that hospitals are declared as protected zone. IMA also declares hospitals as **Zero Tolerance Zone**.

HEALTH POLICY OF THE GOVERNMENT OF INDIA AND NATIONAL MEDICAL COMMISSION ACT

The Government of India has made an undeclared serious deviation in the health policy of our country. IMA is very much distressed that these fundamental changes will lower the standard of medical education and affect patient safety and health delivery. Way back in 1946, Sir John Bhore Committee recommended that MBBS should be the minimum qualification to practice and prescribe modern medicine.

The committee also recommended a three-tier health delivery system. In 1956, these fundamental principles were incorporated in the Medical Council of India Act. Unfortunately, through section 32, 50 and 51 of National Medical Commission (NMC) Act, Government is implementing middle level practitioners and AYUSH doctors with bridge courses to practice modern medicine at sub center, and PSC level. These middle level practitioners will also be allowed to practice even at higher level hospitals. That means primary health care which forms 60% of health needs of public will be taken care of by these unqualified and improperly trained persons. This will in effect discriminate the rural public and deny them the fundamental right for health. IMA is deeply concerned about the patient safety if this is going to be implemented. The standard of medical education will also be affected if various sections of the NMC Act regarding medical education are implemented.

94th National Annual Conference and
80th Annual Meeting of Central Council
Indian Medical Association

Current projected increments in healthcare GDP is much below requirement. IMA appeals to the Govt. to increase healthcare GDP without further delay. IMA also appeals for tax subsidy for healthcare providers and professionals. A special healthcare zone for private small and medium size hospitals needs to be created like Special Economic Zone.

NATIONAL EDUCATION POLICY

National Education Policy (NEP) vis-a-vis medical education is also a matter of concern to IMA. By introducing common syllabi and curriculum for three years for all streams of medical systems and providing provision for lateral entry, is going to promote unscientific mixing of various systems of medicines. Under the excuse of outdated syllabi, institutional powers to decide/change their own syllabi will harm the quality. Teaching medical students, the basic principles of various systems of medicines which are different and contradictory will help only in confusing them. NEP overlooks the natural, rational and visionary sides of education policy needs. The requisites in the NEP are replaced by many unwarranted, harmful inclusions.

ALLIED AND HEALTHCARE PROFESSIONALS BILL

IMA welcomes formation of Paramedical Council/Allied Health Professionals Council to regulate standards of education of paramedical courses and for maintenance of registry for qualified paramedical personnel. But IMA is definitely against allowing paramedical personnel like physiotherapist, occupational therapists, optometrists, clinical psychologist, speech therapists, etc. being given independent authority to practice their own area without doctor's supervision.

PROPOSED AMENDMENT TO SCHEDULE K OF DRUGS AND COSMETIC ACT

The Health Ministry is amending schedule K of Drugs and Cosmetic Act to allow various categories of health care workers and middle level practitioners to prescribe modern medicine without supervision. The Drugs and Cosmetic Act permit as of now only pharmacists and single man clinic doctors to dispense medicine. Allowing various categories of health care workers and middle level practitioners who are not qualified enough to prescribe and dispense modern medicine without supervision will greatly affect the patient safety. IMA demands that such amendments of schedule K of Drugs and Cosmetic Act should be withdrawn.

AYUSHMAN BHARAT

IMA welcomes the concept of free health care particularly to the people below the poverty line. Although the objective is laudable, the means to attain the goal through health insurance is not a practicable one. The health insurance model is a failed model even in countries like USA. Ayushman Bharat scheme doesn't cover OP treatment. Under the Ayushman Bharat scheme there is provision for private health insurance agency as an intermediary and their service charge is 15% of total budget, even in USA the private health insurance agency is paid 5% of the total budget. One is left to wonder whether the scheme is meant to support the private agency or public health. It is irrational to include Government health institutions under the scheme since Government clinical establishments can be directly funded rather than after paying private insurance agencies for service charges.

The package rates for procedures are very low and financially unsustainable to private medical institutions. IMA demands that Government clinical establishment should be excluded from this program and should be funded directly for completely free treatment, the package rates should be revised to make it financially viable to the private medical sector.

FORMATION OF NATIONAL MEDICAL CADRE

IMA supports the concept of Indian Medical Services at par with others all India services and have uniform medical cadre across the country.

ACADEMIC WINGS OF IMA

IMA has College of General Practitioners, Academy of Medical Specialists and AKN Sinha Institute of Medical Sciences as academic wings. There is considerable overlap in the courses conducted by these wings. None of these courses are recognized by any University, National board of examination or Medical Council of India. An effort will be made to restructure these courses to suit the requirement of the members of various wings. The topics will be decided, the syllabi will be accordingly modified and the duration of the course and fee will be uniform. An attempt will be made to get the courses recognized as post diplomas by appropriate bodies.

INVESTING IN NEXT GEN

Medical Students' Network and Junior Doctors' Wing are very important resourceful strength of our organization. We appreciate the initiative taken by MSN & JDN in

fighting against draconian laws of Govt. and further disseminating the view points of IMA through Awaken India and Suno Bharat program in different medical colleges. IMA would like to work hard to bring the younger generation in the main stream.

HEALTHCARE ACCREDITATION

Quality of Patient Care Services is important, but making a prerequisite of Healthcare Accreditation by insurance agencies will be a huge roadblock for rendering healthcare services in small and mid size towns. In my view, smaller and single doctor clinical setups need to be exempted from the basic requirements of Healthcare Accreditation. As we are aware, we are facing problem in implementing parts of BMW Management Rules such as ETP/STP/ Fire safety, etc. which are being forced upon us with retrospective effect. Even healthcare establishments which are running in the tribal and hilly areas are not spread. This will only increase the establishment cost in providing healthcare services.

AWARENESS, INFORMATION AND COMMUNICATION

We cannot run away from the fact of the current era of effective communications with the patients and relatives which is their right. Always spend time explaining the outcome of the treatment and greet the patient with the smile showing empathy and sympathy. Complications if any should be owned and we should be seen with the patients. The current scenario of increasing of violence which is being propitiated on us has many dimensions. Lack of planning and inadequate budgetary provisions for health by the successive governments has worsened the situation.

The system of CHCs, PHCs, Urban Heatlth Centers and secondary care hospitals was a well thought out plan but, we failed to create required infrastructure - residential accomodations for doctors and staff, diagnostic facilities and basic amenities like water and electricity. In today's scenario the healthcare authorities want everything to be delivered by us through the so-called insurance schemes. The schemes are loss making and ultimately we are the ones to face the brunt as in cases of CGHS, ECHS, Ayushman Bharat and the previous RSBY schemes.

The Theme of this year will be:

"Protect the Single and Couple Doctor Setups"

In conclusion, I want all my brethren and their family members to be healthy and stress free and should take out quality time for the family and find ways and means to be stress-free. Further, I appeal all my fraternity members to remain undisturbed by unwanted rumors spread through social media on activities of IMA and their members. IMA will make all possible efforts to reach out and disseminate the messages through our leaders, CWC members, CC members state branches and local branches.

I sincerely thank Dr Santanu Sen, Immediate Past National President, IMA, Dr R V Asokan, Honorary Secretary General, IMA, Office Bearers of IMA Headquarters, Schemes and Wings and all the Staff of IMA Headquarters for supporting me in last One Year for my active participation as National President (Elect) and I expect the similar cooperation in the ensuing year.

KNOW YOUR PRESIDENT

Dr Rajan Sharma is a renowned Orthopedic Surgeon from Yamunanagar (Haryana). He runs 30 bedded "Rajan Hospital" and also a Nursing College (Dr J P Sharma Memorial College of Nursing) in Yamunanagar.

Academics

- MBBS from Dayanand Medical College and Hospital, Ludhiana
- MS (Ortho) from Dayanand Medical College and Hospital, Ludhiana

Clinical Experience

Senior Resident in PGIMER, Chandigarh

Other Credentials:

- 7 International Publications
- Paul Harris Rotarion
- Rotary Medical Mission Director to Rwanda, Gabon, Cameroon, Zimbabwe, etc.

Dr Rajan Sharma is a member of IMA since 1999 and since then he has served the Association as Member of IMA CWC, President of IMA Jagadhri - Yamunanagar Branch in 2006-07.

He was President of Haryana State Branch for more than two years from 2011 to 2013. During his tenure as President, he was able to revive the state IMA and helped it achieve new heights.

He was a member of IMA-CWC for many years. He was Director of IMA AKN Sinha Institute of Medical Sciences. He was a member of IMA HBI in 2016.

He is the Coordinator of Beti Bachao Programme of North Zone.

Since 1999 onwards, he started taking pro-active initiatives in the working of IMA Haryana State Branch.

He is involved in many social activities apart from medical practice. Due to his active involvement following achievements were possible:

- Haryana is the only state where Exemption from Clinical Establishment Act has been granted to hospitals with less than fifty beds.
- Haryana is one of the few states where a District Medical Negligence Board has been constituted thus ending the terror of Police Complaint and arrest in Negligence cases. Haryana was the third state where an Act for violence against Doctors came into existence. These achievements have come with the ongoing efforts of successive teams but the foundations were laid during his tenure as State President.

Family

Father	:	Late Dr J P Sharma
Mother	:	Smt Krishna Pandit, Former Minister in Govt. of Haryana
Wife	:	Dr Meenakshi Sharma, Obstetrician and Gynecologist
Daughters	:	Ms Tanya, Pursuing Masters in Fashion Design and Ms Riya, Medical Student 2nd Year

To maintain the Honour and Dignity and to uphold the interest of medical profession and to promote cooperation amongst members and fight against the doctor unfriendly policies of the administration are amongst his priorities.

His Baptism in IMA started in his early age when his father Late Dr J P Sharma led the Local IMA, IMA Haryana State (1977-78) and later had organized Medicon 1989 in Yamunanagar. He was also National Vice President-IMA Head Quarters.

■■■■

Scientists Home in on Potential Treatments for Deadly Nipah Virus

Scientists working on how to combat a highly infectious and deadly virus called Nipah, which is transmitted to humans from bats and pigs, say they have found around a dozen potential drugs that might be developed to block the disease.

"This is a potentially very serious health hazard, because so far, every single time it has struck, the fatality rates have been extremely high," said MS Madhusudhan, an associate professor at the Indian Institute of Science Education and Research who co-led the research. Madhusudhan and colleagues screened potential molecules against various strains of the Nipah virus and found around 150 possibles. Of those, Madhusudhan said, "there are around a dozen in which we have somewhat higher confidence" as potential future drugs. The findings were published in *PLOS Neglected Tropical Diseases* journal… (*Reuters*)

FDA Okays First Newborn Screening Test for Duchenne MD

The US FDA has authorized the marketing of the first newborn screening test for Duchenne muscular dystrophy (DMD), the agency announced.

The GSP Neonatal Creatine Kinase-MM kit (PerkinElmer) measures levels of creatine kinase (CK) from dried blood samples collected from a draw from an infant's heel 24-48 hours after birth. Although high levels may indicate the presence of DMD, the FDA notes that the findings would still need to be confirmed with other testing methods, such as muscle biopsies or genetic tests… (*Medscape*)

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Post-marketing Surveillance Survey of Hydrolyzed Collagen Type II Combination for the Management of Osteoarthritis

MANOJ KUMAR*, MADHU KANT†

ABSTRACT

Objective: A survey was conducted to evaluate the post-marketing surveillance on complete management of osteoarthritis (OA) using orally administered hydrolyzed collagen type II combination (Collagen type II - 10 gm, sodium hyaluronate - 12.5 mg, 30% 3-O-acetyl-11-keto-beta-boswellic acid (AKBA) - 100 mg, curcuminiods 95% - 125 mg, piperine - 2.5 mg). **Methods:** Three hundred doctors from across India participated in the survey. Each doctor treated patients with OA using the above-mentioned combination. Symptoms were assessed before and after using the collagen combination. The doctors filled a questionnaire which was collected at the end of the survey. Answers to all the questions were then analyzed. **Results:** OA was most commonly seen in people aged over 50 and showed male preponderance. Grade I OA was the most common presentation. Joint pain was the most common symptom of OA, which can usually be present even at rest. Morning stiffness for <30 minutes was common in OA patients. Four weeks of treatment with the combination led to a statistically significant increase in number of patients that were able to drive a car or use public transport; carry out vigorous activities; walk unassisted; perform simple activities like writing, combing hair, reach shelves above head, etc.; sleep at night and indulge in social activities. The treatment also led to statistically significant reduction in frequency of severe pain; statistically significant reduction in frequency of morning stiffness; statistically significant increase in distance covered by patients in 6-minute walk test. **Conclusion:** A combination of collagen type II, sodium hyaluronate, AKBA, curcuminiods and piperine seems to be a potential therapeutic option in OA patients over 50 years of age to relieve their symptoms and improve their quality of life.

Keywords: Osteoarthritis, collagen type II, curcumin, quality of life

Osteoarthritis (OA), a chronic degenerative disorder, is a condition marked by loss of articular cartilage, hypertrophy of bone at margins, subchondral bone changes, besides other biochemical and morphological changes in the synovial membrane and joint capsule. This disorder with a multifactorial etiology involves the interaction of genetic, metabolic, biochemical and biomechanical factors.[1,2]

The classic symptoms of OA include pain, which usually follows prolonged activity and weight-bearing and stiffness, experienced after inactivity. The joints commonly affected are those of the hands, feet, spine and large weight-bearing joints, including the hips and knees.[1]

OA has a prevalence rate of around 22-39% in India, with a female preponderance. The prevalence has been shown to increase considerably with age.[1] Nearly 40% of the population above the age of 70 years shows OA.[3]

The management of OA involves nonpharmacological and pharmacological approaches focusing on disease prevention and curbing progression.[2] Non-pharmacological management involves exercises, both land- and water-based, weight management, strength training, self-management and education. Assistance with mobility, using a stick, knee braces and foot orthoses, can help decrease pain and improve function.[2]

Nonsteroidal anti-inflammatory drugs (NSAIDs) form the first-line of pharmacological management. NSAIDs are effective for overall pain; however, the adverse effects of NSAIDs are well-known. NSAIDs are associated with gastrointestinal (GI) adverse events.

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The risk of developing serious GI complications is 3- to 5-times higher among NSAID users as compared to nonusers.[4] NSAIDs are associated with cardiovascular and renal risks as well.[2] Acetaminophen is usually the analgesic of choice for mild to moderate pain in OA, considering the side effects associated with NSAIDs. However, it has been found to have low-level efficacy in OA.[5] Topical application of NSAIDs and capsaicin has been found to be effective in managing OA symptoms.[2]

Intra-articular corticosteroid injections have been shown to provide short-term pain relief and tend to improve function in OA patients. Patients with acute exacerbations with joint effusions and local inflammation can be given these injections.[2] Opioids can be an alternative therapeutic option for patients who cannot tolerate first-line drugs.[2] However, they are associated with the risk of adverse effects. A comparative study revealed that opioids were associated with an increased relative risk of several safety events in comparison with NSAIDs.[6]

Joint replacement surgery is considered for severe clinical disease when there is inadequate response to conservative treatment.[2]

OBJECTIVE

A survey was conducted to evaluate the post-marketing surveillance on complete management of OA using orally administered hydrolyzed collagen type II combination (Collagen type II - 10 gm, sodium hyaluronate - 12.5 mg, 30% 3-O-acetyl-11-keto-beta-boswellic acid (AKBA) - 100 mg, curcuminiods 95% - 125 mg, piperine - 2.5 mg).

METHODS

A random sample of 300 doctors across India was selected who participated in the survey. In this survey, each doctor enrolled 3 patients with OA and utilized the above-mentioned combination for the management of OA.

Employing user trial experience, a total of 500 patients with OA were enrolled and kept on the aforementioned combination for 4 weeks; however, data could not be gathered for all the enrolled patients. The symptoms were assessed before and after using the collagen combination.

The doctors were given a questionnaire to fill which were collected at the end of the survey. Answers to all the questions were then analyzed. The questionnaire included the following questions:

1. What is the age group in which OA is mostly seen?
2. In your clinical experience, OA is more common in …….
3. What are the most common symptoms in a patient suffering with OA?
4. Does the patient complain of joint pain at rest or at night?
5. Does the patient experience morning stiffness for <30 minutes?
6. Does the patient exhibit any of these on physical examination - limited range of motion (LRM), small effusions (SE), joint line tenderness (JLT)?
7. The patient is suffering from which stage of OA?
8. and 17. Is the patient able to physically drive a car or use public transport? Baseline vs. 4 weeks
9. and 18. Did the patient carry out vigorous activities such as running, lifting heavy objects? Baseline vs. 4 weeks
10. and 19. Was the patient able to walk unassisted?
11. and 20. Can the patient easily perform simple activities like writing with pen/pencil; comb/brush hair; reach shelves above head; dress on own; get out of bed without help?
12. and 21. What was the frequency of severe pain from arthritis?
13. and 22. How often did patient experience morning stiffness for over an hour?
14. and 23. Is the patient able to sleep at night?
15. and 24. How often does the patient indulge in social activities such as get together with friends or relatives; talk on telephone with close friends or relatives; go to a meeting, club, team, party, etc.?
16. and 25. During the 6-minute walk test, what is the distance covered by the patient?

To compare the data of baseline and at the end of 4 weeks, statistical analysis and tests were applied to compare the difference and its significance. The analytical tool used is shown in Figure 1.

RESULTS

The majority of patients with OA were >50 years of age (Fig. 2). According to the survey results, OA was found to be more common among males (69.05%; Fig. 3). The most common symptom in patients with OA was joint pain (72.37% patients), followed by stiffness (27.37% patients) and swelling/inflammation (1 patient - 0.26%) (Fig. 4). About 75.53% patients complained of joint pain at rest. Morning stiffness for

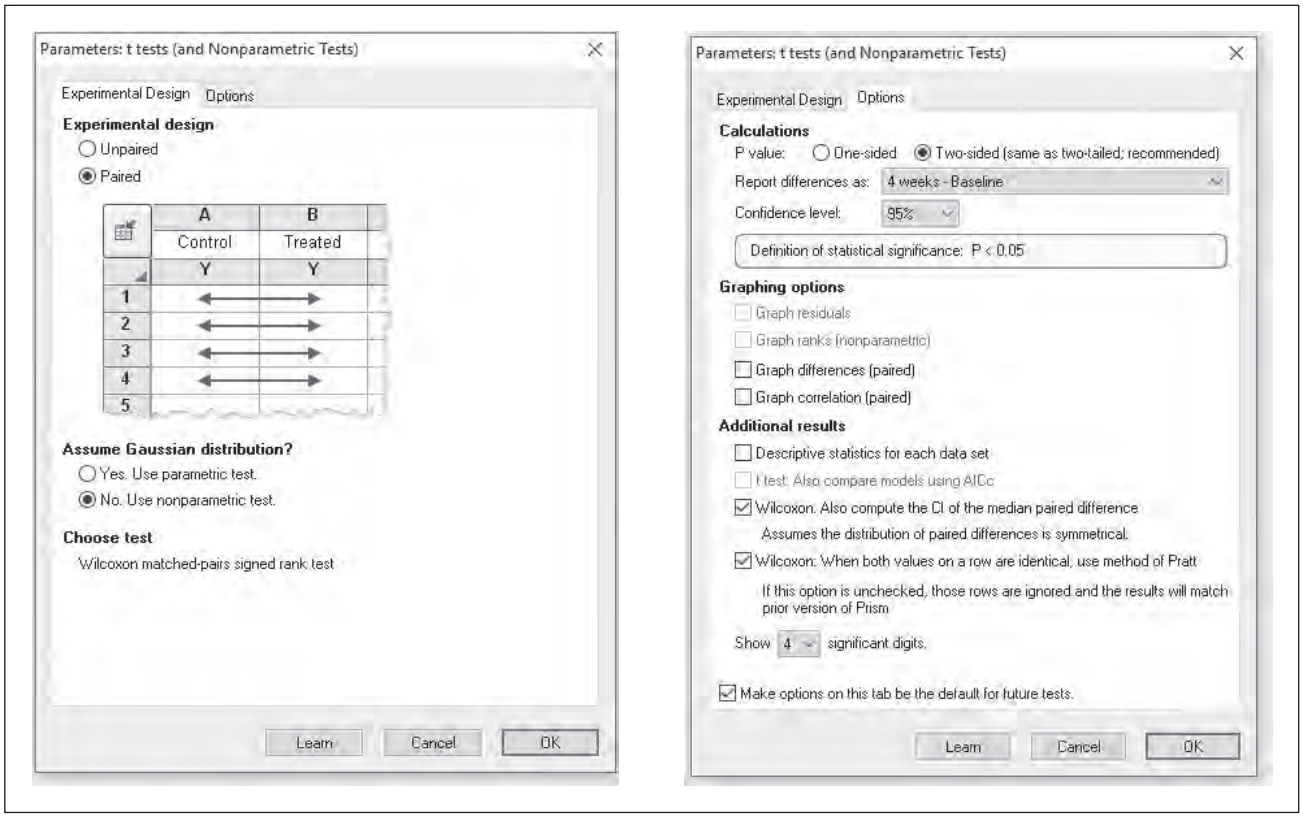

Figure 1. Analytical tool used in the survey.

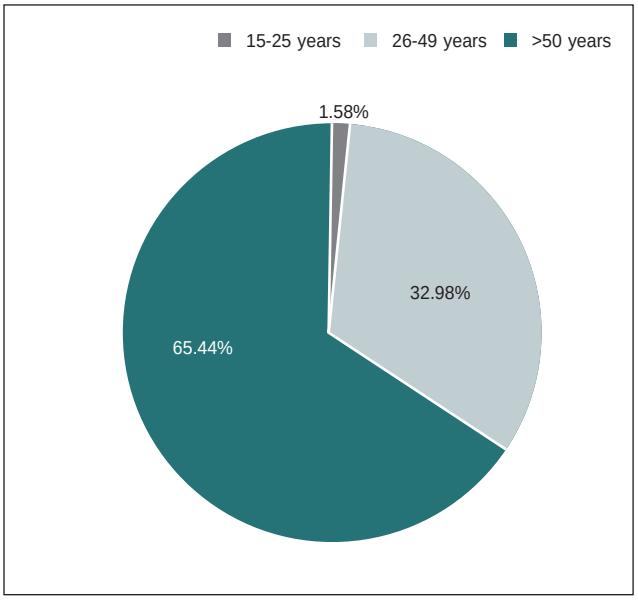

Figure 2. Distribution of patients with OA according to age.

<30 minutes was noted in 65.10% patients. On physical examination, 58.62% patients had small effusions (SE), 31.54% had joint line tenderness (JLT) and 9.84% had limited range of motion (LRM). The majority of patients had Grade I OA, followed by Grade II and Grade III (Fig. 5).

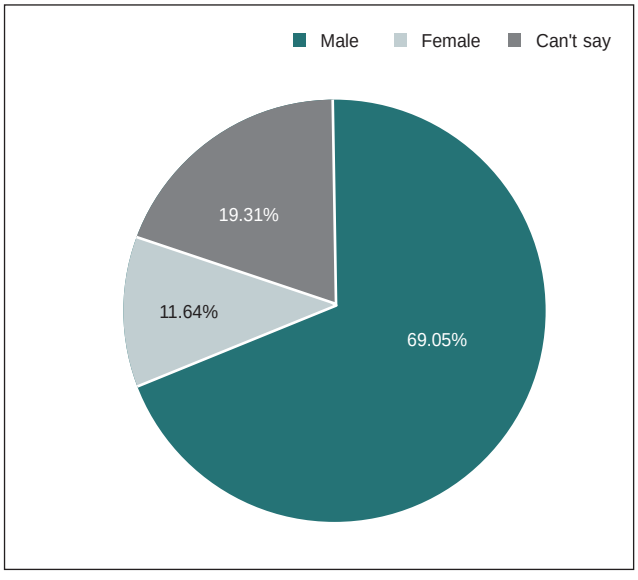

Figure 3. Distribution of patients with OA according to gender.

Note: Any doctors who selected more than one option (i.e., I & II both or I & III or II & III both or all 3 options) were considered under category III (i.e., can't say).

There was a statistically significant increase in the number of patients who were able to drive a car or use public transport at the end of 4 weeks in comparison with the baseline (Table 1 and Fig. 6). Additionally,

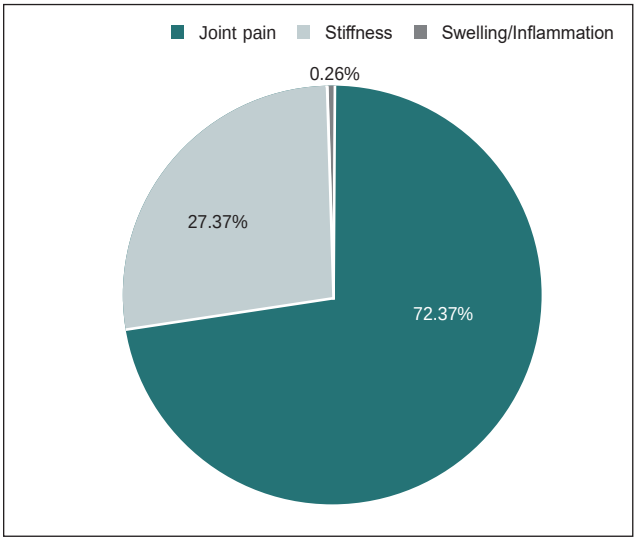

Figure 4. Frequency of symptoms noted in OA patients.

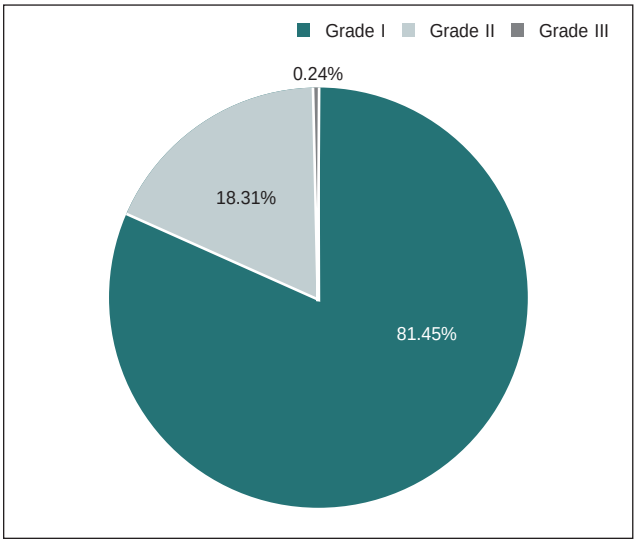

Figure 5. Grade of OA in study subjects.

a statistically significant increase was noted in the number of patients who were able to carry out vigorous activities like running and lifting heavy objects at the end of 4 weeks (Table 2). Statistically significant increase was also noted in the number of patients who were able to walk unassisted at the end of 4 weeks (Table 3). There was a statistically significant increase in the number of patients who were able to perform simple activities like writing with pen/pencil, comb/brush hair, reach shelves above head, dress on own and get out of bed without help at the end of 4 weeks (Fig. 7). There was a statistically significant reduction in frequency of severe pain (Table 4) as well as morning stiffness in patients at the end of 4 weeks (Table 5). There was a statistically significant increase in the number of patients who were able to sleep at night at the end of

Table 1. Ability of Patients to Drive a Car or Use Public Transport at Baseline Compared to 4 Weeks After Intervention

Scale	% Baseline	% End of 4 weeks
1	10.74	11.03
2	25.06	13.08
3	35.55	23.33
4	16.37	40.00
5	12.28	12.56

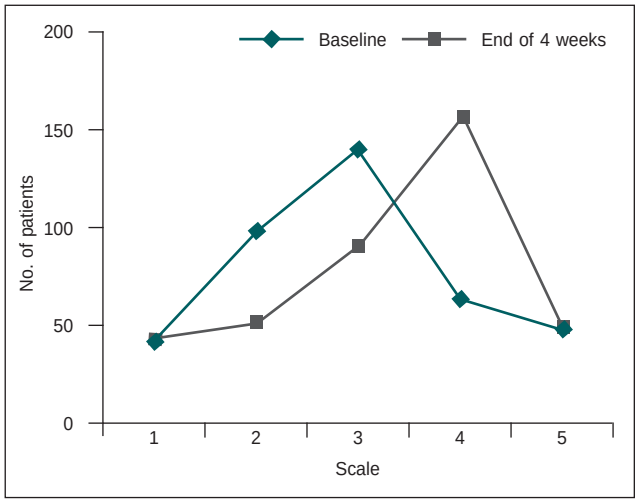

Figure 6. Significant shift towards higher scale for driving or using public transport at the end of 4 weeks.

Table 2. Ability of Patients to Carry Out Vigorous Activities at Baseline Compared to 4 Weeks After Intervention

Scale	% Baseline	% End of 4 weeks
1	25.58	11.00
2	27.11	20.46
3	25.32	39.13
4	13.04	23.53
5	8.95	5.88

4 weeks (Table 6 and Fig. 8). A statistically significant increase was noted in the number of patients who were able to indulge in social activities at the end of 4 weeks (Table 7). Statistically significant increase was also noted in the distance covered by patients in 6-minute walk test at the end of 4 weeks. More number of patients could cover longer distance in 6-minute walk test after 4 weeks as compared to baseline (Table 8).

Table 3. Ability of Patients to Walk Unassisted at Baseline Compared to 4 Weeks After Intervention

Scale	% Baseline	% End of 4 weeks
1	1.79	8.70
2	24.30	11.76
3	34.78	22.76
4	23.27	34.78
5	15.86	21.99

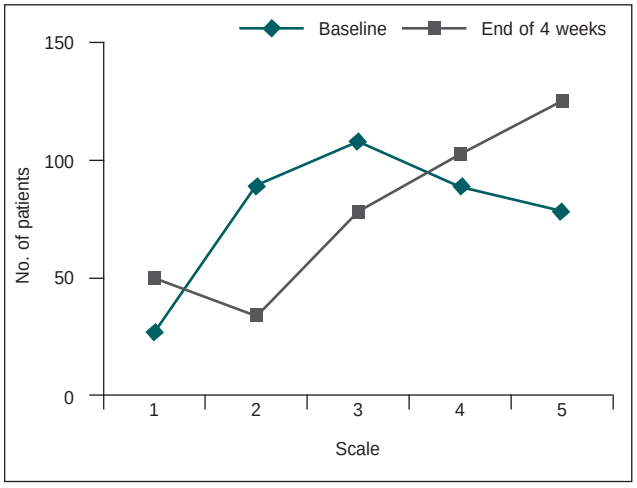

Figure 7. Significant shift towards higher scale for being able to perform simple activities after 4 weeks as compared to baseline.

Table 4. Frequency of Severe Pain from Arthritis at Baseline and at 4 Weeks Post-intervention

Scale	% Baseline	% End of 4 weeks
1	1.02	24.30
2	17.39	33.50
3	32.23	18.67
4	34.27	19.69
5	15.09	3.84

Table 5. Frequency of Morning Stiffness for Over an Hour at Baseline and at 4 Weeks Post-intervention

Scale	% Baseline	% End of 4 weeks
1	9.46	31.97
2	22.25	27.88
3	29.16	18.93
4	26.60	18.16
5	12.53	3.07

Table 6. Ability of Patients to Sleep at Night at Baseline Compared to 4 Weeks After Intervention

Scale	% Baseline	% End of 4 weeks
1	5.63	16.11
2	21.74	11.76
3	36.57	12.53
4	23.02	32.23
5	13.04	27.37

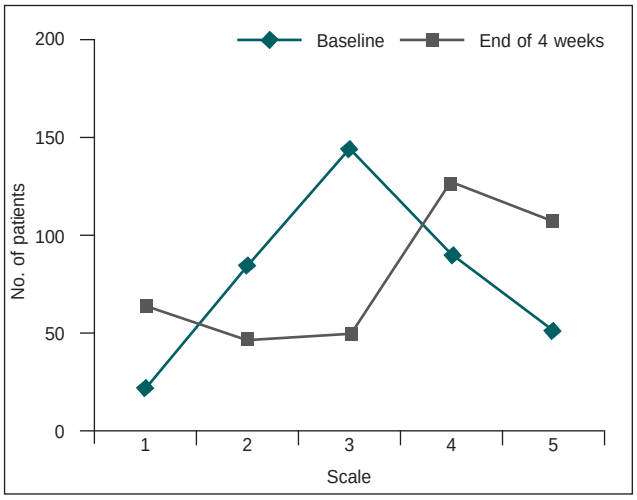

Figure 8. Significant shift towards higher scale for being able to sleep at night after 4 weeks as compared to baseline.

Table 7. Ability of Patients to Indulge in Social Activities at Baseline Compared to 4 Weeks After Intervention

Scale	% Baseline	% End of 4 weeks
1	4.86	12.02
2	19.44	11.00
3	43.73	20.72
4	24.81	33.50
5	7.16	22.76

Table 8. Ability of Patients to Cover Longer Distance at the End of 4 Weeks

Scale	% Baseline	% End of 4 weeks
1	4.09	10.23
2	26.60	12.53
3	39.64	17.65
4	21.74	36.06
5	7.93	23.53

DISCUSSION

Current therapeutic regimen of OA is plagued with several adverse effects associated with the use of NSAIDs. Additionally, there is suboptimal pain relief with the currently used analgesic options.

In the current survey, the effects of a hydrolyzed collagen type II combination, containing collagen type II, sodium hyaluronate, AKBA, curcuminiods and piperine, were analyzed in patients with OA. Symptoms were assessed before and after using the collagen combination. Treatment with the combination led to a statistically significant reduction in frequency of severe pain and morning stiffness, and increase in distance covered by patients in 6-minute walk test. The combination improved the overall quality of life of the patients involved in the survey.

OA is characterized by degeneration in both articular cartilage and subchondral bone. Delaying the progression of structural changes in the cartilage is a potential therapeutic target. Collagen type II is the key structural component of cartilage tissue.[7]

When administered orally, collagen hydrolysate is absorbed intestinally and accumulates in cartilage. Collagen hydrolysate yields a statistically significant increase in synthesis of extracellular matrix macromolecules by chondrocytes. This seems to benefit patients affected by joint disorders. Evidence suggests that collagen hydrolysate is safe to be used and improves some measures of pain and function in patients with OA or other arthritic conditions.[8] Collagen hydrolysate is hypothesized to influence bone metabolism.[9]

Oesser and Seifert supplemented culture medium with collagen hydrolysate and assessed the biosynthesis of type II collagen by chondrocytes. Presence of extracellular collagen hydrolysate resulted in a dose-dependent increase in type II collagen secretion.[10] Hydrolyzed collagen has the potential to increase bone mineral density, exert a protective effect on articular cartilage and yield symptomatic relief of pain.[11]

Bakilan and colleagues[7] assessed the efficacy of oral type II collagen treatment on the symptoms and biological markers of cartilage degradation, when given along with acetaminophen in patients with knee OA. After 3 months of treatment, significant improvements were noted in joint pain (VAS walking), function (WOMAC) and quality of life (SF-36) in comparison with baseline in the acetaminophen + type II collagen group, while only improvements in some subscales of the SF-36 survey and VAS walking were noted in the acetaminophen group. There was a significant difference in VAS walking score in favor of the acetaminophen + type II collagen group as compared to acetaminophen group.

Curcumin is a polyphenolic compound obtained from turmeric (*Curcuma longa*). It is known for its anti-inflammatory properties. The efficacy of curcumin has been found to be similar to that of ibuprofen for the treatment of knee OA.[12]

A recent study compared the efficacy and safety of curcumin with those of diclofenac in the treatment of knee OA and found curcumin to have similar efficacy to diclofenac. However, curcumin was better tolerated among patients with knee OA.[12]

Piperine, the active phenolic component in black pepper extract, has been shown to have anti-inflammatory, antinociceptive and antiarthritic effects.[13] Piperine exerts anti-inflammatory activity in human OA chondrocytes. It checks the IL-1β-induced overexpression of inflammatory mediators.[14]

5-Loxin, a Boswellia serrata extract, is enriched with 30% AKBA. It has potential anti-inflammatory properties. A study assessed the efficacy and safety of 5-Loxin in the treatment of OA of the knee and noted that 5-Loxin reduced pain and improved physical functioning significantly in OA patients and is safe for human consumption.[15]

Hyaluronan (HA) is known to slow down the disease progression in OA. Exogenous HA enhances endogenous HA synthesis, stimulates proteoglycan synthesis and inhibits the release of chondrodegrading enzymes. It also inhibits mononuclear cell phagocytosis and leukocyte migration, chemotaxis and phagocytosis.[16] HA has been reported to be effective in relieving pain of OA and provide a relatively safe alternative for patients for whom conventional therapy has not been effective.[17]

All the components of this combination are known to have the potential to provide relief in OA on account of their anti-inflammatory, analgesic and various other properties.

CONCLUSION

The following conclusions could be drawn from the survey:

- Osteoarthritis is most commonly seen in people aged over 50 and shows male preponderance. Grade I OA is the most common presentation.

- Joint pain is the most common symptom of OA, which can usually be present even at rest.
- Morning stiffness for <30 minutes is common in OA patients.
  - Four weeks of treatment with a combination of collagen type II, sodium hyaluronate, AKBA, curcuminiods and piperine leads to statistically significant increase in number of patients that are able to drive a car or use public transport; carry out vigorous activities; walk unassisted; perform simple activities like writing, combing hair, reach shelves above head, etc.; sleep at night and indulge in social activities.
- Treatment with the combination also led to–
  - Statistically significant reduction in frequency of severe pain
  - Statistically significant reduction in frequency of morning stiffness
  - Statistically significant increase in distance covered by patients in 6-minute walk test.

A combination of collagen type II, sodium hyaluronate, AKBA, curcuminiods and piperine therefore seems a potential therapeutic option in OA patients over 50 years of age to relieve their symptoms and improve their quality of life.

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A Study of Tissue Doppler Echocardiography in Patients with Restrictive Physiology

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ABSTRACT

Introduction: Cardiovascular patients presenting with restrictive ventricular physiology are known to have left ventricular diastolic dysfunction. The cardiovascular diseases included in this category presenting with diastolic dysfunction are restrictive cardiomyopathy (RCMP), chronic constrictive pericarditis (CCP) and hypertrophic cardiomyopathy (HCM). The gold standard test to differentiate between CCP and RCMP is cardiac catheterization, which is an invasive procedure. With the introduction of tissue Doppler echocardiography, these conditions may be diagnosed accurately in most of the cases. **Material and methods:** Thirty patients of RCMP, CCP and HCM by history, examination and conventional echocardiography were included in the study. All were subjected to tissue Doppler echocardiography. E, A, Ea, E/A and E/Ea were measured. Results were statistically analyzed using ANOVA and Fisher's test. **Results:** Mean E value was highest for patients with RCMP (89.66 ± 12.08) followed by CCP (76.15 ± 13.47) and least for HCM (65.12 ± 22.53) patients. Mean A value was highest for HCM (62.12 ± 16.26) patients followed by RCMP (52.66 ± 21.54) and least for CCP (51.01 ± 21.38) patients. Mean Ea value was highest in CCP patients (10.23 ± 1.92) followed by HCM (6.01 ± 1.11) and least for RCMP patients (5.25 ± 1.28). The mean values of E/Ea in patients with CCP, HCM and RCMP were 7.60 ± 1.66, 12.36 ± 2.52 and 15.30 ± 2.47, respectively. Thus, Ea values were significantly higher in CCP patients as compared to RCMP and HCM patients and reverse was true for E/Ea values. **Conclusion:** The present study showed that tissue Doppler imaging provides additional information to accurately discriminate between CCP and RCMP and may obviate the need of cardiac catheterization and has additive value in the diagnosis of HCM.

Keywords: Tissue Doppler echocardiography, cardiovascular, restrictive ventricular physiology, Doppler echocardiography

Cardiovascular patients presenting with restrictive ventricular physiology are known to have left ventricular diastolic dysfunction. The cardiovascular diseases included in this category presenting with diastolic dysfunction are restrictive cardiomyopathy (RCMP), chronic constrictive pericarditis (CCP) and hypertrophic cardiomyopathy (HCM).

The conventional way of diagnosing these conditions is mitral valve inflow velocity pattern in Doppler echocardiography. The various patterns are Grade I to Grade IV diastolic dysfunction. In Grade I diastolic dysfunction, an abnormal relaxation pattern is seen on the mitral flow velocity curve and consists of a low E velocity, prolongation of the deceleration time (DT) and increased filling at atrial contraction. With Grade II diastolic dysfunction, there is a pseudonormalization pattern (E>A) on the mitral flow velocity curves and decreased DT. Patients with Grade III and IV diastolic dysfunction have a restrictive filling pattern on the mitral flow velocity curves, with E>A and E/A ratio >2. HCM shows typical echocardiographic findings and only a few patients will need other imaging and genetic studies to confirm the diagnosis. The gold standard test to differentiate between CCP and RCMP is cardiac catheterization which is an invasive procedure. With the introduction of tissue Doppler echocardiography, these conditions may be diagnosed accurately in most of the cases. So, a study is needed to evaluate the efficacy of tissue Doppler echocardiography in differentiating these conditions to obviate the need for invasive cardiac catheterization.

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MATERIAL AND METHODS

The present study was conducted on patients presenting with clinical and conventional echocardiographic features of CCP, RCMP and HCM. All patients were subjected to complete evaluation by history and examination as per the protocol and were taken up for tissue Doppler echocardiography.

Inclusion Criteria

All patients with the clinical and conventional echocardiographic features consistent with the diagnosis of CCP, RCMP and HCM were included in the study.

Exclusion Criteria

- Patients with associated cardiovascular disorders (CVDs): Congenital heart disease, valvular heart disease, dilated cardiomyopathy, hypertensive heart disease, ischemic heart disease.
- Patients with lung pathology.

Echocardiography including 2D, M mode and tissue Doppler was done in each patient. The leading edge of the mitral flow pattern was traced to derive peak early (E) and atrial (A) velocities, E/A ratio and E deceleration time (DT). The septal early diastolic mitral annular velocities (Ea) were measured by spectral tissue Doppler imaging (TDI) in apical four-chamber view.

STATISTICAL ANALYSIS

All data were analyzed using SPSS software version 25. Continuous variables with normal distribution were expressed as mean ± standard deviation, and the differences were assessed with analysis of variance (ANOVA). Categorical variables were presented as absolute and relative frequencies, and the differences were assessed with Fisher's test. A 'p' value of less than 0.05 was considered statistically significant.

RESULTS

Out of 30 patients included in the study, 67% were male and 33% were female. Maximum patients were in the age group of 41-60 years. Majority of patients presented in the New York Heart Association (NYHA) Class III and IV. Majority of patients who presented with NYHA Class III/IV were of RCMP or CCP group and majority of patients who presented with NYHA Class I/II were of HCM group. Mean systolic blood pressure (SBP) in patients with CCP was 115.23 ± 9.78 mmHg and mean diastolic blood pressure (DBP) was 76.76 ± 7.18 mmHg. In patients with HCM, mean SBP was 117.50 ± 12.03 mmHg and mean DBP was 73.75 ± 7.44 mmHg; whereas in patients with RCMP, mean SBP was 122.88 ± 24.98 mmHg and mean DBP was 77.33 ± 14.45 mmHg (Table 1). Among different ECG changes, majority (17) had normal sinus rhythm. Atrial fibrillation was present in 8 patients out of which 4 were of CCP group and 4 were of RCMP group. Left ventricular hypertrophy was present in 4 patients; all of them were of HCM group ($p < 0.05$) (Table 2). Table 3 summarizes the 2D echocardiography findings in different study groups.

Table 1. Pulse and Blood Pressure Values in Patients of Study Groups

Variables	CCP	HCM	RCMP	F value	P value
Pulse (/min)	90.92 ± 18.84	90.50 ± 9.42	86.44 ± 15.86	0.232	P > 0.05
SBP (mmHg)	115.23 ± 9.78	117.50 ± 12.03	122.88 ± 24.98	0.597	P > 0.05
DBP (mmHg)	76.76 ± 7.18	73.75 ± 7.44	77.33 ± 14.45	0.321	P > 0.05

Table 2. Number of Patients Showing Different Electrocardiography and Chest X-ray Findings in Study Groups

ECG findings	CCP	HCM	RCMP
Normal sinus rhythm	8	4	5
Atrial fibrillation	4	0	4
Left ventricular hypertrophy	0	4	0
Sinus tachycardia	1	0	0
Chest X-ray finding			
Cardiomegaly	12	8	8
Within normal limit	1	0	1

Table 3. Number of Patients Showing Various 2D Echocardiography Findings in Study Groups

2D echo finding	CCP	HCM	RCMP
Mitral regurgitation	3	2	4
Tricuspid regurgitation	4	0	4
Thickened pericardium	13	0	0
Septal bounce	7	0	0
Asymmetric septal hypertrophy	0	8	0
Pericardial effusion	0	0	1

Table 4. Different Echocardiographic Variables in the Study Group

Variables	CCP	HCM	RCMP	F value	P value
LA diameter (mm)	46.15 ± 5.36	30.01 ± 8.40	47.77 ± 2.58	25.29	P < 0.001
AO (mm)	28.61 ± 4.01	25.50 ± 4.81	28.01 ± 4.89	0.553	P > 0.05
IVSd (mm)	9.46 ± 1.0	15.62 ± 2.55	10.22 ± 1.64	34.14	P < 0.001
LVSD (mm)	34.38 ± 4.94	32.87 ± 4.38	37.11 ± 8.05	1.14	P > 0.05
E (ms)	76.15 ± 13.47	65.12 ± 22.53	89.66 ± 12.08	5.04	P < 0.05
A (ms)	51.01 ± 21.38	62.12 ± 16.26	52.66 ±21.54	0.801	P > 0.05
Ea (cm/s)	10.23 ± 1.92	5.25 ± 1.28	6.01 ± 1.11	32.24	P < 0.001
E/A	1.71 ± 0.60	1.14 ± 0.56	1.91 ± 0.65	3.64	P < 0.05
E/Ea	7.60 ± 1.66	12.36 ± 2.52	15.30 ± 2.47	35.14	P < 0.001

Left atrium was dilated in 12 out of 13 patients with CCP with cut-off value of 34 and mean value of left atrial (LA) diameter being 46.15 ± 5.36 mm in this subset of patients. All 9 patients with RCMP had dilated LA with mean LA diameter of 47.77 ± 2.58 mm. Only 1 patient with HCM had dilated left atrium with mean LA diameter of 30.01 ± 8.40 mm ($p < 0.001$).

Interventricular septum thickness (IVSd) values were raised in all patients with HCM with mean value of 15.62 ± 2.55 mm. Two patients with RCMP had raised values of IVSd with mean value of 10.22 ± 1.64 mm. All the patients with CCP had normal values of IVSd with a mean of 9.46 ± 1.0 mm ($p < 0.001$). Value of left ventricular systolic dysfunction (LVSD) was raised in 1 out of 13 CCP patients with mean value of 34.38 ± 4.94 mm, 1 out of 8 HCM patients with mean value of 32.87 ± 4.38 mm and 3 out of 9 RCMP patients with mean value of 37.11 ± 8.05 mm ($p > 0.05$). E values were highest in patients of RCMP with mean value of 89.66 ± 12.08 ms, followed by CCP where mean value was 76.15 ± 13.47 ms.

In patients of HCM mean value of E was 65.12 ± 22.53 ms ($p < 0.05$). A values were highest in patients of HCM with mean value of 62.12 ± 16.26 ms, followed by RCMP where mean value was 52.66 ± 21.54 ms. In patients of CCP, mean value of A was 51.01 ± 21.38 ms ($p > 0.05$). Ea value was highest in patients with CCP, with a mean value of 10.23 ± 1.92 cm/s and lowest in patients with HCM with mean value of 5.25 ± 1.28 cm/s. In patients with RCMP, mean value was 6.01 ± 1.11 cm/s ($p < 0.001$).

The mean values of E/A in patients with CCP, HCM and RCMP were 1.71 ± 0.60, 1.14 ± 0.56 and 1.91 ± 0.65, respectively ($p < 0.05$). The mean values of E/Ea in patients with CCP, HCM and RCMP were 7.60 ± 1.66, 12.36 ± 2.52 and 15.30 ± 2.47, respectively ($p < 0.001$) (Table 4).

DISCUSSION

The primary finding of this study is that measurement of E, A and Ea velocities and E/Ea and E/A ratios is useful in differentiating conditions like RCMP, CCP and HCM. The mean E (early diastolic transmitral flow) velocity in patients with CCP was 76.15 ± 13.47 ms in the present study, similar to another study where mean E velocity was 77.9 ± 20.7 ms. In patients with RCMP, the mean E velocity in this study was 89.66 ± 12.08 ms, which was similar to another study where mean E velocity was 89.3 ± 25.6 ms. The mean value of A velocity in our study was 51.01 ± 21.38 ms for CCP patients and 52.66 ± 21.54 ms for RCMP patients, unlike previous studies where mean value of A velocity was lower for RCMP patients. This difference may be due to the fact that in previous studies, patients with RCMP had atrial fibrillation or severe restrictive pattern, where values of A velocity are grossly reduced due to absence of atrial contraction. The mean E/A velocity in this study among different categories, viz. CCP, RCMP and HCM, were within normal limits. This observation points that majority of patients in the study were having Grade II diastolic dysfunction where there is pseudo-normalization pattern.

The principal finding of the present study was that Ea measurement by tissue Doppler echocardiography provides an accurate discrimination between constrictive pericarditis and RCMP when a cut-off value of 8 cm/s was used. Out of 13 patients of CCP group, all had Ea >8 cm/s and among patients with

RCMP and HCM group all were having Ea ≤8 cm/s, i.e., Ea measurement has a 100% sensitivity and specificity in differentiating constriction vs. restriction if cut-off value of 8 cm/s is used. In a study, Ea was significantly higher in patients who had constrictive pericarditis than those who had RCMP or cardiac amyloidosis (12.3 ± 4.0 cm/s vs. 5.1 ± 1.5 cm/s), which resulted in 95% sensitivity and 96% specificity for the diagnosis of constrictive pericarditis. Similar results were confirmed by another study where Ea values provided accurate discrimination between CCP and RCM; however, sensitivity was decreased when a cut-off value of >8 cm/s was used for discrimination. In another study, using tissue Doppler echocardiography, a peak Ea of ≥8.0 cm/s differentiated patients with constriction from restriction with 89% sensitivity and 100% specificity. The normal or even accentuated Ea in constrictive pericarditis is probably attributable in large part to the exaggerated longitudinal motion of the mitral annulus, because circumferential expansion of the entire heart is limited by constricting pericardium.

Finally, the mean value of E/Ea was highest in patients with RCMP, followed by HCM and lowest in patients with CCP (15.30 ± 2.47, 12.36 ± 2.52 and 7.60 ± 1.66, respectively). Similar findings were seen in previous studies where value of E/Ea was significantly lower in patients with CCP as compared to patients with RCMP (9.1 ± 3.4 vs. 22.2 ± 11.4). When comparing RCMP and HCM patients on the basis of E/Ea, values were higher in patients with RCMP, similar to the results that were seen in a study where the mean value of E/Ea was 24 ± 7 and 15 ± 7 in patients with RCMP and CCP, respectively.

CONCLUSION

The current study highlights that TDI provides additional information to accurately discriminate between CCP and RCMP. Information obtained from TDI and in conjunction with traditional echocardiographic findings may obviate the need for cardiac catheterization in these patients. In HCM also, TDI may further confirm the diagnosis based on 2D echocardiography.

However, TDI has limitations in patients having thickened mitral/tricuspid annulus. Another modality, speckle tracking echocardiography (STE) may be used in further studies for differentiating between CCP and RCMP. Regional longitudinal strain measured with STE may avoid the limitations of tissue Doppler annular velocities with thickened annulus. The ratio of left ventricular free wall strain/septal strain is used to differentiate CCP and RCMP.

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To Study the Prevalence of Vitamin D Deficiency and the Role of Vitamin D Supplementation on Insulin Resistance Among Women with PCOS

SHIKHA SINGH*, RUCHIKA GARG†, SAROJ SINGH‡, BT KOKILA#

ABSTRACT

Background: Polycystic ovary syndrome (PCOS) is the most commonly diagnosed female endocrine disorder. PCOS patients have lower insulin sensitivity and an elevated risk for insulin resistance. This may contribute to the low vitamin D concentration because vitamin D might directly increase insulin sensitivity via stimulating the expression of insulin receptors in peripheral tissues. **Objectives:** To study the prevalence of vitamin D deficiency and the role of vitamin D supplementation on insulin resistance among women with PCOS attending OPD of Dept. of Obstetrics and Gynecology, SN Medical College, Agra, Uttar Pradesh. **Methods:** Patients diagnosed with PCOS in accordance to Rotterdam criteria underwent detailed history and examination. In the study group (n = 99), patients were supplemented with vitamin D 60,000 IU weekly and metformin daily for 8 weeks, whereas control group (n = 95) was given metformin daily for the same period. 25-hydroxyvitamin D levels were measured by means of enzyme-linked immunosorbent assay (ELISA). Homeostatic model assessment for insulin resistance (HOMA-IR) was calculated using HOMA-IR = [fasting insulin (mIU/L) × fasting sugar (mg/dL)/405. **Results:** Overall, 1715 patients who had complaints of menstrual irregularities and/or infertility and/or hirsutism were screened for PCOS and out of them, 672 were diagnosed as having PCOS. Among these, 91.2% were found to be vitamin D deficient and 51.8% were found to be insulin resistant. Among insulin resistant cases, 97.8% cases were also found to be vitamin D deficient. In our study, it was documented that combination of vitamin D with insulin sensitizer like metformin helped in a better way than metformin alone among insulin resistant PCOS women after 8 weeks in regularization of menstrual irregularities, normalization of polycystic ovary morphology (PCOM) on ultrasonography and improving insulin sensitivity. **Conclusion:** Both vitamin D and metformin combination, and metformin alone are effective in treating PCOS but former was found to be more effective and associated with lesser side effects.

Keywords: Vitamin D deficiency, PCOS, HOMA-IR

Polycystic ovary syndrome (PCOS) is the most commonly diagnosed female endocrine disorder, with a prevalence rate of nearly 5-10% among women of reproductive age. PCOS is characterized by elevated ovarian secretion of adrenal androgens, hyperandrogenic symptoms, including hirsutism, menstrual irregularity, acne and/or alopecia, as well as polycystic ovaries. PCOS is defined according to Rotterdam ESHRE/ASRM revised 2003 criteria. In 2003, a consensus workshop sponsored by ESHRE/ASRM in Rotterdam indicated PCOS to be present if any 2 out of 3 criteria are met - Clinical and/or biochemical signs of hyperandrogenism; *OR* Oligo/anovulation; *OR* Polycystic ovaries on ultrasound.

The primary etiology of PCOS has not yet been determined, but it is hypothesized that dysfunction of glucose and insulin metabolism leads to increasing symptoms of androgen excess, which in turn, results in worsening of metabolic function and obesity. Increased weight gain is attributed to insulin resistance and induces more hyperandrogenic effects. Insulin resistance leads to hyperinsulinemia, more consistently in obese PCOS patients.

Insulin resistance plays a central pathophysiological role in the majority of women with PCOS. Vitamin D deficiency has been demonstrated to play an important

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role in the development of insulin resistance. Insulin resistance has been reported in 76.9% of women with PCOS from India.

Vitamin D deficiency is prevalent worldwide and is becoming increasingly common among women of reproductive age with a prevalence of 70-100% in the Indian general population.

PCOS patients have lower insulin sensitivity and an elevated risk for insulin resistance. This may contribute to the low vitamin D concentration because vitamin D might directly increase insulin sensitivity via stimulating the expression of insulin receptors in peripheral tissues. Insulin resistance is evaluated using the homeostatic model assessment for insulin resistance (HOMA-IR) and high HOMA-IR suggests increased insulin resistance.

AIM AND OBJECTIVES

Aim

To study the prevalence of vitamin D deficiency and the role of vitamin D supplementation on insulin resistance among women with PCOS attending OPD of Dept. of Obstetrics and Gynecology, SN Medical College (SNMC), Agra, Uttar Pradesh.

Objectives

- To study the prevalence of vitamin D deficiency among PCOS women, attending OPD of Dept. of Obstetrics and Gynecology, SNMC, Agra, Uttar Pradesh.
- To study the demographic profile of women with PCOS.
- To study the role of vitamin D supplementation on insulin resistance.

SUBJECTS AND METHODS

The study was conducted on patients attending Gynecology OPD in the Dept. of Obstetrics and Gynecology, SNMC, Agra and the ethical clearance was taken for the same.

Subjects

Diagnosed cases of PCOS according to Rotterdam ESHRE/ASRM revised 2003 criteria with presence of any two of the following three criteria were recruited for the study:

- Oligo/anovulation
- Clinical and/or biochemical signs of hyperandrogenism
- Polycystic ovarian morphology (PCOM) on ultrasound examination - >12 follicles size 2-9 mm and/or ovarian volume >10 mL.

Methods

This was a prospective, interventional, double-blinded comparative study done from October 2015 to September 2017 in the Dept. of Obstetrics and Gynecology, SN Medical College and Hospital, Agra, Uttar Pradesh.

Criteria for inclusion

- Cases diagnosed to have PCOS according to Rotterdam ESHRE/ASRM revised 2003 criteria.
- Vitamin D deficient <20 ng/dL
- Insulin resistance as per HOMA-IR ≥2.5.
- Age range, 18-45 years.

Criteria for exclusion

- Women who used any medication that could interfere with the normal function of the hypothalamic-pituitary-gonadal axis or calciotropic hormone concentrations such as use of insulin sensitizers, oral contraceptives, antiepileptics, vitamin D and calcium supplements and known systemic disorders (e.g., hypertension, diabetes, urolithiasis, inflammatory bowel disease).
- Patients with hyperprolactinemia and thyroid dysfunction, late onset congenital adrenal hyperplasia.
- Those with other common causes of hyperandrogenemia and/or anovulation (congenital adrenal hyperplasia, Cushing syndrome and virilizing ovarian or adrenal tumors).

Institutional approval was obtained and a written informed consent was signed by all subjects.

Patients diagnosed with PCOS in accordance to Rotterdam criteria underwent detailed history and examination; weight, height were taken; hirsutism scoring based on modified Ferriman and Gallwey scale was done and hormonal profile was sent to rule out other endocrine disorders and insulin resistance (HOMA-IR) calculations were done according to the formula:

HOMA-IR = [Fasting insulin (mIU/L) × fasting sugar (mg/dL)/405

Healthy range 1.0 (0.5-1.9)

Less than 2.0: insulin sensitive which is optimal

Above 2 and <2.5: early insulin resistance

Above 2.5: significant insulin resistance.

Preparatory phase: Participants were advised to avoid excessive consumption of dairy products for at least 1 week and to avoid sunlight exposure for 1 day before measurements.

Assay methods: Plasma glucose concentrations were measured with the glucose oxidase technique on an automated analyzer. 1,25-dihydroxyvitamin D ($1,25(OH)_2D$) was measured with radioimmunoassay methods. Serum insulin concentrations were measured with an enzyme-linked immunosorbent assay (ELISA).

1. *Special investigations*:

   Serum vitamin D-

Specimen required:	0.5 mL serum
Collection container:	3 mL light-green-top (plasma separator) tube preferred
Patient preparation:	Fasting is preferred.
Specimen processing instructions:	Allow serum to clot. Centrifuge serum or plasma at 1,100-2,000 g for 10 minutes. Separate from cells immediately.
Transport temperature:	Refrigerated, 2-8°C.

2. ***Fasting insulin level:*** Patients were asked to fast for 8 hours before blood was collected.
3. ***Ultrasound:*** Diagnosis of PCOS by USG - The patients after detailed history, examination and counseling were called for ultrasound examination in our department.

PCOM was identified according to current recommended sonographic criteria for multifollicular ovarian morphology:

- 25 or more follicles per ovary (superseding the earlier Rotterdam criteria of 12 or more follicles)
- Increased ovarian size (>10 cc).

Other morphological features include:

- Hyperechoic central stroma
- Peripheral location of follicles: which can give a string of pearl appearance
- Follicles of similar size measuring 2-9 mm.

The presence of a single PCO is sufficient to provide the diagnosis. Transabdominal ultrasound was performed in cases in whom transvaginal sonography was not possible.

A total of 200 patients were found to be eligible. Among these, about 6 cases dropped out during study period. Participants were randomized by block randomization with sealed envelope system done in two groups.

In Group I, 99 insulin resistant PCOS cases were given supplementation with 60,000 IU of oral vitamin D_3 weekly along with an insulin sensitizer metformin daily for 8 weeks.

In Group II, 95 insulin resistant PCOS cases were given only metformin 500 mg daily for 8 weeks.

Patients were followed-up after 2 months.

Statistical Analysis and Study Design

It was a cross-sectional hospital-based trial carried out in the Dept. of Obstetrics and Gynecology after the approval of college ethical committee.

The data was entered in MS Excel and analyzed using SPSS version 18. Standard statistical techniques were applied according to suitability of data. Sample *t*-test was used for comparison; 'p' value <0.05 was considered statistically significant.

RESULTS

Overall, 1715 patients had complaints of menstrual irregularities and/or infertility and/or hirsutism and were screened for PCOS according to Revised Rotterdam criteria. Out of them, 672 were diagnosed as having PCOS. Among these, 613 (91.2%) were found to be vitamin D-deficient and 348 (51.8%) were found to be insulin-resistant. Among insulin-resistant PCOS cases, 338 (97.1%) cases were also found to vitamin D-deficient.

Table 1 shows that the difference in mean age of both groups was not statistically significant and majority of the PCOS cases belonged to 18-25 years age group.

Both groups were not significantly different in terms of marital status (p = 0.7591). In Group I, 64.62% of the married females were suffering from infertility, of which 61.91% and 38.09% of the cases had primary and

Table 1. Distribution of Cases According to Age

Age	Group I (n = 99)		Group II (n = 95)	
	No.	%	No.	%
18-25	57	57.58	53	55.79
26-35	32	32.32	35	36.84
36-45	10	10.10	7	7.37
Mean ± SD	25.02 ± 5.99		24.48 ± 5.59	
P value	0.5168			

secondary infertility, respectively. In Group II, 69.49% of the married females were suffering from infertility, of which 65.85% and 34.15% of the cases were having primary and secondary infertility, respectively (Table 2).

Most common menstrual irregularities seen among PCOS women were oligomenorrhea followed by amenorrhea. After 8 weeks, normalization of menstrual cycle was seen in about 79.8% and 68.42% of cases in Group I and II, respectively (Table 3), which is independently significant and the difference between the two was also statistically significant (p = 0.0155).

The difference between baseline mean body mass index (BMI) in both the groups was not statistically significant. After 8 weeks of treatment, in Group I, the difference in mean from baseline was 1.89 ± 0.14. In Group II, the difference in mean from baseline was 0.74 ± 0.55. The difference between the mean of both groups at 8 weeks (25.40 ± 2.46 vs. 26.60 ± 2.03) was statistically significant (Table 4).

Improvements in ultrasonographic findings were about 40.41% and 27.37% in Group I and Group II, respectively (Table 5) and the difference between the two was statistically significant (p = 0.0152).

Table 2. Distribution of Cases According to Marital Status and Infertility

Marital status	Group I (n = 99)		Group II (n = 95)	
	No.	%	No.	%
Married	65	65.66	59	62.11
Primary infertility	26	61.91	27	65.85
Secondary infertility	16	38.09	14	34.15
Unmarried	34	34.34	36	37.89

Table 3. Distribution of Cases According to Menstrual Irregularities

Menstrual irregularities	Baseline				8 weeks			
	Group I (n = 99)		Group II (n = 95)		Group I (n = 99)		Group II (n = 95)	
	No.	%	No.	%	No.	%	No.	%
Oligomenorrhea	66	66.67	64	67.37	14	14.14	20	21.05
Amenorrhea	17	17.17	19	20.00	5	5.05	9	9.48
Menorrhagia/Polymenorrhea	7	7.07	5	5.26	1	1.01	1	1.05
Regular	9	9.09	7	7.37	79	79.8	65	68.42
P value	0.8821				<0.001*			

Table 4. Distribution of Cases According to BMI

BMI	Baseline				8 weeks			
	Group I (n = 99)		Group II (n = 95)		Group I (n = 99)		Group II (n = 95)	
	No.	%	No.	%	No.	%	No.	%
<25	25	25.25	24	16.84	42	42.42	33	34.74
25-29.9	71	71.71	69	76.84	56	56.57	61	64.21
30-34.9	2	2.02	2	6.32	1	1.01	1	1.05
>35	1	1.01	0	0.00	0	0.00	0	0
Mean ± SD	27.29 ± 2.32		27.34 ± 1.48		25.40 ± 2.46		26.60 ± 2.03	
't' value	–0.1797				–0.6187			
P value	0.8576				0.0002*			

Table 5. Distribution of Cases According to Ultrasonographic Finding

USG findings	Baseline				8 weeks			
	Group I (n = 99)		Group II (n = 95)		Group I (n = 99)		Group II (n = 95)	
	No.	%	No.	%	No.	%	No.	%
PCOM on USG	80	80.81	76	80.00	40	40.4	50	52.63
Normal	19	19.19	19	20.00	59	59.6	45	47.37
P value	>0.9999				0.0152			

Table 6. Distribution of Cases According to HOMA-IR

HOMA-IR	Baseline				8 weeks			
	Group I (n = 99)		Group II (n = 95)		Group I (n = 99)		Group II (n = 95)	
	No.	%	No.	%	No.	%	No.	%
<2.5	0	0	1	1.0	61	61.62	42	44.21
2.5-3	36	36.4	34	35.8	23	23.23	28	29.47
>3	63	63.63	60	63.2	15	15.15	25	26.32
Mean ± SD	3.46 ± 0.96		3.32 ± 0.92		2.12 ± 0.80		2.45 ± 1.03	
't' value	1.0372				-3.0877			
P value	0.3009				0.0023*			

*

In Group I and II, the baseline mean HOMA-IR was 3.46 ± 0.96 and 3.32 ± 0.92, respectively. After 8 weeks of treatment, in Group I, the difference in mean from baseline was 1.34 ± 0.16 and in Group II, it was 0.87 ± 0.11. But the difference between the mean of both groups at 8 weeks (2.12 ± 0.8 vs. 2.45 ± 1.03) was statistically significant (Table 6).

In our study, it was documented that combination of vitamin D with insulin sensitizer like metformin helped in a better way than metformin alone among insulin resistant PCOS women after 8 weeks in regularization of menstrual irregularities, normalization of PCOM on ultrasonography and improving insulin sensitivity.

DISCUSSION

Researches are mainly focused on improving insulin resistance in PCOS patients which has been proven to be one of the main pathophysiological contributors for the development of PCOS. Along with incidence of insulin resistance in our study population, there was vitamin D deficiency, implying that perhaps the benefit of vitamin D supplementation may lie in mitigating progression of overt diabetes or in abnormalities of glucose homeostasis. In our study, it was documented that prevalence of vitamin D deficiency in PCOS women was 91.2% and insulin resistance among PCOS women was 51.8%; whereas, prevalence of vitamin D deficiency among insulin resistance PCOS women was 97.1%.

Combination of vitamin D with insulin sensitizer like metformin helped in a better way than metformin alone among insulin resistant PCOS women after 8 weeks in regularization of menstrual irregularities, normalization of PCOM on ultrasonography and improving insulin sensitivity (from 3.46 to 2.12).

In our study, HOMA-IR was significantly higher in PCOS patients suggesting that serum vitamin D concentration was negatively associated with insulin resistance in PCOS. The 25-hydroxyvitamin D [25(OH)D] concentrations is an indicator of vitamin D status in the human body, and its deficiency relates to metabolic syndrome, which includes obesity, insulin resistance and glucose intolerance. Our results indicated that women with PCOS had markedly lower 25(OH)D concentrations, consistent with the findings of previous

studies that reported lower vitamin D levels in PCOS patients than in non-PCOS patients.

CONCLUSION

Our study design precluded from assessing effects of supplementation on infertility; longer trial duration may have allowed study of effects of intervention. Future investigations with larger numbers of samples and control groups are also needed to compare the PCOS patients with healthy subjects. Evaluation of the effect of vitamin D deficiency on insulin resistance in women with PCOS was the main purpose of our study; however, further long-term, large, randomized controlled trial, prospective studies are necessary to determine if this supplementation is beneficial to PCOS patients with multiple subgroup analyses may be necessary to remove confounders associated with environment (i.e., sunlight exposure), family history, ethnicity, diet, sexual activity and use of other medications. Vitamin D supplementation should be considered as a safe and easily accessible therapy that is relatively inexpensive in the treatment of patients with PCOS and vitamin D deficiency, but more studies are necessary to assess its effectiveness on associated PCOS symptoms. A further inquiry is whether serum vitamin D level needs monitoring while managing PCOS patients.

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Balloon Dilation Seems Safe, Effective for Sleeve Gastrectomy Stenosis

Endoscopic balloon dilation (EBD) appears to be a safe, minimally invasive alternative to surgical revision for sleeve gastrectomy stenosis (SGS), a systematic review and meta-analysis reveals.

Researchers searched the literature through July 2018 on outcomes of EBD for SGS. The overall EBD success rate was 76%. Success was achieved in 90% of proximal and 70% of distal SGS cases. Obstructive symptoms typically presented weeks to months after laparoscopic SGS. Success rates were 59% for early SGS (within 3 months of the procedure) and 61% for late SGS. The authors concluded that EBD "should be used as first-line therapy for SGS." The findings are reported in *Gastrointestinal Endoscopy*.

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Pancytopenia in Indian Children: A Clinico-hematological Analysis

DEVENDRA MISHRA*, ASHOK KOHLI†, RAJ BALA YADAV‡, SUBHASH CHANDRA*

ABSTRACT

Objective: To determine the etiological profile of pancytopenia in pediatric patients in India. **Material and methods:** Medical records review of a 5-year period between 1st September 1997 and 31st August 2002. Clinical and hematological data of all patients with pancytopenia (hemoglobin [Hb] ≤10 g/dL, TLC ≤4 × 10^9/L, platelet count ≤150 × 10^9/L) at presentation were analyzed. Patients on cytotoxic chemotherapy, those developing pancytopenia during hospital stay, patients referred from other centers with hematological malignancies and neonates were excluded. **Results:** Forty-two children (mean age 8.26 years, range 8.5 months to 13 years, M:F : 1:0.8) were included. Megaloblastic anemia, aplastic anemia and infections were commonest causes, being responsible for 25%, 19.6% and 32.1% of the cases, respectively. Bone marrow aspiration (BMA) was helpful in reaching a definitive diagnosis in 92.8% of those in whom sufficient marrow tissue was retrieved for analysis. Aplastic anemia was the commonest reason for failure of BMA in providing a diagnosis. **Conclusions:** Majority (almost 60%) of the causes of pancytopenia among pediatric patients in this region are easily treatable. There is a need to be aware of such conditions and appropriate investigative modalities should be undertaken for the same.

Keywords: Megaloblastic anemia, aplastic anemia, bone-marrow aspiration

Pancytopenia is the simultaneous presence of anemia (hemoglobin [Hb] less than the normal for age), leukopenia (total leukocyte count [TLC] <4,000 × 10^9/L) and thrombocytopenia (platelet count <150 × 10^9/L). It is a common clinical problem with an extensive differential diagnosis, but there is relatively little discussion of this abnormality in major pediatric and hematology textbooks.[1,2] Although a few authors have discussed it as a separate entity,[3] most of the discussion is centered on aplastic anemia, which is a relatively uncommon cause of pancytopenia in children. The lack of an optimal investigative approach to pancytopenia (especially the role of bone-marrow examination) has also been previously highlighted.[1] A wide variety of disorders can lead to pancytopenia but their relative frequency differs considerably between different age groups and different geographical areas.[1] Also, there have been very few systematic studies of pancytopenia.[1,4] Quite a few studies from India have been published on this topic, but none has addressed this issue in the pediatric age group.[5-8] We, therefore, retrospectively reviewed the medical records of 42 pediatric patients presenting with pancytopenia over a 5-year period, to determine the clinico-hematological characteristics of pancytopenia among pediatric patients in India.

MATERIAL AND METHODS

Pancytopenia was defined as Hb ≤10 g/dL, TLC ≤4,000 × 10^9/L and platelet count ≤150 × 10^9/L. The case-records of all the patients admitted in the Dept. of Pediatrics with an admitting diagnosis of pancytopenia over a 5-year period between 1st September 1997 and 31st August 2002 were reviewed. The records of the Hematology Division, Dept. of Pathology for the same period were also reviewed to identify all cases in which a diagnosis of pancytopenia was made at the time of admission. The details of clinical profile, hematological parameters (Hb, TLC and differential leukocyte count [DLC], platelet count, reticulocyte count, peripheral smear), and bone marrow aspiration (BMA) and/or biopsy examination results were recorded in a structured proforma.

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In the Hematology Division, blood counts are performed on an automated counter and abnormal findings confirmed by a hematopathologist. All peripheral blood films, BMA and/or trephine biopsies were processed as per standard techniques. Other investigations done (cultures of blood, body fluids and bone marrow; splenic aspiration, radiological examination, Mantoux testing, serological tests, etc.) were also recorded.

Children receiving cytotoxic chemotherapy and those developing pancytopenia during the hospital stay were not included. If a patient was admitted more than once, only the first admission record was included for analysis, although the final etiological diagnosis made was recorded. Records of the Neonatal Unit were not included. A total of 47 cases of pancytopenia were thus identified. Full blood counts at admission were available for all of them but counts at discharge and BMA/biopsy results were available for 45 and 42 cases, respectively (as they obtained discharge against advice or absconded prior to BMA).

RESULTS

Complete records of 42 children were analyzed. The mean age of the children was 8.26 years (range, 8.5 months to 13 years; median age, 9 years; mode, 7 years; M:F : 1:0.8). The underlying causes for pancytopenia in these children are tabulated in Table 1.

On statistical analysis, no significant difference was found between the major diagnostic categories (megaloblastic anemia, aplastic anemia and acute lymphoblastic leukemia [ALL]) with regards to sex, age at presentation, presenting complaints and initial hematological values. Megaloblastic anemia was the commonest cause of pancytopenia and responsible for one-fourth of the cases. It was due to folate deficiency in two cases, and vitamin B_{12} deficiency in one case. One patient with megaloblastic anemia passed *Ascaris* worms in stool during hospital stay. All patients with disseminated tuberculosis were over 8 years of age and all patients of kala-azar were residents of endemic areas.

Table 1. Underlying Causes in 42 Children Presenting with Pancytopenia

Diagnosis	Number of patients (%)
Megaloblastic anemia	10 (23.8)
Aplastic anemia	8 (19)
Acute lymphoblastic leukemia	6 (14.3)
Enteric fever	7 (16.6)
Kala-azar	4 (9.5)
Disseminated tuberculosis	4 (9.5)
Others	3*

*One case of non-Hodgkin's lymphoma, one case of disseminated tuberculosis with associated enteric fever. One case was not diagnosed.

Aplastic anemia was responsible for 20% of the cases but no etiologic factors could be implicated in any of these children except three with probable heavy metal poisoning. Two of these were distant cousins working in a battery-manufacturing unit although they presented to the hospital 8-month apart. Another had received indigenous medicines (Unani medicine) for atopic dermatitis with sudden appearance of pallor and petechiae within a month of these medications. No other clinical evidence of heavy metal poisoning was noted in these three children.

BMA had been done in all 42 patients and was inconclusive in 6 patients only. Three of these had aplastic anemia (proved on bone-marrow biopsy) and one had kala-azar (proved on splenic puncture and serology, and responded to sodium antimony gluconate). The remaining two had evidence of disseminated tuberculosis elsewhere in the body but no supportive bone marrow findings; although, one had associated enteric fever. One responded to antitubercular therapy alone, and the other to antitubercular therapy in combination with antibiotics, respectively. Bone marrow biopsy was helpful in making the diagnosis in only 3 patients out of the 6 in whom it was conducted. However, it ruled out underlying aplastic anemia/aleukemic leukemia in the other 3 patients.

Six patients with aplastic anemia and 5 patients with ALL were referred to higher centers for management and 3 patients were lost to follow-up.

DISCUSSION

The results of this study show that pancytopenia can be the presenting feature of a wide variety of illnesses in the pediatric population of our country. Similar to the studies of pancytopenia in adults from India, majority of the patients had megaloblastic anemia, aplastic anemia and hematological malignancies. Although, kala-azar has previously also been reported to present with pancytopenia, disseminated tuberculosis and enteric fever were found to be responsible for a significant number of case (9.5% and 16.6%, respectively).

Megaloblastic anemia was the commonest cause of pancytopenia (23.8%) in this study similar to African reports and adults studies in our country.[1,5,6]

The proportion reported from the West has been much lower (7.5% in adults).[4] Savage et al[1] have reported megaloblastic anemia to be responsible for 35.8% of their 134 hospitalized African pancytopenic patients (age range, 1-73 years; median, 40 years). Among studies in adults in India also megaloblastic anemia is responsible for a significant proportion of pancytopenic patients that varies from 22.3% to 39%.[5-10] Tilak and Jain have however reported a very high proportion of 68% in adult pancytopenic patients.[8]

The cause of megaloblastic anemia could only be determined in 3 of our patients due to the nonavailability of facilities for estimating folic acid and B_{12} at our center. Most studies from India have suffered from this drawback.[5-9] Folic acid and B_{12} are reported to be responsible for similar proportion of pediatric patients with megaloblastic anemia in this region and treatment with a combined preparation of B_{12} and folic acid is an acceptable option.[9]

Although megaloblastic anemia was found to be the commonest cause of pancytopenia among children, a diagnosis of megaloblastic anemia should not be based on the presence of macrocytes on the peripheral smear alone, as this finding is not infrequently found in those with aplastic anemia and also acute leukemia. Similarly, Kumar et al found megaloblastic marrow in 5 patients with falciparum malaria and in 1 patient with enteric fever, who presented with pancytopenia.[5]

Aplastic anemia was the next most common cause (19%) of pancytopenia in this study. Savage et al also reported it to be the second most common cause (26.1%) of pancytopenia in their study. It was responsible for pancytopenia in 62.9% of patients aged below 21 years.[1] Kumar et al; however, found it to be the commonest cause (29.5%) of pancytopenia among adults at a hematology center, which may have been due to high proportion of referred cases at their center.[5] No etiologic factor could be implicated in majority of our cases with aplastic anemia.

Acute leukemia was seen in 6 cases, all of which had ALL. One patient had non-Hodgkin's lymphoma. During the period under review, 4 other patients with pancytopenia and leukemia were seen by us (3 ALL, 1 acute myeloid leukemia [AML]) but were not included for analysis. Eight percent of patients in a Zimbabwean study of adults and children had acute leukemia and these cases were often children.[1]

Hematological findings in kala-azar can include any or all of the findings of anemia, thrombocytopenia, neutropenia and pancytopenia.[10,11] Pancytopenia is caused by hypersplenism, hemolysis, plasma volume expansion, ineffective erythropoiesis and reticuloendothelial hyperplasia. Hemophagocytic syndrome and trilineage myelodysplasia have also been reported as a complication of this illness.[10,12] All the patients with kala-azar in this study came from endemic areas, had history of prolonged fever with a massive splenomegaly, and the diagnosis was clinically suspected prior to bone marrow examination. One patient did not demonstrate Leishman-Donovan (LD) bodies on BMA and had to undergo splenic puncture. Kumar et al reported kala-azar in 4% of their patients; this low frequency could again have been due to the referral nature of their patients.[5]

The two unusual findings observed in this study were the previously unreported high proportion of pancytopenia due to enteric fever and tuberculosis (16.6% and 9.5% of the cases). In patients with tuberculosis, various hematological abnormalities including anemia, lymphocytopenia, thrombocytopenia, leukopenia, pancytopenia, etc. have been described. The commonest of these among Indian patients with disseminated tuberculosis has been reported to be anemia (present in 84%).[13]

In the same study, pancytopenia was found in 19% of the patients with disseminated or miliary tuberculosis. The various postulated mechanisms for pancytopenia include splenic sequestration, immune-mediated bone marrow depression and malnutrition.[13] The presence of a granuloma on bone marrow had no relationship with the occurrence of pancytopenia in previous studies.[13,14] Contrary to these reports; we found granulomas in 3 of the 4 patients with disseminated tuberculosis and pancytopenia. One other case of disseminated tuberculosis had associated enteric fever, thus pancytopenia could not be ascribed to any single condition. There was no granuloma on BMA but the child improved with antitubercular therapy in combination with specific therapy. The suggested conclusive proof of tuberculosis-induced pancytopenia is the resolution of both tuberculosis and pancytopenia with antitubercular therapy.[14]

Another patient had pulmonary tuberculosis with absence of any diagnostic finding on BMA. He was discharged on request prior to bone marrow biopsy and was lost to follow-up. Merely the presence of pulmonary tuberculosis in this child did not justify labeling it as the cause of pancytopenia. In a previous series also, none of the patients with pulmonary tuberculosis had pancytopenia.[10]

As tuberculosis is quite common in our country, it may be coincidentally present in quite a few patients of pancytopenia. Presence of pancytopenia and disseminated tuberculosis in a pediatric patient does not therefore imply causation, and BMA or biopsy should demonstrate granuloma to definitively ascribe pancytopenia to be because of the tubercular infection. Kumar et al reported only 1 patient with disseminated tuberculosis out of 166 adult patients with pancytopenia and diagnosis was made only on a postmortem liver biopsy.[5]

Isolated cytopenias, bicytopenias and pancytopenia in enteric fever are well-documented in literature.[15,16] Multidrug-resistant *Salmonella typhi* (MDRST) are reported to be more commonly associated with hematological findings. Around 84% of the pediatric patients with enteric fever at our center are found to be suffering from MDRST. Bone marrow histiocytic hemophagocytosis has been reported to be a cause for pancytopenia in enteric fever,[16] but was not found in any of our cases. Bone marrow hypocellularity was observed in 3 (43%) of the 7 patients with pancytopenia associated with enteric fever. In others, probably a peripheral mechanism for pancytopenia was operating. None of the children had been receiving chloramphenicol or any other bone marrow depressant. Studies in adults have also reported similar findings.[15]

BMA was extremely helpful in reaching a definitive diagnosis in a majority (92.3%) of those where sufficient marrow tissue was retrieved for analysis. It was inconclusive in only 6 (14.3%) cases; in 3 of which, sufficient marrow tissue was not available by aspiration (all aplastic anemia) and in three others, no diagnostic information could be provided after the examination.

In these 3 also, a primary marrow involvement was ruled out after the marrow examination. Bone marrow biopsy was most helpful in cases of aplastic anemia, where it was diagnostic in all the 4 cases in which it was done (after aspiration was inconclusive). Although BMA has been reported to be inconclusive in up to 38% of adult patients in one series, and simultaneous aspiration and biopsy have been recommended to overcome this problem,[5] we find ourselves unable to concur with this for pediatric patients. Bone marrow biopsy is definitely a more painful procedure than BMA, and subjecting every child with pancytopenia to it does not seem justified in the light of results from this study.

On the other hand, certain authors are of the opinion that BMA is not even needed in certain pancytopenic patients e.g., those with hypersegmented neutrophils on peripheral smear and, those with mild pancytopenia, splenomegaly, an unremarkable blood film and a known cause of portal hypertension.[1] In our opinion, the recommendations of Savage et al[1] seem more appropriate for pediatric patients in our country especially in the setting, where BMA is not feasible. However, at centers where facilities are available, BMA remains a simple test, which not only clears the diagnostic confusion but also rules out the more serious primary marrow involvement like malignancies and aplastic anemia.

This study shows that megaloblastic anemia and infections (kala-azar, enteric fever and tuberculosis), both of which are eminently treatable, cause nearly 60% of the pediatric cases presenting with pancytopenia in this region. This is contrary to the widespread perception of acute leukemia and aplastic anemia as the most common etiologic factors, with their associated poor prognostic implications. It is important to be aware of these conditions as a frequent cause of pancytopenia, so that prompt and appropriate investigative and therapeutic measures can be instituted and a uniformly poor prognosis is not communicated to the relatives.

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FDA Approves First Fish-oil Drug for Cutting Cardiac Risks

US regulators approved expanded use of a fish oil-based drug for preventing serious heart complications in high-risk patients already taking cholesterol-lowering pills. The drug was approved years ago for people with sky-high triglycerides. The FDA allowed its use in a far bigger group of adults with high, but less extreme, triglyceride levels who have multiple risk factors such as heart disease and diabetes. In patient testing, it reduced the risks of potentially deadly complications including heart attacks and strokes by about 25%... (*ET Healthworld*)

Yoga has Benefits During Chemo in Women with Breast Cancer

For women with breast cancer undergoing chemotherapy, participating in weekly yoga sessions can help reduce nausea and sleep problems and improve well-being, according to a randomized pilot study.

Women with stage-I to -III breast cancer scheduled to undergo neoadjuvant or adjuvant chemotherapy were randomly assigned to start yoga immediately (12 weekly 60-minute yoga classes, 22 women) or after 3 months (waitlist control group, 20 women). At 12 weeks, nausea was significantly reduced ($p = 0.014$) and there were trends towards statistical significance in improvement in sleep efficiency ($p = 0.075$) and overall physical well-being ($p = 0.090$) in the yoga group compared with the control group. The research was reported in a poster presented at the San Antonio Breast Cancer Symposium (SABCS).

ARNI for Heart Failure: Earlier is Better

Earlier is better for the initiation of angiotensin receptor-neprilysin inhibition (ARNI) therapy in people hospitalized for acute decompensated heart failure (ADHF), according to data from the open-label extension phase of the 8-week PIONEER-HF trial.

Among patients with heart failure with reduced ejection fraction (HFrEF), those who were assigned sacubitril/valsartan right before discharge saw a further 17.2% decline in N-terminal pro-B-type natriuretic peptide (NT-proBNP) during the 4-week extension, reported Adam DeVore, MD, MHS, of Duke Clinical Research Institute in Durham, North Carolina, and colleagues in *JAMA Cardiology*.

A Role for SGLT2 Inhibition in Gout?

The antidiabetic medication canagliflozin lowered serum urate and reduced the risk of gout flare in a post-hoc analysis of data from two large clinical trials.

In the CANVAS clinical trial program, the percentage difference in serum urate reduction with canagliflozin versus placebo was 6.7% (95% confidence interval [CI] -7.3 to -6.1), according to Bruce Neal, MBChB, PhD, of the University of Sydney in Australia, and colleagues. In addition, the likelihood of a gout flare or the initiation of treatment for gout was halved in patients treated with canagliflozin, with a hazard ratio of 0.53 (95% CI 0.40-0.71, $p < 0.0001$), the researchers reported online in *The Lancet Rheumatology*.

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Comparison of Pulmonary Functions Following Elective Laparoscopic Cholecystectomy and Other Upper Abdominal Surgeries

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ABSTRACT

Objective: To compare the pulmonary functions between the patients operated for laparoscopic cholecystectomy and patients operated for conventional cholecystectomy and other upper abdominal surgeries. **Methods:** This study was a prospective randomized study conducted on 100 patients of ASA Grade I or II of either sex or age group 18-60 years, undergoing various upper abdominal surgeries in the Dept. of Anesthesiology at Grecian Super Speciality Hospital, Mohali. All the patients were divided into two groups of 50 each. Group A patients underwent upper abdominal surgeries by conventional methods, while Group B patients underwent laparoscopic cholecystectomy. All patients were asked to perform the following pulmonary function tests (PFT's) - Breath holding test (BHT), match stick blowing test, tidal volume (Vt), minute volume (MV) and vital capacity (VC) were measured using Wright's respirometer and peak expiratory flow rate (PEFR) measured using mini-Wright peak flow meter. **Results:** Comparing PFT of patients of Group A with Group B, it was observed that values in preoperative period are almost similar indicating that there is not much difference in age, sex and BMI in between two groups. There is 77% decrease in BHT, 71% decrease in TV, 59% in MV, 69% in VC, 73% in PEFR and 83% in MSBT in the immediate postoperative period as compared to preoperative period in Group A. Similar values in Group B were 75%, 66%, 50%, 61%, 63% and 68%, respectively. The 'P' value is significant for all parameters and in both the groups. **Conclusion:** There is a definite decrease in pulmonary functions postoperatively in patients undergoing upper abdominal surgeries in both groups but the decrease is more following conventional surgery patients than following laparoscopic surgery. So cholecystectomy, if possible should be performed by laparoscopic method, particularly in patients with compromised lung function and in economically and socially productive age group.

Keywords: Pulmonary function tests, laparoscopic cholecystectomy, upper abdominal surgery

Pulmonary complications after abdominal surgery play an important role in causing postoperative morbidity and mortality. Upper abdominal surgery, long incisions and tight abdominal binders which cause either intense pain or decrease the respiratory excursion further add to the occurrence of postoperative pulmonary complications.

Cough, sputum production, dyspnea, chest pain, fever and radiographic changes occur in half of such patients, with respiratory failure necessitating mechanical ventilation occurring in 0-21%. The incidence is much higher in patients with existing pulmonary disease. Postoperative deaths were as likely to be due to pulmonary complications as to cardiac complications and patients who sustained a pulmonary complication stayed in the hospital on an average of 12 days longer than those who had either cardiac complication or an uncomplicated course.

Major pulmonary complications mainly include pneumonia, bronchitis, atelectasis, bronchospasm and exacerbation of underlying chronic lung disease. Pulmonary function tests (PFT's) are helpful in defining the type, severity and reversibility of pulmonary pathology. Simple spirometry (volume recorded as a function of time) can provide a very good indication of a patient's respiratory reserves, but requires significant patient cooperation. PFT's are helpful in confirming that a patient with asthma or chronic obstructive pulmonary disease (COPD) is at his/her best baseline. In addition, PFT may be useful in the rare situations where

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dyspnea or exercise intolerance remain unexplained after preoperative clinical evaluation.

Since, the laparoscopic cholecystectomy is progressively becoming more and more popular, it is mandatory to have a conclusive data on the effects of CO_2 pneumoperitoneum on hemodynamic and pulmonary status of these patients during general anesthesia. This encouraged us to take up this research work on changes in pulmonary functions following laparoscopic cholecystectomy in comparison to other upper abdominal surgeries by conventional methods on the patients under general anesthesia.

MATERIAL AND METHODS

A prospective randomized study was conducted in 100 adults, ASA Grade I or II patients undergoing upper abdominal surgeries either by conventional (A) methods or by laparoscopic (B) methods under general anesthesia. The aim was to compare the decrease in pulmonary functions in postoperative period between the two groups and set guidelines for the modification of the anesthetic technique and the ideal monitoring needed to prevent and detect the complications associated with upper abdominal surgeries.

The materials used for this study were as follows:

- Wright's respirometer
- Mini-Wright peak flow meter
- Candle and match box
- Wrist/stop watch
- Noninvasive blood pressure monitor
- Pulse oximeter
- End-tidal CO_2 monitor.

Detailed preoperative evaluation and systemic examination was done as for major surgery. The body weight and height of each patient was recorded. Additional investigations were asked for according to the individual need of the patients. All patients were asked to perform PFT's as follows:

- **Breath holding test (BHT):** In this, patients were asked to take full breath and hold it as long as possible. Patients were instructed to raise his/her hand at the time beyond which it was not possible to hold the breath further. This BHT was noted and recorded in seconds with the help of a wrist watch. Movements of chest were observed to avoid any false reading. Readings >25 seconds were taken as normal while between 15 and 25 seconds as marginal and below 15 seconds were taken as subnormal.
- **Match stick blowing test:** In this test, patients were asked to blow a candle keeping at 15 cm in front of his/her mouth. While blowing, patient should keep his/her mouth open and should not take help of facial muscles and other accessory muscles of respiration. Each patient was given three chances to blow off the candle.
- **How to use peak flow meter:** Mini-Wright peak flow meter is an accurate scientific instrument. It measures peak expiratory flow (PEF), which is the biggest fastest huff one can achieve after taking a deep breath. Patient was asked to take a deep breath and place the mouthpiece end into his/her mouth and make an air-tight seal with his/her lips around the mouthpiece. The patient blowed into the peak flow meter as fast as he/she could. The pointer shot up the slot and remained in a position opposite the scale, which corresponds to PEF. This test was repeated twice more so as to end up with a series of three readings. Only the highest reading of these three was recorded.

How to Use Wright's Respirometer

Tidal volume (Vt), minute volume (MV) and vital capacity (VC) were measured using Wright's respirometer, which is having a clock-shaped meter and a mouthpiece. The patient was asked to breathe in respirometer. After allowing the instrument to record for 1 minute, the MV was read directly and the Vt then calculated from this reading and the respiratory rate. For VC, patient was asked to have full inspiration and then expire fully as long as possible into the respirometer and reading was recorded.

All these above tests were performed in this study at following time: Preoperatively, immediate postoperatively, 6-hour postoperatively, 24-hour postoperatively and 48-hour postoperatively. All the readings were tabulated and then compared. Data were expressed as measuring ± SD. Results were analyzed by student's *t*-test with $p < 0.05$ considered significant.

All patients received balanced general anesthesia with controlled ventilation.

OBSERVATION AND RESULTS

Hemodynamic parameters were in normal range during entire surgery as well as in the postoperative period indicating balanced general anesthetic technique, adequate pain relief and vigilant care of patients at all times. Moreover, respiratory rate was in normal range at all time periods in both groups indicating no respiratory

distress, adequate pain relief and good ventilation of patients. Oxygen saturation remained within normal limits at almost every level in both the groups that's why there was no increase in morbidity and mortality (Tables 1 and 2).

PFT

In Group A, the mean BHT (in sec) preoperatively was 26.26 ± 9.62, immediate postoperatively was 6.0 ± 2.52, 6-hour postoperatively was 10.25 ± 4.97, 24-hour postoperatively was 14.67 ± 6.65 and 48-hour postoperatively was 24.20 ± 6.12. In Group B, the mean BHT (in sec) preoperatively was 26.57 ± 5.36, immediate postoperatively was 6.40 ± 1.82, 6-hour postoperatively was 13.55 ± 4.41, 24-hour postoperatively was 19.77 ± 7.17 and 48-hour postoperatively was 23.00 ± 4.47. 't' and 'p' value was calculated for BHT by comparing their preoperative values with other time periods by paired sample 't' test in both the groups (Table 3).

The mean Vt (in mL) in Group A preoperatively was 411.08 ± 86.03, immediate postoperatively was 118.57 ± 53.67, 6-hour postoperatively was 182.50 ± 87.19, 24-hour postoperatively was 257.50 ± 78.99 and 48-hour postoperatively was 364 ± 45.06. The mean Vt (in mL) in Group B preoperatively was 400.01 ± 80.68, immediate postoperatively was 136.00 ± 43.36, 60-hour postoperatively was 237.73 ± 69.62, 24-hour postoperatively was 316.15 ± 88.37 and 48-hour postoperatively was 353.33 ± 91.36. 't' and 'p' value was calculated for Vt by comparing their preoperative values with other time periods by paired sample '*t*' test in both the groups (Table 4).

The mean VC in Group A (in mL) preoperatively was 2206.67 ± 624.96, immediate postoperatively was 678.57 ± 182.70, 6-hour postoperatively was 935.00 ± 480.56, 24-hour postoperatively was 1434.16 ± 478.72 and 48-hour postoperatively was 1774.00 ± 462.47, whereas in Group B, mean VC (in mL) preoperatively was 2038.57 ± 489.25,

Table 1. Mean Values of Clinical Parameters in Group A

Time/ Parameters	Preoperative	Immediate postoperatively	6-hour postoperatively	24-hour postoperatively	48-hour postoperatively
Pulse (/mt)	82.33	97.04	90.74	86.18	84.64
Range	72-104	82-120	80-108	76-106	74-104
BP (in mmHg)	132.74	136.08	128.56	126.50	128.33
	(83.81)	(86.44)	(79.24)	(76.80)	(77.14)
RR (/mt)	15.16	20.33	17.83	16.66	14.00
Range	12-20	14-24	13-22	12-20	12-17
SaO_2 (%)	96.50	94.76	--	--	--
Range	94-99	93-97			

Table 2. Mean Values of Clinical Parameters in Group B

Time/Test	Preoperative	Immediate postoperatively	6-hour postoperatively	24-hour postoperatively	48-hour postoperatively
Pulse (/mt)	84.60	96.06	87.54	83.60	82.34
Range	70-106	78-116	74-98	72-94	70-94
BP (in mmHg)	124.77	130.06	126.92	122.84	122.16 7
	(82.64)	(84.14)	(80.94)	(78.50)	(6.44)
RR (/mt)	14.66	18.74	16.64	15.91	14.04
Range	12-22	14-24	12-20	12-18	12-16
SaO_2 (%)	97.50	96.04	--	--	--
Range	95-99	94-98			

Table 3. Comparison of BHT (in Sec) Between Two Groups

Variable	Group A					Group B				
	T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
Mean	26.25	6.0	10.25	14.67	24.20	24.57	6.40	13.55	19.77	23.00
SD	9.62	2.52	4.97	6.65	6.12	5.36	1.82	4.41	7.17	4.47
SE	2.78	0.95	1.44	1.94	2.87	1.43	0.81	1.33	1.99	0.81
P value		<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.021
		HS	HS	HS	HS		HS	HS	S	S
't' value		-5.692	-7.867	-6.630	-6.086		-7.625	-11.431	-4.54	-6.08

Table 4. Comparison of Vt (in mL) Between Two Groups

Variable	Group A					Group B				
	T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
Mean	411.0	118.57	182.50	257.50	364.00	400.0	136.00	237.73	316.1	353.3
SD	86.03	53.67	87.19	78.99	45.06	80.68	43.36	69.62	88.37	91.36
SE	24.84	20.29	25.17	22.80	20.15	21.56	19.39	20.99	24.51	37.30
P value		<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	0.036	0.289
		HS	HS	HS	HS		HS	HS	S	NS
't' value		-23.229	-11.954	-7.885	-7.188		-9.467	-10.008	-5.45	-1.18

immediate postoperatively was 776.00 ± 109.45, 6-hour postoperatively was 1140.00 ± 424.50, 24-hour postoperatively was 1507.69 ± 436.52 and 48-hour postoperatively was 1783.33 ± 476.79. The 'p' and 't' value was calculated for VC by comparing their preoperative value with other time periods by paired sample 't' test in both the groups (Table 5).

In Group A, the mean peak expiratory flow rate (PEFR, in Lit/mt) preoperatively was 342.92 ± 102.75, immediate postoperatively was 91.42 ± 25.45, 6-hour postoperatively was 132.08 ± 54.83, 24-hour postoperatively was 208.33 ± 76.73 and 48-hour postoperatively was 278.00 ± 73.96, whereas in Group B, the mean PEFR (in Lit/min) preoperatively was 319.29 ± 72.05, immediate postoperatively was 243.08 ± 66.00 and 48-hour postoperatively was 286.67 ± 30.11. 'P' and 't' value calculated similarly as for other parameters of pulmonary functions (Table 6).

DISCUSSION

Upper abdominal surgeries account for significant proportion of surgical load in our routine surgical practice. Therefore, when laparoscopic surgeries arrived on the scene, as an alternative to conventional surgery, it was hailed as the panacea for the patients undergoing upper abdominal surgeries.

Long incisions in conventional upper abdominal surgery and tight abdominal binders may result in intense pain or decreased excursion of chest leading to reduction in lung volumes. This reduction in lung volumes in restrictive pattern contributes to the development of atelectasis, which further leads to other postoperative pulmonary complications.

The parameters used to compare pulmonary functions were simple basic measures indicating both static and dynamic tests of ventilation and can be performed easily by the bedside of the patient. These simple, primitive measures were studied taking into account the progressively increasing trend of laparoscopic surgeries and reaching far off areas where other sophisticated measures for pulmonary functions were not available.

There was significant decrease in the pulmonary functions in immediate postoperative period in both

Table 5. Comparison of VC (in mL) Between Two Groups

Variable	Group A					Group B				
	T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
Mean	2206	678.5	935.0	1434	1774	2038	776.0	1140	1507	1783
SD	624	182.7	480.5	478.7	462.4	489	109.4	424.5	436.5	476.7
SE	180	69.06	138.7	137.1	206.8	130	48.95	127.9	127.9	194.6
P value		<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	0.002	0.035
		HS	HS	HS	HS		HS	HS	S	S
't' value		-11.42	-13.26	-7.236	-4.739		-5.116	-6.196	-4.97	-7.58

Table 6. Comparison of PEFR (in Lit/mt) Between Two Groups

Variable	Group A					Group B				
	T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
Mean	342	91.42	132.08	208.33	278.0	319	116.0	176.82	243.1	286.7
SD	102	25.45	54.83	76.73	73.96	72.1	64.27	71.56	66.00	30.11
SE	29.6	9.62	15.83	22.15	33.08	19.2	28.74	21.58	18.31	12.23
P value		<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	0.024	0.043
		HS	HS	HS	HS		HS	HS	S	S
't' value		-7.452	-11.04	-6.536	-4.07		-6.550	-5.754	-5.35	-2.69

groups. There was 77% decrease in BHT, 71% decrease in Vt, 59% decrease in MV, 69% decrease in VC, 73% decrease in PEER in Group A patients in the immediate postoperative period when compared with preoperative values. Similar values in Group B were 75%, 66%, 50%, 61%, 63%, respectively. This decrease may be due to long upper abdominal incision and hence more pain, tight abdominal strapping, impairment of diaphragmatic contractility leading to decreased excursion of chest, thereby decreasing lung volumes. On comparing preoperative values of PFTs with the postoperative ones by paired sample 't' test, it was found that all values were significant in Group A, while in Group B, Vt and MV values at 48-hour interval were not significant indicating earlier recovery of lung functions in Group B. So, the decrease in pulmonary functions is more in patients of Group A as compared to patients of Group B. Pain following laparoscopic surgery consists of an early transient vague abdominal and shoulder discomfort due to peritoneal irritation caused by the residual CO_2. Pain from puncture wounds is generally mild because the wounds are small. Although, the creation of pneumoperitoneum during laparoscopic surgery leads to diminished excursion of diaphragm, increased pressure on lower lobes results in hypoventilation of lower lobes but probably these factors hamper lung functions less than in patients operated conventionally. Further factors like pneumoperitoneum leading to elevation of diaphragm were deleted in the postoperative period.

CONCLUSION

Hence, it is concluded that the mechanical and pain factors involved in conventional surgery have more depressant effects on pulmonary functions than pneumoperitonium during laparoscopic surgery. Patients with restricted lung function should be brought to optimum level by controlling infection with antibiotics, relieving spasm with bronchodilators and by chest physiotherapy. Postoperative pain relief should be adequate, but it should not interfere with respiration. So cholecystectomy, if possible should

be performed by laparoscopic method, particularly in patients with compromised lung function and in economically and socially productive age group.

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Immunosuppressive Effects of Cancer Treatment Increase Mortality in People with HIV

Adults with HIV whose cancers are treated with chemotherapy or radiotherapy experience significant reductions in CD4 count, which are linked to increased mortality, compared with those who have surgery or other treatment, according to findings from an observational study.

Investigators compared longitudinal changes in CD4 count and HIV RNA level by cancer treatment type in 196 adults living with HIV and also quantified the association between these biomarkers and all-cause mortality after cancer treatment. Among the 60.2% of patients who received chemotherapy and/or radiotherapy, the median 5-year mortality risk was significantly higher (37%) than that among the remaining patients who had surgery or other treatment (24%), the researchers report in *JAMA Oncology*.

There have been At Least 1,300 Flu Deaths in the US So Far This Season, CDC Estimates

At least 1,300 people have died from the flu so far this season, according to a preliminary estimate released by the US CDC. There have been at least 2.6 million flu illnesses and 23,000 flu-related hospitalizations, according to the analysis. So far this season, the CDC has received reports of 10 children who have died from the flu, four more than the week before… (*CNN*)

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Mosaic Variant of Turner Syndrome

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ABSTRACT

Turner syndrome is the most common chromosomal abnormality leading to gonadal failure and primary amenorrhea. While half of the cases have monosomy of chromosome X, the remaining exhibit mosaicism resulting in wide variation of phenotypic characteristics and clinical manifestations. We present a case of a 24-year-old female with mosaic variant Turner syndrome. The diagnosis was confirmed by karyotype analysis and laparoscopy.

Keywords: Turner syndrome, amenorrhea, karyotype analysis, laparoscopy

Turner syndrome is a genetic disorder that is characterized by complete or partial loss of one of the two X chromosomes in a phenotypic female. It was first described by Henry Turner in 1938. There is a wide variability of phenotypic features in a Turner syndrome patient due to the partial or complete monosomy of chromosome X, which is a result of chromosomal nondysjunction. Despite the variability, amenorrhea due to ovarian insufficiency and short stature is common to most of them. The phenotypic features exhibited by the non-mosaic 45,XO patient include short stature, webbed neck, shield chest, cubitus valgus, low hairline, short fourth metatarsal, etc. Apart from these, cardiac abnormalities like coarctation of aorta, renal abnormalities, ophthalmologic problems, sensorineural hearing loss and thyroid abnormalities are relatively common in them. In the mosaic variant of Turner syndrome, clinical manifestations may present to varying degree and sometimes the classical phenotypic features may be absent.

We present a case of mosaic variant Turner syndrome with primary amenorrhea due to ovarian insufficiency but no classical phenotypic characteristics.

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CASE REPORT

A 24-year-old female presented to the Gynecology OPD of Rajindra Hospital, Patiala with the chief complaint of failure to menstruate (primary amenorrhea). Patient explained that she was apparently well till 16 years of age when she went for gynecological consultation along with her mother for primary amenorrhea. According to her mother, they were told that the patient did not have a uterus as seen on ultrasound and were asked to consult a Gynecologist when the patient wanted to get married. So, the patient reported to Rajindra Hospital at 24 years of age with primary amenorrhea and absence of secondary sexual characters. The patient had no history of cyanosis, recurrent respiratory tract infection, cardiological problem or developmental delay. The patient had no other significant medical or surgical past history. There was no similar complaint in the family.

Suspecting Turner syndrome as the most likely cause of primary amenorrhea and absence of secondary sexual characters, we pursued our examination. On examination, patient had normal intelligence (she was a graduate). Her height and weight were 149 cm (4 feet 9 inch) and 36 kg, respectively. There was no low hair line, no low set ears, no webbed neck, no shielded chest, no cubitus valgus or genu valgum and no abnormality of nails or fingers. No abnormality was detected on thyroid gland palpation. The Tanner staging of breast was Stage 2 (breast buds present) (Fig. 1), while that for pubic hair was Stage 1 (sparse pubic hairs were present). Axillary hair were scanty. On auscultation, first and second heart sounds were normally heard and no murmur was audible. Abdomen on palpation was nontender and on local examination, urethral and vaginal openings were present. Labia

majora and minora were not well developed. Based on the examination, a provisional diagnosis of primary amenorrhea was made and further investigation and examination under anesthesia were planned.

Investigations were as under:

- Complete blood count (CBC) – Hemoglobin-11.7 g/dL, WBC-9,200/μL, platelet-4,15,000/μL, HCT-35.9%, MCV-75.6 fL, MCH-24.6 pg, MCHC-32.6 g/dL.
- Liver function test (LFT) – Total bilirubin-0.56 mg/dL, direct bilirubin-0.12 mg/dL, indirect bilirubin-0.44 mg/dL, serum glutamic oxaloacetic transaminase (SGOT)-39 IU/L, serum glutamic pyruvic transaminase (SGPT)-28 IU/L, serum alkaline phosphatase-67 IU/L.
- Renal function test (RFT) – Blood urea-18 mg%, serum creatinine-0.7 mg%.
- Fasting blood sugar (FBS) – 84 mg%.
- Thyroid profile – T3-1.53 ng/mL, T4-9.7 μg/dL and TSH-3.56 μIU/mL (normal).
- Luteinizing hormone (LH) – 12.6 mIU/mL.
- Serum prolactin (7.18 ng/mL) was normal.
- Follicle-stimulating hormone (FSH) (63.16 mIU/mL) was markedly elevated.
- Speech audiometry revealed normal hearing on right side and mild hearing loss on left side – 21.6 dB and 38.3 dB, respectively.
- Radiological investigations were carried out to determine the condition of the reproductive organs and any other organ involvement:
  - Ultrasound revealed that both the ovaries were present but the uterus was severely hypoplastic.
  - Magnetic resonance imaging (MRI) further confirmed the uterus to be markedly small in size, 3 × 6 cm. Endometrium was thin-lined. Ovaries were normally visualized and no other pelvic/adnexal mass or free fluid in the pelvis was seen.
  - Ultrasound of whole abdomen showed no other organ abnormality.
- Echocardiography was normal.
- Chest X-ray revealed no abnormality.
- She was subjected to karyotyping which revealed two cell lines, that is, first cell line (25 cells examined) showed 45,XO (Fig. 2) while the second cell line (5 cells examined) showed 46,XX (Fig. 3).

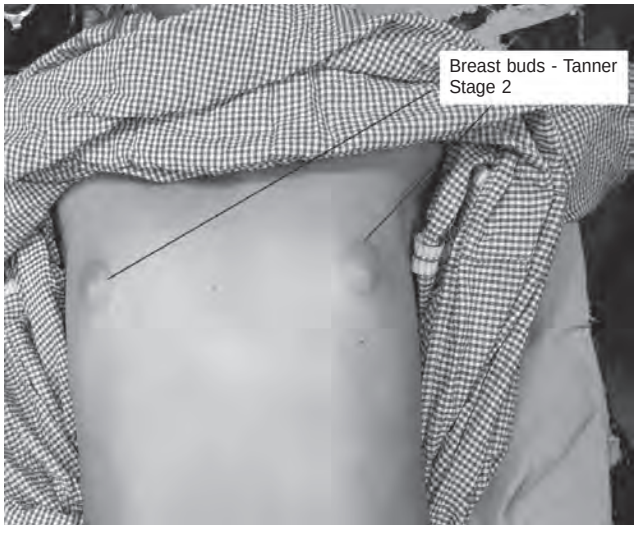

Figure 1. Breast buds - Tanner Stage 2.

This mosaic chromosome complement was consistent with the diagnosis of variant Turner syndrome.

Examination under anesthesia along with diagnostic laparoscopy was performed.

Per speculum examination showed a small-sized cervix with both anterior and posterior lips (Fig. 4).

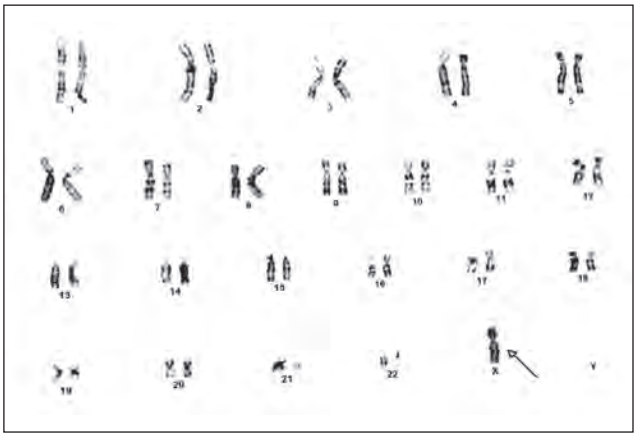

Figure 2. Karyotyping - 45,XO (25).

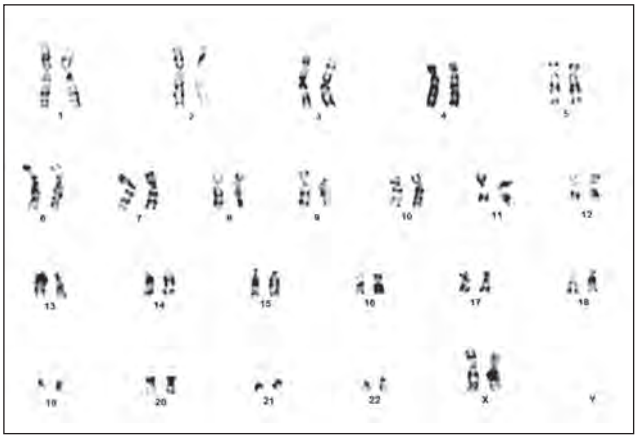

Figure 3. Karyotyping - 46,XX (5).

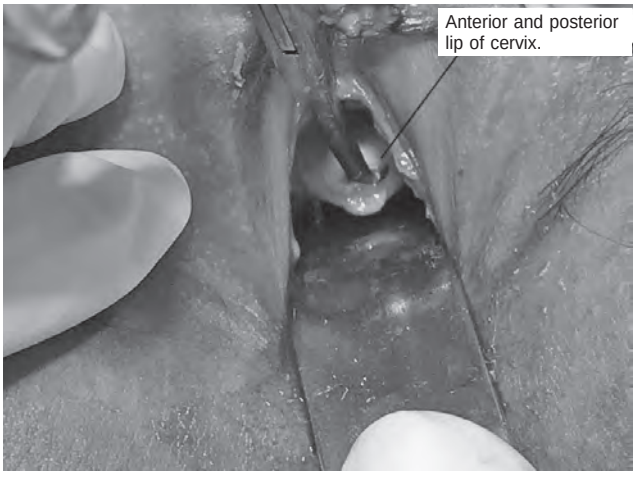

Figure 4. Per speculum examination - Note small size cervix with both anterior and posterior lips.

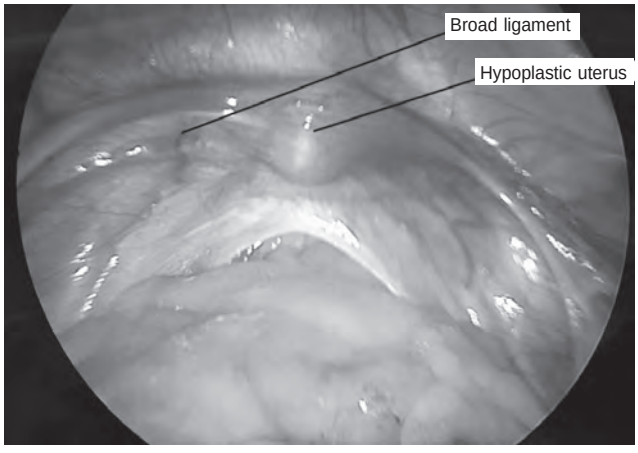

Figure 5. Diagnostic laparoscopy - Note hypoplastic uterus with broad ligaments.

Per vaginal examination – vagina admitted one finger and was 9 cm in length. Dimpling of external os was felt.

Uterine sound went inside the cervix up to 3 cm. Laparoscopy performed revealed small 3 × 2 cm sized mass at the site of uterus which was suspected to be the uterine body (Fig. 5). Uterosacral ligaments were appreciated. Fallopian tubes and ovaries could not be appreciated.

Based on the karyotype analysis and diagnostic laparoscopy, final diagnosis of mosaic Turner syndrome with gonadal dysgenesis was made.

The patient and her parents were counseled about this condition and the patient was discharged on hormonal therapy, vitamin D and calcium supplementation and the advice to undergo screening tests including echocardiography, audiometry, thyroid function test, LFT, RFT, lipid profile and complete hemogram on regular basis.

Patient is coming for regular follow-up. She is married now with normal sexual life.

DISCUSSION

Turner syndrome is one of the most common sex chromosome abnormality among the females. It affects 1 in 2,000 live born females. About 99% of Turner syndrome patients are spontaneously aborted, usually in the first trimester. More than 50% of the females with Turner syndrome have 45,XO or the non-mosaic karyotype. Many other karyotype variations including short or long arm deletion, ring X, isochromosome of long arm and mosaicism (cell lines of 45,XO and 46,XX) are also present. Short stature and gonadal insufficiency are the two clinical manifestations which are present in most of the cases irrespective of whether they are non-mosaic or mosaic variant of Turner syndrome.

Short stature is the most common reason for consultation to the doctor in the case of Turner syndrome, especially mosaic variants. The growth failure in this condition usually causes the adult female height to be about 20 cm below the average adult height of the female of that country and the average adult female height of our country is 152 cm. In our case, the patient's height was 149 cm, indicating that this phenotypic feature was not completely affected due to mosaicism which is different from the majority of the cases which have short stature.

The other phenotypic features consistent for Turner syndrome including webbed neck, low hair line, short fourth metatarsal, cubitus valgus, peripheral edema, etc., may be absent in the mosaic variant making it difficult to diagnose clinically. The other conditions like renal abnormalities (horseshoe-shaped kidney), cardiovascular abnormalities (coarctation of aorta), sensorineural hearing loss and thyroid abnormalities which are present in most of the non-mosaic patients may be absent in the mosaic variant. In our patient, none of these conditions was present.

Apart from these clinical features, gonadal insufficiency is usually present in most of the patients with Turner syndrome. It is due to early degeneration of the oocytes so that at birth only few oocytes are present and the ovaries look like fibrotic streaks. This gonadal failure is determined by raised FSH, ultrasound or diagnostic laparoscopy. In our patient, FSH was elevated and ovaries were not appreciated at all on diagnostic laparoscopy. Also, due to lack of estrogen production, secondary sexual characters like breast development, pubic hair growth, etc., do not develop.

Despite the fact that gonadal insufficiency is common in both mosaic and non-mosaic variants, some studies do indicate that normal puberty and spontaneous menarche occur more commonly in living mosaic variants (including those with some cell lines having 45,XO while others having 46,XX or 47,XXX or 46,XiXp) as compared to the non-mosaic (42-70% and 10%, respectively). Although these mosaic variants do conceive but there is increased risk of spontaneous abortions, stillbirths and congenital abnormalities.

A number of complications can develop in these patients as they grow old, including hypertension, cardiac complications (especially aortic root dissection), thyroid abnormalities, sensorineural hearing loss, increased risk of fractures due to osteoporosis and liver cirrhosis. Although these conditions are relatively more common and serious in the non-mosaic variant but all the Turner syndrome patients should be screened periodically for these conditions for timely diagnosis and thus decrease the morbidity and mortality associated with it. Apart from this, patients are given psychological supportand hormone therapy staring from adolescence and continuing till 50-60 years after which continuation of therapy depends on risk factors for developing complications like deep-vein thrombosis, cardiovascular complications, etc. So, a multidisciplinary team should carry out the management of girls with Turner syndrome right from diagnosis to adulthood.

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New Data on Menopausal Hormone Therapy

Two different types of menopausal hormone therapy — estrogen alone and estrogen *plus* progestin — have opposite effects on breast cancer incidence that persist long after stopping treatment, according to over 19 years of follow-up of the landmark Women's Health Initiative (WHI).

The data indicate that use of conjugated equine estrogens (CEE) alone significantly decreases breast cancer incidence and deaths from breast cancer, while CEE *plus* medroxyprogesterone acetate (MPA) significantly increases the risk of developing the disease.

In both instances, these effects linger for decades after discontinuation. The findings were presented at a press briefing at the San Antonio Breast Cancer Symposium (SABCS) 2019.

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Cocktail Inferno – Multiple Sclerosis with Type 2 Diabetes Mellitus in a Patient with Lepromatous Leprosy

SONIA JAIN*, PRIYANKA DATE†, NEERAJ DODKE‡

ABSTRACT

Co-occurrence of multiple sclerosis with type 2 diabetes mellitus with lepromatous leprosy is rare. We hereby report a case of multiple sclerosis with type 2 diabetes mellitus with lepromatous leprosy in a middle-aged female. She was clinically diagnosed as having multiple sclerosis with type 2 diabetes mellitus and presented with fever, ENL and neuritis. Her MRI reports were normal but she had a positive slit-skin smear and skin biopsy as lepromatous leprosy. Proceeding with this diagnosis, she was treated with baclofen for spastic bladder, antibiotics for urinary tract infection, oral hypoglycemic agents and oral steroids with multibacillary treatment for leprosy with type 2 reactions. She responded well and currently is being followed-up.

Keywords: Multiple sclerosis, leprosy, diabetes mellitus, demyelinating neuropathy

Multiple sclerosis is a disorder with heterogeneous clinical and pathologic features reflecting various pathways to tissue injury.[1] Inflammation, demyelination and axonal degeneration are the key pathologic mechanisms, which lead to clinical manifestations.[2,3] However, the cause of multiple sclerosis remains unknown.[4,5] The most widely accepted theory suggests that it begins as an inflammatory immune-mediated disorder characterized by autoreactive lymphocytes.[1,6] Later, the disease is dominated by microglial activation and chronic neurodegeneration.[2]

Leprosy (Hansen's disease) is an infectious disease caused by *Mycobacterium leprae* that involves the skin and peripheral nerves. Early diagnosis and a full course of treatment are critical for preventing lifelong neuropathy and disability.[7] Although the infection is highly responsive to treatment, leprosy became an important global health concern due to deformities and disabilities of the eyes, hands and feet secondary to neuropathy which are often irreversible and require lifelong care and rehabilitation. Therefore, early diagnosis and management are necessary to minimize the likelihood of these disabilities.[8]

Type 2 diabetes mellitus is characterized by hyperglycemia, insulin resistance and relative impairment in insulin secretion. It is a common disorder with a prevalence that rises markedly with increasing degrees of obesity.[9]

The prevalence of type 2 diabetes has risen alarmingly in the past decade,[10] in large part linked to the trends in obesity and sedentary lifestyle.[11]

CASE REPORT

A 55-year-old female was brought by her relatives to the skin department. She had flexor spasms, difficulty in walking, spastic bladder with an indwelling catheter since last 4 years and was diagnosed to have multiple sclerosis. She had multiple admissions for fever and urinary tract infection and was on oral hypoglycemic agents on regular basis. She presented with fever, multiple red-colored raised lesions (Erythema nodosum leprosum or ENL) all over the body (Fig. 1), with weakness, tingling and numbness over both upper and lower limbs. ENL were also present over her face

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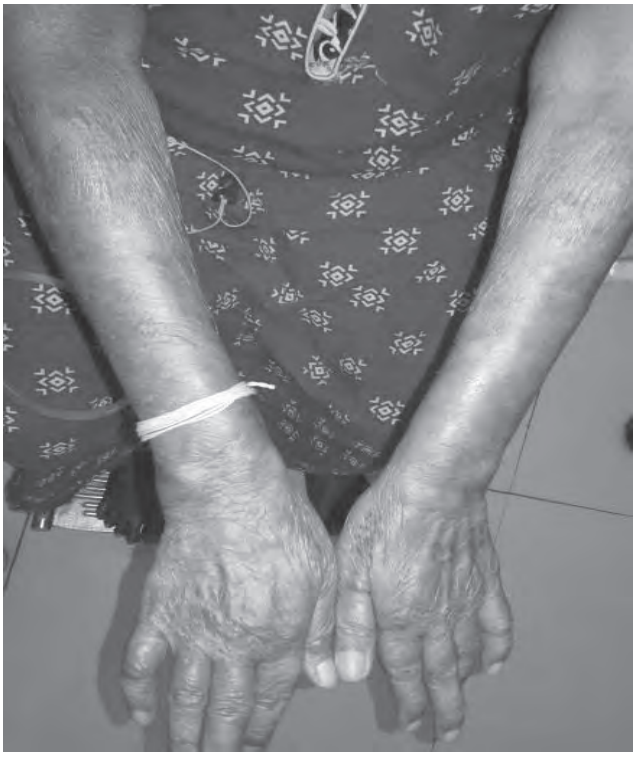

Figure 1. Multiple red-colored raised lesions (ENL) over body.

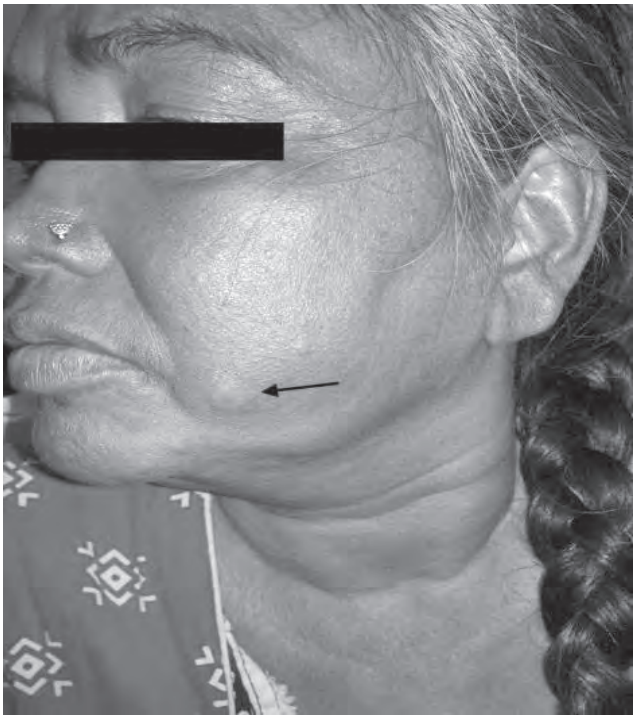

Figure 2. ENL present over face adjacent to angle of mouth (*arrow*).

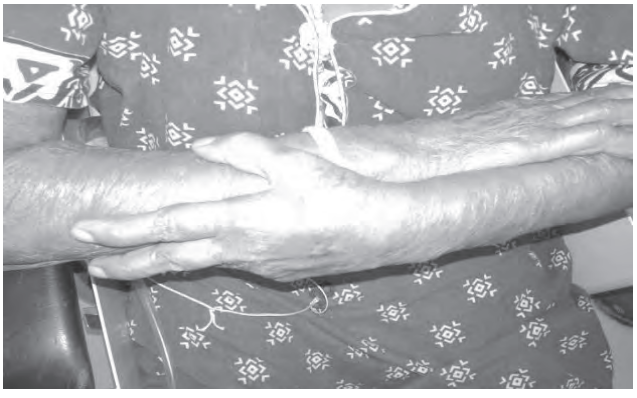

Figure 3. Xerosis and icthyosis visible over bilateral upper limbs.

adjacent to the angle of mouth (Fig. 2). Xerosis and ichthyosis characteristic of leprosy was visible over bilateral upper limbs (Fig. 3). There was no history of photosensitivity or any drug intake or application of any local irritant prior to the initial lesion.

Her detailed central nervous system evaluation revealed upper motor neuron type of paraparesis, sensorimotor with proximal as well as distal muscle involvement with urge incontinence suggestive of spastic type of neurogenic bladder. Her mental functions were intact with no cranial nerve involvement. Cardiovascular system, respiratory system and per abdominal evaluation was within normal limits.

Her routine blood biochemistry was normal except for low hemoglobin levels (5.9%), raised white blood cell (WBC) counts (15,800) and raised random blood sugar (RBS) levels (157 mg/dL). Urine analysis revealed urinary tract infection for which she was treated with antibiotics. Bladder care was given. She was treated with baclofen. Skin examination revealed positive slit-skin smear for acid-fast bacilli with bacteriological index of 3.5 and skin biopsy consistent with lepromatous leprosy. She was put on oral steroids for type 2 lepra reaction and multibacillary anti-leprosy treatment for leprosy. Appropriate oral hypoglycemic agents were continued as she was reluctant with insulin administration. Brain imaging was normal. She responded well and her flexor spasms decreased. A psychiatric consultation was sought for her depression due to chronic illness and was started on antidepressants.

DISCUSSION

Dominant or recessive genetic mutations give rise to a number of inherited neuropathies. The basic pathology happens to be in the Schwann cells, the myelinating unit of the neuron leading to defective myelination, alteration of the axonal cytoskeleton and disruption of the axonal transport.[12] Genes involved in the axonal transport are the chief site of mutation in the majority

of inherited neuropathies leading to the atrophy of the axons and directly correlate with the clinical features in the inherited neuropathies.[12]

Diabetes mellitus is characterized by a number of sensorimotor and mixed neuropathies. The pathologic hallmark of neuropathies occurring in long-term diabetics involves the advanced glycation end products, persistent oxidative stress, polyol pathway flux and protein kinase C activation, ultimately contributing to microvascular disease and nerve dysfunction.[13]

Common symptoms of multiple sclerosis include sensory abnormalities including pain, motor symptoms due to involvement of the pyramidal tracts, visual disturbances, ataxia and Lhermitte sign. The pattern of abnormalities can vary from subtle limb weakness or sensory symptoms like Uhthoff phenomenon to more severe sensorimotor noncompressive myelopathies like acute transverse myelitis. Retrobulbar neuritis and optic neuritis have been the common causes of transient visual disturbances in multiple sclerosis. The onset is often polysymptomatic. Neuropathy is an early feature in Hansen's disease, as earliest diagnostic lesions are characterized by hypoesthesia.[14] Though early sensory loss is a common finding in leprosy, in some cases, patients can present with pain, which is often late in the course of the disease.[15,16]

In the tuberculoid spectrum of the Ridley-Jopling classification, neuropathy occurs in the proximity of the skin lesions, as against neuropathy in lepromatous disease, which is more generalized. Common nerves include the ulnar, median nerves (claw hand), the common peroneal nerve (foot drop), the posterior tibial nerve (claw toes and plantar insensitivity), the facial nerve (lagophthalmos), the radial cutaneous nerve, and the great auricular nerve. Subclinical neuropathy is found more commonly, as against it was previously believed in leprosy.

These results may have implications for the design of ErbB2 RTK-based therapies for both leprosy nerve damage and other demyelinating neurodegenerative diseases.[17]

Here we report this case as to the best of our knowledge, leprosy with multiple sclerosis has not been reported in literature.

CONCLUSION

Multiple sclerosis, Hansen's disease and diabetes mellitus are multisystem diseases with distinct etiologies affecting the sensory as well as motor nerve fibers. It is considerably rare to find a demyelinating, infectious and autoimmune disease of the nerves to co-exist in the same patient. All these conditions can be managed simultaneously and successfully.

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Indian Journal of Clinical Practice, Vol. 30, No. 8, January 2020

Amegakaryocytic Thrombocytopenia with Rheumatoid Arthritis

KALPANA CHANDRA*, PRAVEEN KUMAR†, SHUCHISMITA‡, REECHA SINGH#, NARESH KUMAR$, SUDHIR KUMAR†

ABSTRACT

Background: Amegakaryocytic thrombocytopenia is characterized by low platelet count in the periphery with a concurrent marked decrease or complete absence of megakaryocytes in the bone marrow. We present a case of amegakaryocytic thrombocytopenia with rheumatoid arthritis. **Case report:** A 52-year-old female was admitted with the chief complaints of weakness and vomiting for 3-4 days. There was history of joints pain and early morning stiffness for 6 months. On examination, she had signs of arthritis involving small joints such as wrist, MCP, ankle and MTP in symmetrical fashion. Her investigations revealed Hb - 6.2 mg/dL, TLC - 2,800/mm^3, DLC - $N_{40}L_{50}M_3E_1$. Platelet count was 10,000/mm^3. Her anti-CCP was >200 U/mL. Her bone marrow aspiration showed normocellular to mildly hypocellular marrow, mild suppression of myeloid and megakaryocytic series with an advice for bone marrow biopsy. Symptomatic and supportive treatment with steroid was started. Her platelet count improved gradually and on the day of discharge, she had platelet count 54,000/mm^3. She returned back to emergency department after 1 week with purpuric rashes all over the body. By this time, bone marrow biopsy report was available which showed normocellular marrow with megakaryocytic aplasia. With these clinical findings, lab investigation including bone marrow finding and therapeutic trial of steroid without any response, a final diagnosis of amegakaryoctyic thrombocytopenic aplasia with rheumatoid arthritis was rendered. **Conclusion:** Patient presenting with unexplained thrombocytopenia not responding to corticosteroid needs further evaluation with bone marrow aspiration and biopsy to establish the diagnosis of acquired amegakaryocytic thrombocytopenic aplasia as this entity is rare and requires focused management and monitoring.

Keywords: Amegakaryocytic thrombocytopenia, thrombocytopenia, rheumatoid arthritis

Thrombocytopenia is defined as platelet count below 1 lakh. It results from failure of bone marrow to produce megakaryocytes or from increased destruction, utilization or sequestration of platelets at periphery. The failure to produce platelet is either from the congenital or acquired decrease in megakaryocytes. Acquired amegakaryocytic thrombocytopenia (AATP) is characterized by low platelet count in the periphery with a concurrent marked decrease or complete absence of megakaryocytes in the bone marrow. The exact etiology and pathogenesis responsible for causing this rare entity is unknown.[1] It is believed that autoimmune mechanisms play an important role and immunosuppressive drugs are the treatment of choice in majority of patients. These patients are generally refractory to steroids and intravenous immunoglobulin treatment. AATP is essential to diagnose as this condition has variable clinical course and may rapidly progress to aplastic anemia or myelodysplastic syndrome.[2]

We present a case of amegakaryocytic thrombocytopenia with rheumatoid arthritis.

CASE REPORT

A 52-year-old female was admitted in General Medicine Department with the chief complaints of weakness and vomiting for 3-4 days. There was history of joints pain and early morning stiffness for 6 months. She had no recent complaints of fever or intake of any drug or trauma. There was no significant family history. Her pulse was 90/min and blood pressure

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was 110/80 mmHg. Musculoskeletal examination revealed signs of arthritis involving small joints such as wrist, metacarpophalangeal (MCP), ankle and metatarsophalangeal (MTP) in symmetrical fashion. Other systemic examinations were nondiagnostic. Her investigation revealed hemoglobin - 6.2 mg/dL, total leukocyte count (TLC) - 2,800/mm^3, differential leukocyte count (DLC) - $N_{40}L_{50}M_3E_1$. Platelet count was 10,000/mm^3. The hematological indices showed mean corpuscular volume (MCV) - 93.3 fl, mean corpuscular hemoglobin (MCH) - 32.4 pg, mean corpuscular hemoglobin concentration (MCHC) - 30 g/dL.

Her peripheral blood smear showed:

- Red blood cell (RBC) - Reduced and widely spaced, predominantly normocytic normochromic, mild anisocytosis.
- White blood cell (WBC) - Leukopenia with neutropenia.
- Platelet - Markedly reduced with normal morphology. No giant platelets or clumps of platelets seen.
- No hemoparasites seen. No atypical cells seen.

Erythrocyte sedimentation rate (ESR) was 110 mm in 1st hour and serum vitamin B_{12} was >2,000 pg/mL. Serum lactate dehydrogenase and serum uric acid were within normal range. HbsAg, anti-HCV and Anti-HIV were nonreactive. Direct and indirect Coombs tests were negative. Prothrombin time, partial thromboplastin time, liver function test, renal function test, serum iron and serum transferrin saturation were within normal range. ANA was negative but her anti-CCP was >200 U/mL. Bone marrow aspiration was done and the final impression was - Normocellular to mildly hypocellular marrow with mild suppression of myeloid and megakaryocytic series. She was also advised for bone marrow biopsy. She was given symptomatic and supportive care along with steroid. Her platelet count improved gradually and on the day of discharge, she had platelet count 54,000/mm^3. She returned back to Medicine Emergency Department after a week with the complaints of weakness and purpuric rashes all over the body.

Now bone marrow biopsy report was available, which showed normocellular marrow with megakaryocytic aplasia. No granuloma or foreign cell infiltrates were seen (Figs. 1 and 2).

With this clinical finding, lab investigation including bone marrow finding and therapeutic trial of steroid without any response, a final diagnosis of amegakaryoctyic thrombocytopenic aplasia with rheumatoid arthritis was rendered. We don't have facility to test for TPO and c-MpI antibodies at our center. So with this diagnosis, the patient was referred to a higher centre to a hematologist.

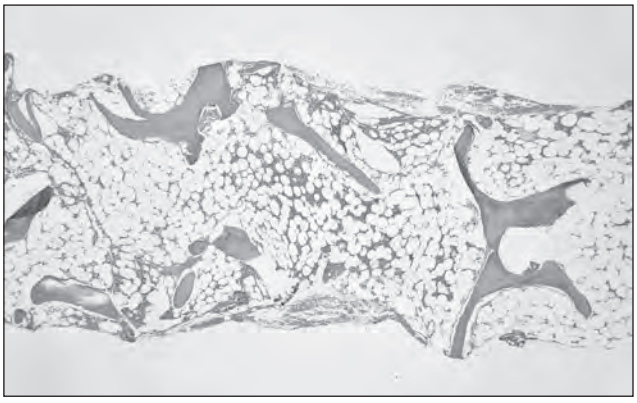

Figure 1. Bone marrow biopsy showing normal cellularity with no identifiable megakaryocytes (H&E 10X).

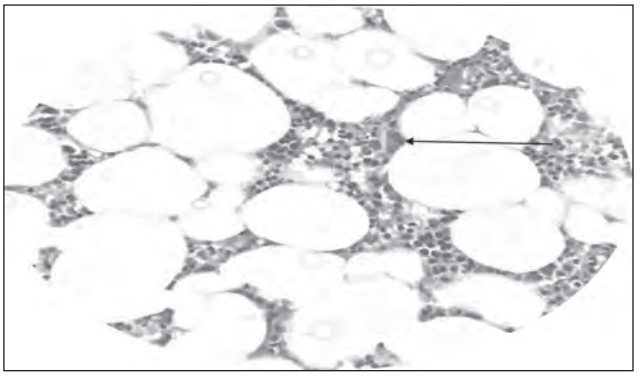

Figure 2. On high power, one megakaryocyte is appreciable (H&E 40X).

DISCUSSION

AATP is a rare hematological disorder with equal incidence in males and females. Usually, the females present in the age range of 40-60 years. The exact prevalence of amegakaryocytic thrombocytopenia is not well documented and it is believed that the incidence rate is higher than reported due to misdiagnosis or underdiagnosis.[3] The definite pathogenesis causing this disease is still unclear. It has been found that either it is idiopathic or associated with various pathological entities, which include viral infections, cytogenetic abnormality, drug sensitivity, immune mediated and malignancy.[4,5]

Cela et al found AATP to occur isolated or to be associated with systemic lupus erythematosus (SLE), respectively.[6] Hashimoto et al in 2016 found its

association with other autoimmune disorders.[7] Lugassy found its association with hematological malignancies such as non-Hodgkin's lymphoma.[8] Rheumatoid arthritis is a chronic inflammatory disease with cellular and humoral dysfunction brought about by autoimmune mechanism. The frequently observed findings in rheumatoid arthritis are hypergammaglobulinemia, autoantibodies, etc. Though thrombocytopenia is a rare complication of rheumatoid arthritis, our patient had only this as the positive findings.

It has been postulated by previous *in vitro* studies that both cell mediated and humoral mediated immune system is responsible for this disease. Cell-mediated factor leads to suppression of megakaryopoeisis by affecting megakaryocytic progenitor cells[9] and humoral-mediated immune activity leads to suppression of antithrombopoeitic antibodies.[10]

Till date no standard treatment protocol is available for management of AAPT. Based on the proposed autoimmune mechanism as the underlying pathology various immune suppressive agents have been utilized for the management of this entity.

CONCLUSION

Patient presenting with unexplained thrombocytopenia not responding to corticosteroid needs further evaluation with bone marrow aspiration and biopsy to establish the diagnosis of AATP aplasia as this entity is rare and requires focused management and monitoring.

Acknowledgment

I take this opportunity to extend my gratitude and sincere thanks to all those who helped me to complete this study.

I am highly thankful to Department of General Medicine, Pathology, Biochemistry and Microbiology for providing me adequate facility which helped me to carry out this study.

I owe great sense of indebtedness to Medical Superintendent IGIMS, Patna for permitting me to carry out this study.

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■■■■

Breakfast Like a King: Three-Meal Diet Improves Type 2 Diabetes

Eating a carbohydrate-rich breakfast followed by a substantial lunch and a small dinner — the so-called "three-meal diet" (3Mdiet) — promotes weight loss and significantly improves glucose control in type 2 diabetes, a randomized, controlled trial suggests.

The 3Mdiet improved glycemic control so significantly that patients could reduce their total daily insulin dose, along with the need for additional antidiabetic medications, relative to baseline, the study indicates. The findings were published in the December issue of *Diabetes Care*.

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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.

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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. 30, No. 8, January 2020

Low-dose Spinal Anesthesia: A Safe Option in Molar Pregnancy with Thyrotoxicosis

BHAVNA SRIRAMKA*, RANJITA ACHARYA†

ABSTRACT

Hydatidiform mole often has an association with thyrotoxicosis. Molar pregnancy usually presents with severe vaginal bleeding requiring emergency suction evacuation and time for proper treatment of thyrotoxicosis may not be available making perioperative management of these patients difficult. We recently had an encounter of a 26-year-old female of hydatidiform mole associated with thyrotoxicosis presenting with vaginal bleeding, which was successfully managed with low-dose spinal anesthesia under cover of antithyroid medication, steroids and β blockers. Patient was then shifted to intensive care unit in the postoperative period and later to the ward after 2 days. Eventually, she was discharged on the fifth postoperative day with near normal thyroid profile and completely asymptomatic. Timely diagnosis with a high-degree of suspicion of thyrotoxicosis association, proper anesthesia plan and vigilant postoperative management is essential in dealing such a dreadful situation. We recommend low-dose spinal anesthesia as a safe option in such situation.

Keywords: Hydatidiform mole, thyrotoxicosis, low-dose spinal anesthesia, safety

Gestational trophoblastic disease is an abnormal proliferation of trophoblastic epithelium of which hydatidiform mole is a result of malformation of chorionic vilosities predisposing to malignant neoplasia. Curry et al described it as a pregnancy usually lacking an intact fetus, in which the placental villi are characterized by edema and loss of vasculature, and showing varying degrees of trophoblastic proliferation.[1] It may present with many complications, of which trophoblastic thyrotoxicosis is life-threatening.[2] Complete moles have prevalence of hyperthyroidism as high as 7%.[3] Thyrotoxicosis and hemorrhage have overlapping signs and many times can be missed. We hereby present a case where a molar pregnancy associated with hyperthyroidism presented with vaginal bleeding and was posted for emergency dilation and curettage. It highlights the perioperative management and optimization of hyperthyroid state prior to surgical evacuation of the hydatidiform mole.

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CASE REPORT

A 26-year-old patient weighing 48 kg with body mass index (BMI) 26.2 was admitted to the Dept. of Obstetrics and Gynecology with complaints of amenorrhea of 12 weeks, abdominal pain and vaginal bleeding. She was febrile (101.6°F), tachypneic (respiratory rate [RR]-26), tachycardiac (127 bpm), hypertensive (160/92 mmHg), with pale mucous membranes and dehydrated. Urine pregnancy test was positive. Thyroid gland was palpable and of normal size. Cardiorespiratory examinations were normal.

Laboratory investigations upon admission were hemoglobin - 8.2 g/dL, hematocrit - 30.3%, leukocytes - 13,800, platelets - 3.04 lacs, with normal coagulation profile, decreased thyroid-stimulating hormone (TSH) - 0.08 (range 0.35-5.5) and raised total T3 - 388 ng/dL (range = 80-150 ng/dL). The levels of human chorionic gonadotropin (hCG) were 6,38,000 UI/L. Abdominal pelvic ultrasound showed uterine volume of 1,680 cm^3 with multiple anechoic cystic vesicles compatible with complete hydatidiform mole. She was shifted to the operating room on the same day of hospitalization to undergo an emergency uterine curettage due to severe vaginal bleeding.

A high risk informed and written consent for anesthesia and surgery was taken and availability of postoperative intensive care unit (ICU) care was ensured. A low-dose

spinal anesthesia was planned. The goals were to reduce temperature, tachycardia, hypertension and proper oxygenation with adequate anesthesia. One hour prior to the surgery - tablet propylthiouracil 150 mg was given followed by injection dexamethasone 2 mg IV, injection dexmedetomidine started @1 μg/kg for 10 minutes followed by 0.4 μg/kg/hr and along with it infusion of injection esmolol started @1 mg/kg IV over 30 seconds and then 0.2 mg/kg/min titrated according to heart rate and blood pressure. Injection acetaminophen 500 mg was given for temperature control. Hydration was maintained with Ringer lactate.

Spinal anesthesia was given with intrathecal 2 mL of bupivacaine (0.5% H) and 25 μg of fentanyl given after clear aspiration of cerebrospinal fluid (CSF) in L2-L3 space. After 8 minutes, the motor block was Grade 2 (Bromage scale) and sensory block was T8. Patient was lightly sedated and comfortable. Vitals were stable with heart rate reduced to 98/min, blood pressure reduced to 134/86 mmHg and RR 14/min, temperature dropped to 100^0F maintaining SpO_2 99%. She was allowed to breath in venturi mask with FiO_2 of 0.5. Surgeons were then allowed to perform uterine curettage. One unit of whole blood was transfused. Surgery went uneventfully and then patient was shifted to the ICU, where she was continued on tablet propylthiouracil 100 mg 8-hourly for 1 day and dexamethasone was tapered over 4 days. Tablet propranolol 10 mg 8-hourly was given for 2 days. Patient was hemodynamically stable in the postoperative period, was shifted to the regular ward after 2 days and from the hospital after 5 days.

DISCUSSION

Complete hydatidiform mole, most commonly presents with vaginal bleeding occurring at 6-16 weeks of gestation in 80-90% of cases, followed by hyperemesis and hyperthyroidism.[2,4,5] Acute respiratory distress syndrome (27%) has also been reported as a result of trophoblastic embolization, sepsis, amniotic fluid embolism and transfusion related acute lung injury.[6] Consumption coagulopathy is yet another complication which may be due to factors released by the molar tissue that could trigger the coagulation cascade, resulting in disseminated intravascular coagulation (DIC) and multiorgan failure.[7]

Clinical hyperthyroidism in a patient with hydatidiform mole was first reported in 1955 by Tisne et al.[8] The glycoprotein hormone hCG has a structural analogy with TSH and so can cause cross-reactivity with their receptors.[9] For every 10,000 mU/mL increase in serum hCG, FT4 increases by 0.1 ng/dL and TSH decreases by 0.1 mIU/mL.[10] Hyperthyroidism may be a result of this significant rise in hCG levels in hydatidiform mole, which calls for a prompt treatment, that is, uterine evacuation, thereby decreasing the hCG values. Hyperthyroidism can co-exist with anemia secondary to vaginal bleeding and their clinical presentations are often overlapping. Tachycardia, tachypnea with fever and hypertension calls for a suspicion of thyroid storm.

High output cardiac failure, thyroid storm, hypertension, embolization of pulmonary arteries, hypovolemia, DIC and pulmonary edema are the anesthetic challenges to be aware of when dealing with molar pregnancy.[11,12] Goals of anesthetic management are to ensure hemodynamic stability and maintain proper oxygenation thereby providing adequate anesthesia for surgery. Both regional and general anesthesia have been described in the literature for management of molar pregnancy.[13]

In hypotensive patients with bleeding, the choice is general anesthesia. Regional anesthesia is a safer option in stable patients with emergency surgeries with full stomach having the advantages of no tocolytic effect on the uterus and avoiding airway instrumentation but is contraindicated in DIC.[3,14] Our patient diagnosed with hyperthyroidism having hypertension, and severe bleeding was stabilized in the limited time available with antithyroids, steroids, sedatives, blood transfusion and IV fluids and planned for a low-dose spinal anesthesia to prevent hemodynamic instability.

CONCLUSION

Anesthesiologists need to be vigilant of the perioperative complications associated with a molar pregnancy. A detailed work-up, optimization of the patient, careful selection of anesthesia with postoperative intensive care management is of paramount importance when dealing any case of molar pregnancy.

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Minimizing Hypoglycemia in Diabetes

The US Department of Health and Human Services has identified hypoglycemia as one of the top three preventable and measurable adverse drug events in a recent article published in the December 11 issue of the *Journal of Clinical Endocrinology and Metabolism.*

Hypoglycemia is defined in:

- Level 1: Glucose <70 mg/dL and ≥54 mg/dL
- Level 2: Glucose <54 mg/dL; needs immediate action
- Level 3: A severe event characterized by altered mental and/or physical status requiring assistance.

Remember the three measures:

Measure 1:

Identify high risk patients–

- First assess if the patient has experienced a previous Level 2 or Level 3 hypoglycemic event within the past year. If not, then proceed to;
- Second, if the patient has a prescription for insulin and/or insulin secretagogues and has an A1c <7% documented within the past 6 months. If not, then proceed to;
- Third, if the patient has a prescription for insulin and/or insulin secretagogues and at least one relevant comorbidity.

Measure 2: Educate patients and caregivers who are at greater risk for hypoglycemia.

Measure 3: Encourage patients to report hypoglycemic events.

Board Games Protect Against Cognitive Decline

Playing board games may protect against cognitive decline and even boost cognitive function in seniors, new research suggests.

Results of a large, longitudinal study showed that higher frequency of playing board games, which are also known as analog games, seemed to guard against cognitive decline. Even among individuals in their 70s, those who played more board games experienced less decline in memory and other cognitive measures compared to their counterparts who either did not play board games or who played fewer board games. The study was published online in the *Journals of Gerontology: Psychological Sciences*.

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Systemic Amyloidosis Presented as Carpal Tunnel Syndrome: An Unusual Presentation

TARACHAND SAINI*, KANCHAN KUMAWAT†, BANSHI LAL KUMAWAT‡, CHANDRAMOHAN SHARMA#

ABSTRACT

Systemic amyloidoses are multisystem disorders caused by abnormal proliferation and deposition of insoluble amyloid proteins in various body organs and tissues, eventually leading to organ dysfunction and death. The organs most commonly affected are the kidney, heart and liver. Patients usually present with nonspecific symptoms like fatigue, weight loss and pedal edema followed by symptoms and signs related to specific organ involvement. We report a patient of systemic amyloidosis who presented with sign and symptoms consistent with carpal tunnel syndrome, with no systemic features, that is an unusual presentation.

Keywords: Systemic amyloidosis, carpal tunnel syndrome, amyloid protein

Amyloidoses are a heterogenous group of disorders caused by extracellular deposition of insoluble fibrillar proteins arranged in a β-pleated sheet conformation throughout the body.[1] Term "amyloid" was given by Rudolph Virchow in 1854 to describe tissue deposits that stained like cellulose when exposed to iodine. Amyloid deposits, after staining with Congo red stain, appear red under normal light microscopy and have apple-green birefringence under polarized light.[2]

Traditionally, amyloidosis was classified as localized and systemic, familial and nonfamilial form. However, nowadays amyloidosis can be classified chemically depending on chemical nature of amyloid protein. Capital letter A is designated for amyloid followed by an abbreviation for the type of fibril protein. In previously so called primary amyloidosis and myeloma-associated amyloidosis, the fibril protein is an immunoglobulin light chain or light chain fragment (abbreviated L), therefore this type of amyloidosis is now know as light chain amyloidosis (AL). Common clinical forms of systemic amyloidosis are AL, AA, ATTR and Aβ2M types.[3]

CASE REPORT

A 59-year-old male presented with history of tingling sensation, paresthesia of thumb, index and middle fingers of both hands for last 3 years, predominantly during night time, difficulty in gripping objects and difficulty in doing fine motor activities for last 2 years. There was no history of numbness over the hands as patient could perceive hot and cold sensation.

He also had complaints of rash over face, neck and upper chest for last 1½ years, initially erythematous then papulonodular followed by hyperpigmentation over face and patches of waxy discoloration (hypopigmentation) below eyes for last 5-6 months, interspersed with punctate bleeding points. He took homoeopathic treatment for 1 year but had no relief. Dermatologist diagnosed it as a case of seborrheic dermatitis with pyoderma and started oral steroids for 6-7 months without improvement. He also had significant weight loss of around 10 kg in the last 1 year without decreased appetite, low backache for 3-4 months and swelling of tongue and ulcerations over tongue for last 15-20 days. There was no history of diabetes and hypothyroidism.

General physical examination revealed coarse facies, pallor, waxy papules over face and chest, purpuric lesions to almost confluent ecchymotic patches,

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macroglossia (Fig. 1). On per abdominal examination, there was no organomegaly. Central nervous system (CNS) examination revealed weakness of small muscles of hand in median nerve distribution. Tinel's and Phalen's sign were positive, ankle jerk was decreased on right side and absent on left side. Straight leg raise (SLR) was positive bilaterally (left-50°, right-60°). Autonomic function tests were normal. Peripheral nerves were not palpable.

A functional diagnosis of bilateral (B/L) carpal tunnel syndrome with B/L L5-S1 radiculopathy with papulonodular and purpuric rashes with macroglossia and significant weight loss was made. Possibility of a multisystem disease involving peripheral nerves, nerve roots, skin and soft tissue, small vessels and tongue was kept. Differentials considered were connective tissue disorders, systemic amyloidosis, sarcoidosis and paraneoplastic disorders.

Routine investigations revealed: Fasting blood sugar (FBS) - 86 mg/dL, blood urea - 58 mg/dL, serum creatinine - 1.6 mg/dL, serum uric acid - 3.6 mg/dL, serum calcium - 9.7 mg/dL, phosphate - 2.7 mg/dL, sodium - 142 mEq/L, potassium - 4.0 mEq/L, total bilirubin - 0.8 mg/dL, serum glutamic oxaloacetic transaminase (SGOT) - 24 IU/L, serum glutamic pyruvic transaminase (SGPT) - 51 IU/L, alkaline phosphatase - 106 IU/L, lactate dehydrogenase (LDH) - 433 U/L, creatine phosphokinase (CPK) - 99 U/L, thyroid-stimulating hormone (TSH) - 3.31 mIU/L, serum vitamin B_{12} - 483 pg/mL, hemoglobin - 7.7 g/dL, total leukocyte count (TLC) - 5,460/mm^3, erythrocyte sedimentation rate (ESR) - 80 mm/hr, rheumatoid factor - negative, C-reactive protein (CRP) - positive. Peripheral blood smear - normocytic normochromic, no abnormal cells, urine protein - trace, RBC - 10-12/hpf. Total protein - 6.8 mg/dL, albumin - 3.5 mg/dL, A:G ratio = 1:1, human immunodeficiency virus (HIV) - nonreactive, serum cortisol - 9.63 μg/dL (5-25). ECG and chest radiographs were normal. Nerve conduction study showed sensorimotor axonal and demyelinating neuropathy affecting both median nerves suggestive of B/L carpal tunnel syndrome. Sympathetic skin response was negative. Ultrasonography of abdomen and pelvis showed B/L early medical renal disease. Magnetic resonance imaging (MRI) LS spine showed disc bulge at L4-5 and L5-S1 levels with ligamentum flavum hypertrophy causing B/L lateral recess stenosis and compression of exiting nerve roots. Dermatology consultation confirmed waxy papules and pinch purpura over face and chest, but skin biopsy was negative for amyloid stain. Rectal biopsy showed evidence of chronic inflammation but negative for amyloid stain on Congo red. CT thorax and abdomen was negative for any hilar lymph nodes but hepatomegaly was present. Skull radiograph did not show any lytic lesion and urine for Bence-Jones protein was negative. Serum protein electrophoresis was positive for M-band (γ-globulin fraction - 32.8%) with A/G ratio reversal (0.73).

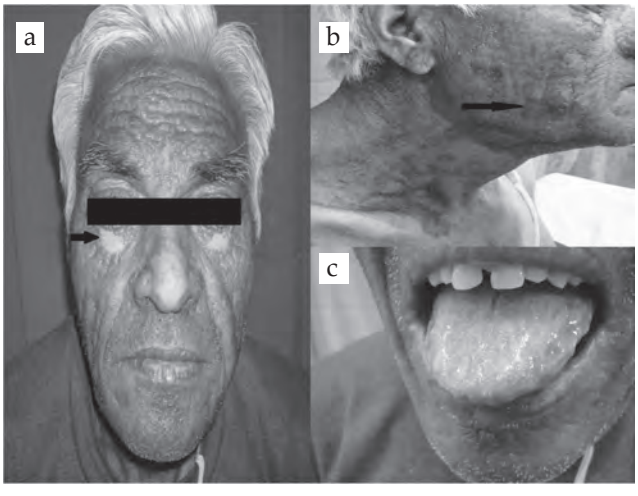

Figure 1. Hypopigmented patches below eyes **(a)**, ecchymotic patches on face **(b)** and macroglossia **(c)**.

At this point, hemato-oncologist opinion was taken and bone marrow aspiration and biopsy was done. Bone marrow smear showed normoblastic erythroid hyperplasia with increased number of plasma cells (12%). Bone marrow biopsy was hypercellular with M:E ratio of 4:1 with 35% plasma cells suggestive of plasma cell myeloma. Tongue biopsy revealed submucosal deposits of pink acellular hyaline material with apple-green birefringence on polarizing microscopy suggestive of amyloidosis (Fig. 2). 2D Echo study was negative for any cardiac deposits.

So, a final diagnosis of AL amyloidosis secondary to plasma cell myeloma was considered with multiple organ system involvement in the form of neuropathy,

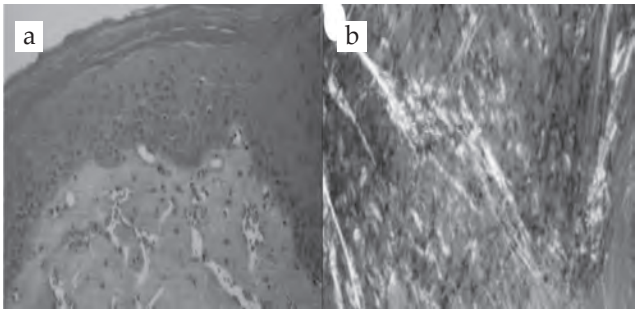

Figure 2. Tongue biopsy revealed submucosal deposits of pink acellular hyaline material on H&E stain **(a)** and apple-green birefringence on polarizing microscopy **(b)**.

radiculopathy, skin, subcutaneous tissue and small blood vessels involvement, macroglossia, hepatomegaly, nephropathy and bone marrow plasmacytosis.

Patient was started on a chemotherapy regimen which included induction with bortezomib, lenalidomide and dexamethasone once a week for 24 weeks followed by maintenance with lenalidomide and plan for bone marrow transplantation after complete remission. After 6 months of chemotherapy, skin lesions showed healing with serum electrophoresis showing γ-globulin fraction of 15.4% with A/G ratio of 1.47 and bone marrow plasma cells reduced from 35% to 8%, suggestive of partial to near complete remission of myeloma.

DISCUSSION

AL amyloidosis is usually associated with plasma cell dyscrasias. Insidious onset, diverse clinical manifestations and initial presentation with vague symptoms make diagnosis more difficult. Multiple organ systems are involved, kidney and heart being most commonly affected. Liver involvement is seen in 15-25% of patients and cardiac involvement in up to 50%.[4]

Approximately 90% patients present with profound fatigue, weight loss and edema. Edema may have multiple causes including hypoalbuminemia (from kidney, bowel or liver involvement) and right-heart failure.[5]

Our patient presented with tingling sensation, paresthesia of thumb, index and middle finger with weakness of both hands in the median nerve distribution suggestive of carpal tunnel syndrome. While systemic amyloidosis presenting as a carpal tunnel syndrome is very rare, this syndrome results from progressive infiltration of flexor retinaculum and synovial tissue with amyloid fibrils causing compression of the median nerve.

Peripheral nerve involvement in amyloidosis occurs very late in the disease course. The typical pattern of amyloid neuropathy is diffuse, symmetrical, length-dependent, lower-limb predominant, primarily axonal with prominent involvement of small (pain and autonomic features) fibers.[6] Nerve conduction studies show changes of axonal neuropathy with low amplitude or absent sensory nerve action potentials (SNAPs) and low amplitude compound muscle action potentials (CMAPs) but preserved motor conduction velocities. Distal median motor latencies are prolonged in patients with carpal tunnel syndrome.

Skin involvement in the form of petechiae, purpura and ecchymoses occurs due to infiltration of blood vessel walls by amyloid deposits.[7] Similar cutaneous lesions were also seen in our patient in the form of erythematous papulonodular rash and ecchymotic patches over face, neck and upper chest. Vascular infiltrates result in easy bruising typically seen around the eyes producing "raccoon-eyed" appearance.

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Social Media Use Linked to Teen Disordered Eating Behaviors

Adolescents who are active on social media may be more likely to exercise excessively, skip meals or develop other forms of disordered eating, a US study suggests. Researchers surveyed 996 seventh- and eighth-graders, age 13 on average, about their use of social media platforms like Facebook, Instagram, Snapchat and Tumbler. They also asked kids about disordered eating behaviors like worrying about their weight or shape, binge eating, skipping meals or strict exercise regimens. Overall, 75% of girls and 70% of boys had at least one social media account, and 52% of girls reported at least one disordered eating behavior along with 45% of the boys, according to the report in the *International Journal of Eating Disorders*… (*Reuters*)

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Patient-Physician Relationship and Science

AMIT AGRAWAL*, LUIS RAFAEL MOSCOTE-SALAZAR†, BHATTARAI V SUBRAHMANYAM‡

The lack of trust has emerged as a global issue affecting many areas, including health care.[1,2] Trust is important to get comprehensive information and thus offer evidence-based care for best outcome in patient-physician relationship. Traditionally, "Branding" reflects the performance of an enterprise, quality of finished product and customer satisfaction (sometimes replacement guarantee or buy one get one). Heterogeneity is the core of health care and includes heterogeneity of health (care providers, care seekers, care options, related conditions), excellent to worse outcomes, health care-related information sources (with varying reliability and interpretations) as well as individuals to large organizations to deliver (health care delivery). With this heterogeneity, can we apply the same principles of corporate functioning to health care? Integrity, quality control and co-ordination are extremely important to achieve best outcomes;[3,4] any breach can affect the trust and confidence.[1,2] We need to rethink is it "Mistrust in Science—A Threat to the Patient-Physician Relationship" or "Mistrust in Patient-Physician (Institution) Relationship—A Threat to the Art and Science of Medicine"?

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Projects in Colombia and Peru Win Social Innovation in Health Prizes

Projects to identify infants exposed to Zika virus in Colombia, to improve maternal health in rural communities of the Peruvian Amazon, and to increase nutrition in rural Colombian communities were among the winners of 2019 Social Innovation in Health Initiative awards announced by the Pan American Health Organization (PAHO).

Launched in 2014, the Social Innovation in Health Initiative (SIHI) is led by the Special Program for Research and Training in Tropical Diseases (TDR) hosted by WHO and cosponsored by UNDP, UNICEF and the World Bank. SIHI is supported by The Swedish International Development Cooperation Agency (Sida)… (*PAHO*)

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Can a Registered Medical Practitioner Compel or Force his Patient to Purchase the Drug/Medicine from him Only?

KK AGGARWAL*, IRA GUPTA†

No, the registered medical practitioner cannot compel or force his patient to purchase the drug/medicine from him only. Though as per Item No. 5 of the Schedule K of the Drugs and Cosmetics Rules, 1945 and Clause 6.3 of the Code of Medical Ethics, the registered medical practitioner is entitled to supply the drugs to his patients which have been prescribed by him.

However, the registered medical practitioner cannot compel or force the patients or his relatives/friends to purchase or take the medicine from the said registered medical practitioner as held by the **Hon'ble National Consumer Disputes Redressal Commission in its landmark judgment dated 22.07.2014 titled as Fortis Health Management (North) Ltd. vs Meenu Jain & Anr.**

In the case titled as **Fortis Health Management (North) Ltd. vs Meenu Jain & Anr.,** on 25.05.2009, Meenu Jain was admitted to Fortis Escort Hospital, Jaipur, Rajasthan (OP) for treatment of Guillain–Barré syndrome (GBS). The Complainant signed a general consent for admission. On 25.06.2009, the patient was on ventilator and administered life-saving drug injection Iviglob Ex, five doses daily, for 5 days. The cost of each injection- MRP was Rs. 18,990/-. Those injections were provided by hospital pharmacy and the Complainant was successfully treated and discharged on 13.06.2009. The total sum of Rs. 6,82,965/- as hospitalization charges were paid by the Complainant without any protest.

The Complainant alleges that, he was told that the cost per injection was Rs. 9,000/-. The Complainant 2 requested the hospital authorities that the injection Iviglob Ex was available at 30-40% discount in the other medical shops in the market and he may be permitted to purchase the injections from outside, but his request was not considered and he was forced to purchase the injections from the hospital itself.

The Hon'ble Commission held that:

"8. We find that, the Complainant singed the consent and the counseling form, but it is also important to understand the state of mind of the Complainant 2 as his wife Meenu Jain was in a critical condition in OP Hospital. The OP was in a dominating position over the Complainants. Also, the Complainants agreed to pay the expenses of drugs and medicines and other consumables as per rates of the hospital, but it is also an admitted fact that the hospital authorities did not permit the Complainant to purchase the injection "Iviglob Ex" from outside, despite repeated verbal requests. Those injections were allegedly available in the market at lesser price and he was forced to buy the injections from the hospital itself. Thus, the hospital authorities indirectly imposed unjustified and unreasonable conditions on the Complainant to purchase the injections from the hospital, for the treatment of the patient. The counsel for OP argued that, to ensure quality and genuineness of the drugs, the OP did not permit the patients to buy the drugs from outside which is not at all convincing and reasonable. The OP sold the injections at the maximum retail price (MRP), and not charged any excess amount.

9. We have given a thoughtful consideration and feel that the patient was suffering from GBS, a serious disease, and was in a critical condition. No doubt, the OP Hospital has treated her and cured her. We know that, the corporate hospitals purchase the medicines, surgical items, consumables, in bulk. Certainly huge margin is available, while procurement. OP has not produced it's purchase bills of those injections. In the open market, certainly the distributors or Pharmacy shops offer discounts on the medicines. The injection Iviglob Ex is a very expensive drug, which will be available at discounted price in open market, hence the OP should have allowed at least marginal discount of about 10-20%. The corporate hospitals should not be a commercial/business centres for profiteering from the exploitation of such critical patients, who have to pay sky rocketing hospital bills. Regarding contention of OP about spurious drugs, the OP was at liberty to explain the pros and cons of drugs brought from outside market, and after due consent from the complainants, they could have administered the injections."

*President, HCFI
†Advocate and Legal Advisor, HCFI

Indian Journal of Clinical Practice, Vol. 30, No. 8, January 2020

Low-cost Solution to Air Pollution: DAV Public School, Shreshtha Vihar, New Delhi

For today's revolutionary world, we are presenting a revolutionary innovation - AIRX mask along with a building setup, which in terms is known as Air Impurity Reducer X. In this competitive world, we are standing at par with the other air purifiers which consider themselves to be the best in the market. Now, we are up with this innovation which is far away advanced from their technology at a considerably cheap rate.

It is a low-cost solution to one of the biggest threats to the world i.e., the air pollution. The AIRX mask consists of several layers of purification which is more efficient than other existing air purifiers and the building setup provides fresh and carbon free air to the rooms of the building. AIRX mask can be available nearly at one-tenth of the cost of existing air purifiers.

Nowadays, in the world of consecutive development and considerable modernization, there is an obvious utilization of resources which in turn leaves something which is undesirable to patch with the continuous modernization.

One such factor is AIR POLLUTION which is mostly faced by every generation around the globe. It is now creating hindrance in the betterment of the health among different people in the society.

Along with World Health Organization (WHO), other health organizations related to major countries which have even alarmed for hazardous levels of rising air pollution are now considerate about this big issue worldwide and are all together working to deal with this problem.

It is majorly caused by the different industrial actions and human interference and therefore majorly comprises of harmful gases and dust particles which are released in the atmosphere at considerably high levels and harming our Mother Earth.

In order to rectify this major threat to the world, we have introduced AIRX mask and building setup. The AIRX mask consists of 8 layers of different constituents which are used to purify the air reaching the individual by eliminating the pollutants to the maximum extent. The air passes through these 8 special layers of purification that makes air fresh, hygienic and clean and detoxifies it when inhaled by the person with respect to its surroundings.

The 8 layers of purification are shown as follows:

Name of the layer	Components	Usage
Protection mesh	**Wire gauge**	**Basic protection**
Ultraviolet LED	Light emitting diode with UV rays	Purification of microbial and bacterial interferences
Sponge mesh	Fine sponge with micro spaces	Purification of PM 2.5 and 10
Wet cotton cloth	Cotton fiber with moisture	Purification of pollen, dust and oxidation of air
Statically charged polymer fiber	Polymer fiber with static charge	Purification of electromagnetic particles
AIRX special tube	Wire gauge with negative and positive current	Separation of carbon particles and smoke
Nanofiber	N-95 fiber	Separate oil molecules and complex pollutants
Cloth with essence	Cloth dipped in liquid sandalwood	Providing fragrance
Air impurity detector	Mq-2 Gas sensor motherboard buzzer	Alarming the user about extreme levels of hazardous air and providing information about air quality index

- The first layer of ultraviolet LED is capable of purification of bacterial and microbial pollutants, which often cause diseases when inhaled.
- The second layer is a fine sponge mesh, which has fine pores, which help in the purification of PM 2.5 and 10, and other dust particles of average size.
- The third layer is the wet cotton cloth which is efficient for purifying fine dust particles,

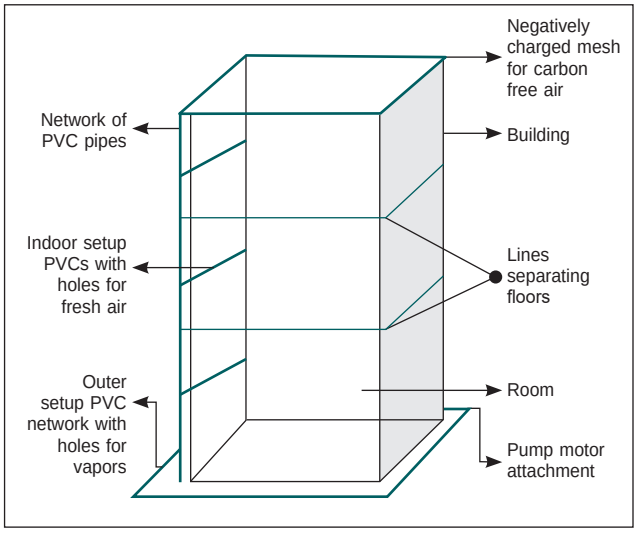
granules and pollen dust, which are the most common pollutants and cause 'Asthma'.

- The fourth layer is of polymer fiber which is capable of purification of electromagnetic particles and metallic dust along with oil vapors, which are purified by the static charge acquired by the polymer fiber.
- The fifth layer, that is the AIRX special tube, is one of the most important layers in this mask. This layer is capable of separating carbon particles and smoke. The wire gauge in this special tube acquires negative charge. The air passing through this gauge faces negative charge which is then acquired by the carbon and methane. Then, the carbon and methane particles get stuck to the positively charged coil. Therefore, highly purified air is passed on to the next layer.
- The sixth layer is of nanofiber cloth which is efficient in separating tiniest pollutants along with oil vapors and complex particles. Since, this mask has two different layers of oil separation, therefore, this property makes it of P grade and that too of 100 rating.
- The last layer is of cloth scented with sandalwood's essence as to make it feel tropical.
- The MQ-2 Gas sensor alarms the users about extremely hazardous levels of air pollution and provides the accurate information about air quality index anytime with just a connection with the app.

The different layers of this mask make it much more efficient than the present air purifiers and masks. The two layers of purification of oil vapor makes it similar to the present masks of the highest grades. In addition to this, our mask has several more layers which makes it even more advanced than the present masks and air purifiers. Moreover, the compact design makes it more mobile and easy to use. The Gas sensor too plays its important role in the mask by alarming the user. These different and efficient properties of this mask make it highly advanced and it can be used commonly for industrial uses and for daily uses. Its cost is nearly one-tenth the worth of present air purifiers but at the same time it is 3 times better than them.

The more efficient the infrastructure is the lesser is the amount of the residue left behind as the unwanted face of development. The infrastructure that we ought to provide is one which is considered responsible for providing fresh and carbon free air. If this setup is applied on the buildings then it can prove useful for reducing air pollution.

There are 2 parts of AIRX setup, that is outer and indoor setup, depicted below:



The inner setup has 1 pipe in each room depicted above. At the top, there is an open space with wire mesh (negatively charged). All the carbon particles acquire the charge and are destroyed, therefore, providing fresh air in the rooms of the building. The air then enters the room through the holes of the pipe attached to the wall. The people present in this room will breathe carbon free and hygienic air.

The outer setup is a network of PVC pipes with holes at equivalent distances. There is a pump motor attachment that is connected to the pump motor. Along with it, there is a heating element which heats up the water quickly. The pump motor pumps the hot water and through the holes in the network of pipes the vapor form of water rises out which settles down the dust particles suspended in the air around the building (same as mist).

Both AIRX mask and building setup (indoor and outdoor) provide the maximum level of quality air to its customers and users. It is a very useful product as it helps in fighting one of the biggest threats to the Mother Earth and living beings that is 'The Air Pollution'.

At last, AIRX can revive the way of living and can improve the Air Quality.

Thus, it is a true "AIR IMPURITY REDUCER" as well as air quality enhancer.

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Indian Journal of Clinical Practice, Vol. 30, No. 8, January 2020

Low-cost Solution to Air Pollution: Bluebells School International, Kailash Colony, New Delhi

"Every once in a while, a new technology, an old problem, and a big idea turn into an innovation."

It is prominent that how today pollution is at its peak, fossil fuels are depleting, and garbage is seen and felt all over the city. Though it is practically not possible to completely eradicate and eliminate these problems from our lives we surely can aim towards reducing them. Finding innovative solutions for the problems of today is the need of the hour, and thus the proposal of the idea of a smart city which has solutions to many of the problems that are polluting the society today can help bring about a change and small contributions and thoughts can help in the long run. The various issues tackled by this smart city are as follows:

- Waste Management
- Excessive use of plastic
- Depletion of fossil fuels
- Depleting air quality
- No use of nature as resource
- Chemical pesticides and insecticides deteriorating food quality.

WASTE MANAGEMENT PLANT

Garbage all around the cities has become a major problem and thus to combat this issue a waste management plant has been installed in this city, which has two basic units as per the collection of waste throughout the city, i.e., Dry waste and Wet waste. Dry waste, which consists of paper, plastic, etc., will be incinerated and the heat further produced by it shall be put under high pressure and be used to rotate turbines and thus generate electricity. This electricity can further be used to charge power stations in order to run battery operated cars to eradicate the decades of dependency of transportation on fossil fuels. Wet waste on the other hand consists of fruit peels, vegetables, etc., which will be used to produce manure and organic fertilizers to enhance and promote natural growth of plants.

PURIFICATION AIR THROUGH ADSORPTION

Harmful gases like nitrogen dioxide, carbon monoxide, etc., have been depleting the air quality invariably which is causing a lot of harm to the people all over the world. These gases on inhalation affect our lungs and other vital organs.

To combat this problem roads of this smart city have been made from activated charcoal, which works on the principle of adsorption. Activated charcoal works on the principle of adsorption, crushed charcoal when rubbed on roads will adsorb gases like nitrogen dioxide, carbon monoxide, etc. We also have air purifiers installed on building that have filters made of activated charcoal.

Principle and Mechanism of Adsorption

Adsorption is defined as the deposition of molecular species onto the surface. It is a surface phenomenon that leads to transfer of a molecule from a fluid bulk to solid surface. This can occur because of physical forces or by chemical bonds. The molecular species that gets adsorbed on the surface is known as adsorbate and the surface on which adsorption occurs is known as adsorbent. Common examples of adsorbents are clay, silica gel, colloids, metals, etc.

OTHER ALTERNATIVES

A random look at any construction site would make one understand what city pollution is. As a solution we can have mosses spread over buildings to absorb and filter the dusty air furthermore we can have buildings made up of fly ash bricks. Due to the special nutrient uptake, mosses are forced to absorb not only dissolved salts and dust particles from rainwater or dew but also atmospheric pollutants. Therefore, they are valuable bio-indicators of the air pollution.

IMPROVED FARMING

Aphids, spider mites and other pests can cause serious damage to flowers, fruits and vegetables. These creatures attack your garden in swarms, literally draining the life from your crops and often inviting disease in the process. Many chemical pesticides, like those containing glyphosate, can prove unsafe for the environment or may make fruits and vegetables

unsafe for consumption. Shifting to organic farming involving use of natural insecticides and pesticides should be a tentative solution. We can also inculcate the process of drip irrigation to water our plants and crops.

Steps involved in making organic insecticide:

- Mix 1 cup of vegetable oil
- 1 tablespoon of soap (cover and shake thoroughly)
- Then when ready to apply, add 2 teaspoons of the oil
- Mix with 1 quart of water, shake thoroughly
- Spray directly on the surfaces of the plants which are being affected.

Steps involved in making organic fungicide:

- Mix 2 tablespoons
- Per gallon of water and spray on plants. Apply once per month.

Steps involved in making an organic pesticide:

- Mix 1/2 c (113 g) of hot peppers with 1/2 c (113 g) of garlic or onion. Chop up all the vegetables thoroughly.
- Blend the vegetables together in an electric blender. Transfer the chopped veggies to a blender or food processor. Pulse the mixture until it forms a thick, chunky paste.
- Add the vegetable paste to 2 c (500 mL) of warm water. Measure out the warm water and pour it directly into the blender. Give the ingredients a stir to thoroughly mix them together.
- Pour the solution into a glass container and let it sit for 24 hours.
- Strain the mixture. Pour the solution through a strainer, removing the vegetables and collecting the vegetable-infused water into another container. This water is your pesticide. You can discard the vegetables or put them in your compost.
- Pour your pesticide into a squirt bottle. Make sure that the spray bottle has first been cleaned with warm water and soap to rid it of any potential contaminants. Use a funnel to transfer the liquid into the squirt bottle and replace the nozzle.
- Spray your plants with the pesticide. Treat the infected plants every 4-5 days with the solution. After 3 or 4 treatments, the pests should scatter. If the area is thoroughly covered with the solution, this pesticide should keep bugs away for the rest of the season.

BIO-PETROL PRODUCTION

Decades of dependency on fossil fuels cannot disappear in a few days but it can surely be reduced so production of bio-petrol from rancid oil is one way of doing this where a meter would keep a check on collection and production of petrol. We take rancid oil and methanol in the ratio 1:3 and add KOH as a catalyst for the production of this bio-petrol. This reaction is called trans esterification reaction.

Furthermore, the leftover harmful thermocol which is nonbiodegradable can be dissolved in petrol to make landfills and useful adhesive. It works on the principle that like dissolves like.

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Long Naps, Lots of Sleep Tied to Higher Stroke Risk

Sleeping more than 9 hours a night or taking long midday naps were each associated with increased risk of incident stroke in a large, prospective cohort study.

Compared with 7-8 hours of sleep, 9 or more hours increased the risk of stroke by 23% (hazard ratio [HR] 1.23; 95% CI 1.07-1.41), while 6 hours of sleep had no significant effect on stroke risk, reported Xiaomin Zhang, MD, PhD, of Huazhong University of Science and Technology in Wuhan, China, and colleagues in *Neurology*. A regular midday nap lasting more than 90 minutes also boosted stroke risk by 25% (HR 1.25; 95% 1.03-1.53) compared with napping for a half-hour or less.

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Low-cost Solution to Air Pollution: Bal Bhavan International School, Dwarka, New Delhi

Air pollution is a mix of particles and gases that can reach harmful concentrations both outside and indoors. Its effects can range from higher disease risks to rising temperatures. Soot, smoke, mold, pollen, methane and carbon dioxide are a just few examples of common pollutants. Poor air quality kills people. Worldwide, bad outdoor air caused an estimated 4.2 million premature deaths in 2016, about 90% of them in low- and middle-income countries, according to the World Health Organization (WHO).

Indoor smoke is an ongoing health threat to the 3 billion people who cook and heat their homes by burning biomass, kerosene and coal. Air pollution has been linked to higher rates of cancer, heart disease, stroke and respiratory diseases such as asthma.

On the concern of this we have made around 4 projects that will help control the air pollution as well as will help us in many different ways.

THINGS WE HAVE MADE

Air Exhaust

The device is an 8" iron or steel pipe that could be made to fit the exhaust pipe of the silencer. The pipe of 4" diameter is fitted with iron mesh on both ends. In between, the pipe is filled with activated charcoal (charcoal got on burning coconut shell) and coconut coir for 3" each.

Materials used

- **Steel wool:** Steel wool, also known as iron wool, wire wool, steel wire or wire sponge, is a bundle of very fine and flexible edged steel filaments. It was described as a new product in 1896. It is used as an abrasive in finishing and repair work for polishing wood or metal objects, cleaning household cookware, cleaning windows and sanding surfaces.
- **Activated charcoal:** Activated carbon, also called activated charcoal, is a form of carbon processed to have small, low-volume pores that increase the surface area available for adsorption or chemical reactions. Activated carbon is usually derived from charcoal. When derived from coal or corn it is referred to as activated coal. Activated coke is derived from coke.
- **Filter paper:** Filter paper is a semi-permeable paper barrier placed perpendicular to a liquid or air flow. It is used to separate fine substances from liquids or air. It is used in science labs to remove solids from liquids. This can be used to remove sand from water.

Uses

- It can be used within the silencer of bikes and car which releases air with lots of pressure and pollutants. Thus, the Air Exhaust will lower down the content of pollutants in the air.
- Also we can add a Turbine and a Dynamo to this model when it is used within the silencers, which can generate electricity and can store it in a battery. Thus, we can lower down the pollution level as well as generate electricity.
- This system can also be installed on the top of the factories or any other place in the factory from where the polluted air is being released in order to make that air less polluted.

Futuristic Car

- This car consists of many features which we have made by thinking in terms of safety. Some of the features are - Overloading Detector, Car Accident Location Tracker, Pulse Rate Monitoring Sensor, Lane Detector, Smart Security Camera, Crash Edge Detector, Power Wheel Control, Li-Fi communication, Omni Directional Wheel.
- All these features almost reduce the chances of accident to very low percentage also if in case the accident happens the accident location tracker will immediately inform the authorities for immediate help for health and medicines.
- Our prototype can also be run by an air battery which we have made with the help of our chemistry teacher. It consists of carbon rod, magnesium ribbon and a copper wire whose working is explained further.

- This car consists of many features related to our safety on the roads at very low-cost as compared to other cars. So, the people will be attracted towards this as we're providing multi-features at low-cost. So as this car is fully electronic with no issues of maintenance, people will like to change their normal petrol and diesel running car to our fully electronic car. Hence, the pollution level will decrease down to a very low level if everyone start using electronic cars.

Electric Bicycle

- An electric bicycle also known as an e-bike is a bicycle with an integrated electric motor, which can be used for propulsion. Many kinds of e-bikes are available worldwide, from e-bikes that only have a small motor to assist the rider's pedal-power to more powerful e-bikes which are closer to moped-style functionality. All retain the ability to be pedalled by the rider and are therefore not electric motorcycles.
- E-bikes use rechargeable batteries and the lighter ones can travel up to 25-32 km/h (16-20 mph), depending on local laws, while the more high-powered varieties can often do more than 45 km/h (28 mph).
- In some markets, such as Germany as of 2013, they are gaining in popularity and taking some market share away from conventional bicycles, while in others, such as China as of 2010, they are replacing fossil fuel-powered mopeds and small motorcycles.

Different modes of cycle

- **Solar Mode:** The term "solar vehicle" usually implies that solar energy is used to power all or part of a vehicle's propulsion. Solar power may be also used to provide power for communications or controls or other auxiliary functions.
- **Manual Mode:** Bicycles have a number of simple machines included in their wheels, pedals, gears and brakes that help the bike to move. When the rider balances on a bike, he does so according to the laws of physics. Even simpler parts like the frame of a bike take science into account.
- **Electric Mode:** An electric bicycle, also known as an e-bike is a bicycle with an integrated electric motor, which can be used for propulsion. Many kinds of e-bikes are available worldwide, from e-bikes that only have a small motor to assist the rider's pedal-power to more powerful e-bikes which are closer to moped-style functionality. All retain the ability to be moved by the rider and are therefore not electric motorcycles.
- **Dynamo:** We can attach a dynamo to the rotating wheels of the bicycle and then to the battery source through which the cycle can be operated. It will directly convert the energy by the rotating wheel into electrical and will store it in the battery. Running the bicycle on any of the above modes will generate electricity hence making the bicycle to run more on the battery.

Self-charging Electronic Vehicle

- As the name suggest 'Self-charging Electronic Vehicle' (SCEV) we get to know that this car is eco-friendly. This car runs on solar power during daytime but the actual game changer comes here that, What do we during night? The answer is it uses a self recharging technology with the help of piezoelectric plates, on every bump it recharges the second battery for night use and if we needed can charge the second battery with electricity also.
- As we can see that the number of cars are increasing day by day, which means more pollution. More pollution means destroying our Earth and ourselves also. The ultimate resolution for this is SCEV. It is a zero carbon emission car. Solar power is also a great way to reduce carbon footprint.
- This car model is based on the idea of reducing the carbon footprint around us. This car not only works on solar energy, from sun and electric energy but also works on piezoelectric plate. These plates have ability to generate electricity in response to applied mechanical stress. Since India is a country which mostly have enplane and bumpy roads, this will help in generating electricity while driving due to piezoelectric plates.
- This car has almost zero carbon efficiency, which will help in keeping our environment tidy and clean. Not only it can run during daytime but also during night as it has many options to charge.

Uses

- As we can see that number of cars are increasing day by day. By increasing rate of cars, pollution is also increasing. Car pollution is one of the major causes of global warming. Cars and trucks emit carbon dioxide and other greenhouse gases, which contribute one-fifth of the United States' total global warming pollution. Greenhouse gases trap

heat in the atmosphere, which causes worldwide temperatures to rise.

- Without greenhouse gases, the Earth would be covered in ice, but burning excessive amounts of fossil fuels, such as gasoline and diesel, has caused an increase of 0.6°C, or 1°F, in global temperatures since pre-industrial times, and this will continue to rise over the coming decades.
- Warmer global temperatures affect farming, wildlife, sea levels and natural landscapes. Children are at risk of dangerous levels of air pollution in cars because exposure to toxic air is often far higher inside than outside vehicles, a former government chief scientific adviser has warned.
- "Children sitting in the backseat of vehicles are likely to be exposed to dangerous levels [of air pollution]," said King. "You may be driving a cleaner vehicle but your children are sitting in a box collecting toxic gases from all the vehicles around you."

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Low-cost Solution to Air Pollution: Lilawati Vidya Mandir, Shakti Nagar, Delhi

Earlier the air we breathe is used to be pure and fresh. But, due to increasing industrialization and concentration of poisonous gases in the environment the air is getting more and more toxic day by day. Also, these gases are the cause of many respiratory and other diseases. Moreover, the rapidly increasing human activities like the burning of fossil fuel, firewood and other things that we burn produce oxides of carbons which are released into the atmosphere. Earlier there happens to be a large number of trees which can easily filter the air we breathe in. But with the increase in demand for land, the people started cutting down of trees which caused deforestation. That ultimately reduced the filtering capacity of the tree.

Moreover, during the last few decades, the numbers of fossil fuel burning vehicle increased rapidly, which increased the number of pollutants in the air.

Its causes include burning of fossil fuel and firewood, smoke released from factories, volcanic eruptions, forest fires, bombardment, asteroids, CFCs (chlorofluorocarbons), carbon oxides and many more.

Besides, there are some other air pollutants like industrial waste, agricultural waste, power plants, thermal nuclear plants, etc.

The air pollution has many bad effects on the health of people. It is the cause of many skins and respiratory disorder in human beings. Also, it causes heart disease too. Air pollution causes asthma, bronchitis and many other diseases.

"Air pollution in Delhi worsens to 'severe' category" – The Hindu Delhi's air quality nears 'severe' levels again; north-westerly winds, farm fires to blame

PM reviews pollution situation in North India – India News

All these are nothing but the news articles showing the worse conditions of Delhi's Pollution Levels. We all are aware of the bad conditions of Delhi Air. Some are blaming the burning of crackers for this, some are saying that this all is because of the burning of field in Haryana and Punjab commonly known as 'Parali', and some are targeting the use of vehicles for this.

Although the level of air pollution has reached a critical point. But, there are still ways by which we can reduce the number of air pollutants from the air.

Reforestation – The quality of air can be improved by planting more and more trees as they clean and filter the air.

Policy for industries – Strict policy for industries related to the filter of gases should be introduced in the countries. So, we can minimize the toxins released from factories.

And the Government of Delhi is applying "Odd-Even" for cars to prevent for being more pollution.

But all this is not enough. No one is trying to solve the problem of pollution, no one is trying to deal with the already existed pollution. Everyone is taking about only of "how to stop generating more pollution" than "how to end pollution"!

So, what is to be done to end the pollution at an affordable cost? For this our "SOLLUTION TO POLLUTION" is here. You must have heard people saying. "The pollution will be removed after rain". So, we did a research over this and come to the conclusion that it actually works. This is how acid rain is formed. Acid rain is a result of air pollution. When any type of fuel us burnt, lot of different chemicals are produced. The smoke that comes from a fire or the fumes that come out of a car exhaust don't just contain the sooty grey particles that you can see – they also contain the sooty grey particles that you can see – they also contain lot of invisible gases that can be even more harmful to our environment.

Power station, factories and cars all burn fuels and therefore they all produce polluting gases. Some of these gases (especially nitrogen oxides and sulfur dioxide) react with the tiny droplets of water in clouds to form sulfuric and nitric acid. The rain form these clouds then falls as very week acid- which is why it is known as "acid rain". This makes the air clear but the water acidic. The reaction involved is:

$$SO_2(aq) + H_2O(I) \rightarrow H_2SO_3(aq)$$

Yes, our model works on this concept only. It consists of a vertical column having inlet air fans and one exhaust

at the top. The inlet fans suck the air around in and push this air upward in the vertical column further, a water pump pulls the water from the bucket and sprinkle it in high pressure in the vertical column to create a mist.

By this, air particles are made to mix with the water. The tiny water droplets of the mist easily react with the particles in the air, which results in the removal of oxides of sulfur and nitrogen. These oxides are the main reasons of the burning sensation in our eyes. The mist created will have very tiny droplets of water which can even remove the PM 10 particles to some extent. After this, the air passes through the Demister which traps the water droplets present in the air. This traps the water due to the adhesive force of water. The water sticks to the Demister forming heavy droplets, which falls down in the bucket due to gravity. This is how our model works and the same water is reused and the cycle continues.

This is just a prototype and very effective at such a low cost. We can simply use solar panels to power our pump and fans. "it is cheap at the peak." This concept can further be extended by using sensors in it and making a system which automatically sends a message to us when the water becomes much acidic; so, we can easily change the water at correct time. We are working on this system. We can also add some potassium hydroxide (KOH) in the water which is a very good absorbent of 'Carbon dioxide' and will help removing excess carbon dioxide from the air. With certain reactions KOH can be recovered back to make the process cost effective. This concept can be used near traffic lights in the form of tall towers to purify the air there, and we are looking forward to use this even in the exhaust pipes of vehicles, On prior consultation with an automobile engineer.

So, this was the effort of our school's team to solve the alarming problem of pollution at some extend consuming very less money with the use of simple physics.

If we are able to remove even a bit of pollution, it will be an achievement for us because we are making our **"Solution to Pollution"** at a very low cost. We can further make even more effective by adding various components like charcoal filter, etc., but this all will affect the cost of product.

■■■■

Physicians Need More Time with Their Patients

Physicians need more time with their patients to consider the psychosocial aspects of health problems, according to the President of the World Medical Association (WMA), Dr Miguel Jorge. Speaking at a WHO meeting in Muscat, Oman on noncommunicable diseases (NCDs) and mental health, Dr Jorge said that medical education and training placed a strong emphasis on the biological aspects of diseases and their treatment. "But, particularly for NCDs and mental health, there is a need for physicians to take into consideration the psychosocial aspects affecting their patients", he said. "The physician-patient relationship requires enough time at each contact to allow for a comprehensive person-centered approach – and that often means more time than is usually provided." (*WMA*)

Poor Nutrition is Increasing Rates of Diabetes, Cancers, Heart Attacks and Stroke

Malnutrition, in all its forms, is negatively impacting the health, well-being and sustainable development of people of all ages in WHO's Eastern Mediterranean Region, particularly in those countries affected by conflict in which people are experiencing high levels of food insecurity, undernutrition and micronutrient deficiencies.

WHO is calling on governments to take action to improve nutrition, to reduce the burden of diet-related NCDs, and reduce undernutrition associated with conflict and political instability. At the global meeting on NCDs and mental health in Muscat, Oman, WHO launched a regional nutrition strategy to help countries meet global nutrition-related targets, achieve food security, end all forms of malnutrition and improve nutrition throughout the life course by 2030… (*WHO/EMRO*)

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Low-cost Solution to Air Pollution: Mount Abu Public School, Sector-5, Rohini, New Delhi

As the air quality index (AQI) of Delhi is reaching heights, so we being a concerned citizen have come up with a solution to adsorb the pollution using low-cost charcoal tiles, which can even be prepared from the waste such as (peanut shells, walnut shells, coconut husk, etc.)

The Heart Care Foundation of India (HCFI) gave us a platform to showcase our model, so that our combined effort can help Indians get relief from rising pollution level.

SCIENCE AND TECHNOLOGY REDUCING POLLUTION

Science and technology is a topic that encompasses science, technology and the interactions between the two. Science is a systematic enterprise that builds and organizes knowledge in the form of explanations and predictions about nature and the universe.

Technology is the collection of techniques, methods or processes used in the production of goods or services or in the accomplishment of objectives, such as scientific investigation or any other consumer demands.

IMPROVING HEALTH

The old dictum, *Cleanliness is next to godliness*, attributed to the theologian and philosopher Saint Thomas of Aquinas may ring hollow in the ears of many in the world today, to whom access to appropriate sanitation and safe drinking water is denied.

During St Thomas; lifetime' about 800 years ago, godliness was the highest moral virtue to which believers aspired; and cleanliness of the body and the spirit was next.

In this day and age of globalization however, where some highly educated, trained and skilled physicians reportedly still do not bother to wash their hands after touching one infected wound or contaminated object, before they go to touch the next patient; it seems hard to decide whether cleanliness is a virtue or a vice, or both; and where it sits in relation to godliness, or whatever has replaced godliness.

INTRODUCTION

Our basic aim to produce an eco-friendly charcoal that offers a great help in eradicating the pollution from our country and even other places of the world if desired.

Making of Charcoal

Charcoal is made by burning the **coconut husks, peanut shells, walnut shells** and some of the waste blocks of wood in an incinerator, i.e., a closed container so that the gases do not go out in the environment.

Placing the Tiles in Industrial Area

Large sized charcoal tiles could be placed in metropolitan cities at the places near traffic jams metro lines, on the mouth of chimneys, near the factories, etc.

Charcoal Used

The charcoal made is the activated one and people compare it with the briquettes used in barbeque grills. basically, the **activated charcoal increases the surface area of adsorption** of the pollutants. The type of adsorption taking place is physisorption.

MINI POLLUTION LEVEL DETECTOR

The sensors used are:

MQ-7

For detecting the level of **carbon monoxide**.

MQ-4

For detecting the level of **methane gas** in air.

MQ-135

For detecting the **AQI** in the air.

Moreover, software including **Arduino** UNO is used for coding purposes.

SUMMARY

Our Delhi city is again in the headlines for its worst time of the year. It is solemnly our duty to help it coming away from evil hands of the pollution.

Basically, our idea includes the working of activated charcoal based on its great property of **adsorption** in general adsorption is a surface phenomenon, i.e., absorption takes place from the surface itself. **Activated charcoal adsorbs pollutants** up to a great extent and help create a healthy environment. You will get to know about its adsorbing ability and methods to dispose the waste.

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Indian Journal of Clinical Practice, Vol. 30, No. 8, January 2020

Low-cost Solution to Air Pollution: Evergreen Public School

MY FRIENDS, WHAT IS POLLUTION?

Pollution refers to the substances that are added to the environment which alter it's natural composition. Nowadays, the most disastrous and rapidly spreading pollution is air pollution. It has engulfed many cities throughout the globe like Delhi and Beijing. It has affected the lives of millions of people.

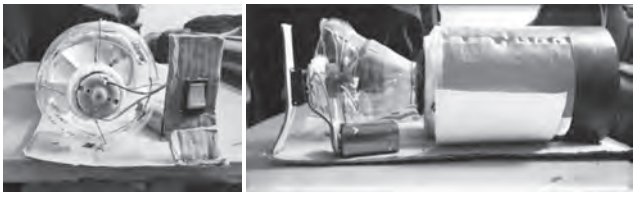
This is a big threat not only for India or any other country, but also a common threat for the whole world. Any solution by a country cannot alone help to face this natural devil. The thing required is a large scale common solution which is to be done by all the countries and it is also necessary that it is done together.

Today the major pollutant in India is the Suspended Particulate Matter (SPM) are composed of liquid aerosol particles that are suspended in air. Their size varies from 2.5 micron which is better known as PM 2.5-10 microns is known as PM 10. They are too small to be seen from naked eyes but present everywhere. This SPM travel through our nose and reach our lungs via inhaled air and causes various respiratory problems.

SPM is produced every time when we do tobacco smoking, burning of fuels operation of high emission vehicles, use of old heavy duty vehicles, bursting of volcanoes, dust storms and there are many more but these are the major ones.

SPM has disastrous effects on our body which are severe problems and irritation in eyes, burning sensation in nose and throat, development of chronic lung diseases, chances of asthma attacks in young children and premature death in people with heart and lung problems.

To minimize the effects of this pollution, we can use some simple preventions which are to stay indoors that are areas with less polluted air. Make sure that we sleep in a room with filtered air. Buy an air purifier which belongs to a well-known certified company. Even if go outdoors must use masks like N-95 or P-100. If we want to go out, we must spend time in parks or gardens to get oxygen rich air.



Front view Side view

So now let's move on to our self-made low-cost air purifier. The major parts and elements of the model are - Spun/Sediment filter cartridge which is made up of polypropylene fibers. It is said to be replaced after every 3 months in a RO water purifier. The model also has holes for the intake of air. The body of the model is made up of used plastic bottles, exhaust motor who's propeller is self-made up of Pepsi can, 9 volt DC battery, wires and switch.

Main mechanism behind the functioning of the model is that water contains dirt and dust particles just like that in air, which cannot be seen with naked eyes. So, the external spun/sediment cartridge of water purifiers filters them up. If the filter cartridge can filter dust from water then it can also surely filter the dust from air.

We have sealed one end of the cartridge and attached the exhaust motor on the other end in such a manner that when we will switch on the motor, then it will create low pressure in the cartridge and the air from outside will rush in through the walls of the cartridge and dust particles will get deposited on the upper layer of the cartridge, thus get filtered. This is low-cost solution for removing the PM 10. While making this model we had minimal expense of less than 50 rupees as all the things used in designing this structure was recycled by us.

We hope that this idea will be useful as it is very light portable and very low-cost. Scientist have declared that a day will come when we would have to carry oxygen cylinders and masks. So rather than carrying those heavy cylinders, we can carry these cheap, small but useful devices. This is just a small and basic prototype of our imagination. With your support and proper resources, we will create a better and efficient masterpiece.

Thank you!

■■■■

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Medtalks with Dr KK Aggarwal

Air Pollution Tied to Hospitalizations for Wide Range of Illnesses

Older adults who are exposed to tiny particles in air pollution for just a day or two are more likely to be hospitalized for a wide variety of common health problems, a US study suggests. Researchers focused on PM 2.5, a mixture of solid particles and liquid droplets smaller than 2.5 μm in diameter that can include dust, dirt, soot and smoke. They confirmed previously-known links between short-term exposure to PM 2.5 and an increased risk of hospitalization and death from heart and lung diseases, diabetes and clots in the large veins of the legs. They also found new links between short-term exposure and increased hospitalizations for conditions ranging from sepsis to kidney failure… (*Reuters*)

AMRIT Pharmacies in India

The AMRIT (Affordable Medicine and Reliable Implants for Treatment) scheme aims to reduce expenditure incurred by patients on treatment of cancer and cardiovascular (heart) diseases to make health care affordable for poor. Under it, retail outlets in the name of AMRIT Pharmacy are opened to sell drugs for cancer and heart diseases at highly discounted prices than the market rates. The project is implemented by government owned HLL Lifecare Ltd (HLL) which is deputed to establish and run AMRIT chain of pharmacies across the country. At the AMRIT outlets, 202 cancer and 186 cardiovascular drugs will be available at reduced rate of 60-90% compared to market rates. AMRIT Pharmacy outlets are generally setup in AIIMS, Government Medical College Hospitals, Government Colleges and District Hospitals, which have about 300 beds.

For example, in Delhi they are set up at AIIMS, RML, LHMC, Safdarjung Hospital, Charak Palika Hospital, Centre of Dental Education and Research (CDER), and National Cancer Institute. In total, 172 pharmacies have been opened so far in India. In the private and social sector, we have similar model in "Dawaa Dost Pharmacy Chain" in Rajasthan.

Anemia Management in Semi Urban Set Up in India

Just check hemoglobin (Hb), if low, look for rise in Hb after 2 weeks of alternate day oral iron before investigating further.

As per the National Family Health Survey (NFHS)-IV (20015-16), 54.2% women (15-49 years) and 59.5% children (6-59 months) in rural India are anemic.

The most common cause of anemia is iron deficiency caused by inadequate dietary iron intake or absorption, increased needs for iron during pregnancy or growth periods, and increased iron losses as a result of menstruation and helminth (or intestinal worms) infestation.

On 8th December, 2019, a health camp was organized at Mera Clinic, Kotla Mubarakpur in Delhi. At the camp, 100 women were screened for Hb and the reports showed that more than 90% of the females had Hb levels below 12. These results were in consonance with the data seen in the NFHS-IV. We provided free albendazole to the women and recommended them to start oral iron.

We are all aware that regardless of the presence of symptoms, all patients with iron deficiency anemia and most patients with iron deficiency without anemia should be treated.

It is imperative to identify and address the cause of iron deficiency, especially in adults with new onset iron deficiency. In a camp set up, most people come for free treatment, hence sending them for investigations may not be feasible. In such kind of community outreach, the best approach is to start with oral iron with a follow-up Hb check in 2 weeks. At the end of this period, if there is no rise of Hb, they should be investigated to identify other causes of anemia.

In routine clinical practice, we treat patients with severe, severely symptomatic (with symptoms of myocardial ischemia), or life-threatening anemia with red blood cell (RBC) transfusion. In addition, in a rural or semi urban set up, we do not offer IV iron in nonpregnant females, unless the patient has inflammatory bowel disease, gastric surgery or chronic kidney disease. However, in rural set up, owing to the ease of administration of oral iron, we treat patients who have uncomplicated iron deficiency.

In most of the cases, oral iron is as efficient as IV formulation. For individuals treated with oral iron, the preferred dose is recommended to be taken every alternate day rather than a daily dose.

This is based on evidence that in individuals with iron deficiency, the alternate day dosing has been shown to improve absorption and reduce gastrointestinal side effects. Some individuals may reasonably choose every-day dosing if they find that it improves tolerability or ease of use.

Effective treatment of iron deficiency results in resolution of symptoms, a modest reticulocytosis (peaking in 7-10 days), and normalization of the Hb level in 6-8 weeks.

An effective regimen for the treatment of uncomplicated iron deficiency with oral iron preparations should lead to the following responses:

- If pica for ice is present, it disappears almost as soon as oral iron therapy is begun, well before there are any observable hematologic changes.
- The patient will note an improved feeling of well-being within the first few days of treatment.
- The Hb concentration will rise slowly, usually beginning after approximately 1-2 weeks of treatment and will rise approximately 2 g/dL over the ensuing 3 weeks. The Hb deficit should be halved by approximately 1 month, and the Hb level should return to normal by 6-8 weeks.
- Typically, papillation of the tongue is decreased in patients with iron deficiency and can be used as a gauge of duration of symptoms. Classically, loss of papillae begins at the tip and lateral borders and moves posteriorly and centrally. Following iron repletion, a rapid correction (weeks to months) is observed.

For patients receiving oral iron, we often re-evaluate the patient 2 weeks following the initiation of the dose.

Our recommendation

- The recommended daily dose for the treatment of iron deficiency in adults is 150-200 mg of elemental iron daily. A 325 mg ferrous sulfate tablet contains 65 mg of elemental iron per tablet; three tablets per day will provide 195 mg of elemental iron, of which approximately 25 mg is absorbed and used in production of heme and other molecules.
- We prefer alternate-day dosing (taking the iron every other day rather than every day) for better iron absorption than daily dosing. The patients can follow M-W-F approach **M**onday-**W**ednesday-**F**riday.
- We give 1-3 tablets (65-200 mg) based on patient preference and tolerance.

Simple Aspirin as Good as Newer Drugs for Aborting or Preventing Acute Migraine Attack

Old aged aspirin is as effective for acute treatment and prevention of recurrent migraine attacks as more expensive medications.

A review of randomized trials suggests that high-dose aspirin is effective and safe for acute migraine and that low-dose aspirin may help prevent migraine attacks. The study was published online on October 12 in the *American Journal of Medicine*.

Migraine affects an estimated 14% of the general population and is more prevalent in women (18%) than men (9%). About 90% of migraine patients report moderate-to-severe pain associated with their attacks. More than 50% report severe impairment, which often results in reduced work and school productivity.

The study assessed randomized trials and meta-analyses in which participants received 900-1200 mg of aspirin for acute migraine or 81-325 mg daily for prevention of recurrence. High-dose aspirin was more effective than placebo in multiple trials that examined relief of acute migraine attacks. Efficacy was comparable to other medications, including 400 mg ibuprofen or 50 mg sumatriptan. However, while migraine relief is comparable for 900-1200 mg aspirin and 100 mg sumatriptan, the researchers note that sumatriptan provides faster relief. Overall, 81-325 mg aspirin daily may be an effective and safe treatment option for the prevention of recurrent migraine headaches.

Duke Doctors Successfully Transplant Heart after Cardiac Death

A potential organ donor is typically a mechanically ventilated patient in an ICU with brain death (donation after brain death or DBD) or cardiac death (donation after cardiac death or DCD). Nearly all heart donations are DBD and there has been very limited experience with DCD. Duke University Hospital in Durham, North Carolina team has recently transplanted heart using DCD.

The team used the TransMedics Organ Care System (OCS) to perfuse the heart, which had stopped beating, with warm blood after it had been procured. The heart then remained on the OCS until it was transplanted into the recipient.

Resuscitating organs is a key component in the evaluation and potential use of DCD. For hearts, this involves resuscitating and then excising a donor heart after cardiac arrest. Case series in Australia and England have demonstrated the potential utility of using this type of cardiac donor. There have now been

over 100 DCD heart transplants worldwide. DCD is the "next evolution" in heart transplantation methods, although it has been used for many years in procuring other organs such as lungs, liver and kidneys.

In children, Donation after circulatory determination of death (DCDD) refers to a donor that does not meet criteria for brain death, but has no hope of any sort of meaningful neurologic recovery, and in whom the family chooses to withdraw life-sustaining treatment. After death is determined using circulatory criteria (permanent absence of respiration, circulation and responsiveness), organs may be recovered for transplantation. This type of donation has previously been referred to as non-heart-beating organ donation (NHBD) or DCD.

Standard Treatment of Diabetic Nephropathy (eGFR >30): ACE Inhibitor or ARB *plus* SGLT-2 Inhibitor

Diabetic nephropathy or overt proteinuria (macro-albuminuria, or "severely increased albuminuria") is usually presented with worse glycemic control, hypertension, glomerular hyperfiltration or in patients with a genetic predisposition. The earliest clinical manifestation of renal involvement in diabetes is an increase in albumin excretion (microalbuminuria, or "moderately increased albuminuria").

Glycemic control can partially reverse the glomerular hypertrophy and hyperfiltration, delay the development of elevated albumin excretion, stabilize or decrease protein excretion in patients with increased albumin excretion, and can slow the progression of glomerular filtration rate (GFR) decline.

Angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) can reduce the rate of kidney disease progression. But, do not combine the two. Also, do not combine aliskiren, a direct renin inhibitor, with ACE inhibitors or ARBs.

In diabetic nephropathy with estimated GFR (eGFR) >30 mL/min/1.73 m^2 - add SGLT-2 inhibitor like canagliflozin or empagliflozin. They can reduce kidney disease progression, end-stage renal disease and cardiovascular events and can potentially improve survival.

Ultra-processed Foods can Cause Diabetes

Food which has been significantly changed from its original state, with salt, sugar, fat, additives, preservatives and/or artificial colors added is termed as ultra-processed food. Ultra-processed foods like candy, soft drinks, pizza and chips do not contain enough of the beneficial nutrients that the body requires.

Unprocessed or minimally processed foods: Vegetables, grains, legumes, fruits, nuts, meats, seafood, herbs, spices, garlic, eggs and milk.

Processed foods: When ingredients such as oil, sugar or salt are added to foods and they are packaged, the result is processed foods. Examples are simple bread, cheese, tofu, and canned tuna or beans. These foods have been altered, but not in a way that's detrimental to health.

Ultra-processed foods: These foods go through multiple processes (extrusion, molding, milling, etc.), contain many added ingredients and are highly manipulated. Examples are soft drinks, chips, chocolate, candy, ice-cream, sweetened breakfast cereals, packaged soups, chicken nuggets, hot dogs, fries and more.

High consumption of these ultra-processed foods is associated with an increased risk of type 2 diabetes, independent of other risk factors, including weight and nutritional quality of the diet, a new study indicates.

Ultra-processed food consumption has previously been linked to increased risks of cancer, cardiovascular diseases, mortality, depressive symptoms and metabolic disorders.

The study published online in *JAMA Internal Medicine* involved 1,04,707 participants in the ongoing, web-based NutriNet-Santé study in France.

Rates of type 2 diabetes among the lowest and highest ultra-processed foods consumers were 113 and 166 per 1,00,000 person-years, respectively.

Over a median follow-up of 6 years, the consumption of ultra-processed foods was found to be associated with a significantly higher risk of type 2 diabetes, with a hazard ratio (HR) of 1.15 for each 10% increase of ultra-processed foods in the diet. Physical and chemical processes, such as high-temperature heating are associated with the production of contaminants posing health risks, such as acrylamide, found mainly in fried potatoes, biscuits, cakes and coffee, which have been associated with insulin resistance.

Ultra-processed foods usually go through several physical and chemical processes such as extruding, molding, pre-frying (or) hydrogenation, possibly leading to the production of new compounds with potential cardiometabolic disruption properties.

They also typically contain food substances of no or rare culinary use (some varieties of refined sugars, hydrogenated oils) and various types of cosmetic additives (emulsifiers, sweeteners, thickening agents, colorants), with cardiometabolic effects postulated for some.

Two Drugs Better Than One in Severe Flu: Time for CMAAO Countries to Use Favipiravir

The addition of the drug favipiravir is effective in the treatment of Ebola and Nipah. Favipiravir in the treatment of severe influenza virus infections can save lives. Its time for the DCGI to approve this drug and Indian Pharma companies to launch it in India and neighboring countries. India is already introducing the Ebola Awareness Program in the country.

Taking two antivirals — favipiravir (Avigan, Toyama Chemical) and oseltamivir are more effective for treating severe influenza than taking oseltamivir alone, according to a comparison of results from two clinical trials published online on December 11 in the *Journal of Infectious Diseases*.

Each year, approximately 3,00,000-6,50,000 people die from seasonal influenza. The only drug oseltamivir, is of limited use, and its efficacy for severe cases has not been adequately studied. Adding an antiviral that works by a different mechanism might boost effectiveness, especially for the most compromised patients.

Favipiravir works differently from oseltamivir, targeting a viral RNA polymerase rather than the neuraminidase. The patients received oseltamivir 75 mg for 10 days and either of two regimens of favipiravir (1,600 mg b.i.d. on day 1 and 600 mg b.i.d. on days 2-10, or 1,800 mg b.i.d. on day 1 and 800 mg b.i.d. on days 2-10).

On day 14, clinical improvement was greater among the patients who received both drugs. In addition, the proportion of patients with undetectable viral RNA at day 10 was higher in the combination group than in the monotherapy group.

(Source Medscape)

Top 11 Medical Updates in 2019

1. A World Heath Organization (WHO) report has shown that the confirmed cases of measles have increased from 716 in 2018 to 2,719 in the first 11 months of 2019 in Turkey. Out of the 2,719 confirmed cases, some 1,800 were children under 5 years of age, with over 900 unvaccinated children.
2. There is a growing tension between two approaches in medical research: the effort of finding treatments that are consistently effective in large populations versus the notion of "precision medicine, which favors therapy that we closely tailor to an individual's very personal needs.
3. In March this year, experts affiliated with the European Resuscitation Council by analyzing the data of more than 60,000 people, saw that nifedipine, appeared to increase the risk of sudden cardiac arrest.
4. A study, appearing in *JAMA Internal Medicine* in June, found that anticholinergic drugs may increase a person's risk of developing dementia. The research from the University of Nottingham in the United Kingdom looked at the data of 58,769 people with and 2,25,574 people without dementia.
5. In August, the Food and Drug Administration (FDA) issued a warning against an allegedly therapeutic product available online sold under the names Master Mineral Solution, Miracle Mineral Supplement, Chlorine Dioxide Protocol or Water Purification Solution that contained no less than 28% sodium chlorite, an industrial bleach.
6. A study in the *New England Journal of Medicine* in July, which involved around 1.3 million people, suggested that, when it comes to predicting the state of a person's heart health, both blood pressure numbers are equally important. The study found that older individuals with lower systolic blood pressures actually faced a 40% higher risk of death than peers with elevated blood pressure values.
7. Research in the *Journal of the American Heart Association* in August, showed that people who adhered to plant-based diets had a 32% lower risk of death (also 25% lower risk of all-cause mortality).
8. A study from April in the journal *Nutrients* warned that people who follow a ketogenic diet may experience blood vessel damage.
9. According to Google Trends, some of the top searches in the United States this year included intermittent fasting diets, the Noom diet and the 1,200 calorie diet.
10. An intriguing study in *Nature Metabolism* in May, pointed that muscle building protein shakes, contain mostly whey proteins, which have high levels of the essential amino acids leucine, valine, and isoleucine. In mice, a high intake of these amino acids led to overtly low levels of serotonin in the brain. It also led to obesity and a shorter life span.
11. A WHO study appearing in the *Lancet* in January took into account the findings of 185 observational studies and 58 clinical trials, covering almost 40 years, concluded that to lower their death risk, as well as the incidence of coronary heart disease, stroke, type 2 diabetes and colon cancer, a person should ideally consume 25-29 g of fiber per day.

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News and Views

Ticks and Tick-borne Diseases: New Diseases to Revisit in 2020

Ticks and tick-borne diseases are increasingly becoming a major health concern for humans, domesticated animals, and livestock. More than 90% of the nearly 60,000 cases of nationally notifiable vector-borne diseases reported in 2017 were linked to ticks.

Invasive tick species are being discovered, new tick-borne pathogens are emerging, and co-infections in ticks are surging. Rising global temperatures, ecologic changes, reforestation and increases in commerce and travel are all important underlying factors influencing the rate and extent of range expansion for ticks and tick-borne pathogens.

Indian tick typhus (ITT), first recognized in 1917 in India, is caused by Rickettsia conori, earlier reported sporadically from mountainous and forested areas and now reported from many parts of the country.

In India, the fatal tick-borne viral diseases, viz., Crimean-Congo hemorrhagic fever (CCHF) and Kyasanur Forest disease (KFD) were caused by ticks of *Hyalomma anatolicum* and *Haemaphysalis spinigera*.

KFD is a re-emerging disease discovered in 1957 from Shimoga district of Karnataka state; however, in recent years it has moved its territory to seven districts of the state as well as centripetally spread to neighboring Kerala, Goa and Maharashtra states which are sharing borders with the state.

CCHF, an emerging disease, was first reported from Gujarat in 2011; however, in recent years, cases were recorded from Rajasthan and Uttar Pradesh states.

There are sporadic records available for the occurrence of other tick-borne diseases, viz., relapsing fever, lyme disease, Ganjam virus disease and Q fever from various parts of the country time to time.

WHO Unveils Plan to Tackle Rising HIV Drug Resistance in Africa

Growing resistance to HIV drugs in Africa is threatening the significant progress made in the global fight against the virus. In an effort to reinforce the gains and end the AIDS epidemic by 2030, the World Health Organization (WHO) and partners unveiled a 5-year plan to monitor, prevent and respond to drug resistance.

WHO developed the Regional Action Plan which outlines systems to monitor HIV drug resistance indicators and how to use them at clinic and program level to minimize drug resistance and develop evidence-based quality improvement for antiretroviral medicine (ARV) programs (*WHO*).

FDA Authorizes Marketing of Diagnostic Test That Uses Novel Technology to Detect MRSA Bacteria

The US Food and Drug Administration (FDA) has authorized marketing of a new diagnostic test based on bacterial viability and novel technology to detect methicillin-resistant *Staphylococcus aureus* (MRSA) bacterial colonization, a widespread cause of hospital-acquired infections.

The cobas vivoDx MRSA diagnostic test may allow health care professionals to evaluate patients for colonization with MRSA bacteria more quickly than traditional culture-based techniques when such testing is needed… (*FDA*)

Brushing Your Teeth could be Good for Your Heart

People who brush their teeth three times a day are less likely to develop atrial fibrillation or heart failure than those with less consistent oral hygiene habits, a Korean study suggests.

Researchers examined data on 1,61,286 people with national health coverage and no history of atrial fibrillation, heart failure or other cardiovascular diseases. After following at least half for about 10.5 years, a total of 4,911 people, or 3% of the study population, developed atrial fibrillation and 7,971 people, or 4.9%, developed heart failure. Individuals who brushed their teeth three times a day were 10% less likely to develop atrial fibrillation and 12% less likely to develop heart failure compared to those who brushed less frequently, the study found… (*Reuters*)

Norovirus Forces NHS England to Close 1,100 Hospital Beds

Hospitals in England have had to shut more than 1,100 beds because of a serious outbreak of the norovirus winter vomiting bug.

That is almost double the number that were closed for the same reason this time last year. The number of cases

of norovirus in mid-November was 28% higher than the average for the time of year over the past 5 years. Prof Steve Powis, NHS England's Medical Director, said: "We've already seen a number of hospitals and schools affected by norovirus, and unfortunately instances like these are likely to rise over the coming weeks." (*The Guardian*)

Kids Who Snack may have Better-Quality Diets

Children who eat between meals may be getting fruits and other elements of a healthy diet that they would not otherwise eat, a small study of kids' diet quality suggests.

Researchers examined data on eating habits among 150 families in Minneapolis-St. Paul, Minnesota, with children 5 to 7 years old. When researchers only looked at meals kids ate, children had an average so-called Healthy Eating Index (HEI) score of 55.3 out of a possible 100 points for an optimal diet, the study found. But when researchers also looked at snacks, kids' average scores rose to 57.1. The findings were published in the *Journal of the Academy of Nutrition and Dietetics*.

Less Invasive Approach as Good as Surgery for Achalasia

In idiopathic achalasia patients, a less invasive procedure proved equal to a surgical approach in controlling symptoms at 2 years but resulted in more cases of gastroesophageal reflux, according to an international randomized trial.

Investigators compared the efficacy of per oral endoscopic myotomy (POEM) with laparoscopic Heller's myotomy (LHM) plus Dor's fundoplication and found POEM to be noninferior in the study's primary endpoint. At 2-year follow-up, clinical success – defined as an Eckardt symptom score of 3 or less with no additional treatments – was observed in 83.0% of POEM patients and 81.7% of LHM patients (95% confidence interval [CI] –8.7-11.4, p = 0.007 for noninferiority). The findings were published online in the *New England Journal of Medicine*.

Occupational Pesticide Exposure Linked to CVD

High levels of exposure to pesticides are positively associated with cardiovascular disease (CVD) incidence, research based on the Kuakini Honolulu Heart Program (HPP) suggests.

The longest longitudinal study of occupational pesticide exposure among more than 7,500 Japanese-American men showed a significant association between incident CVD and pesticide exposure after 10 years of follow-up. The study was published in the *Journal of the American Heart Association*.

WHO Global Meeting to Accelerate Progress on SDG Target 3.4 on NCDs and Mental Health

The WHO is organizing the Global Meeting to Accelerate Progress on Sustainable Development Goal (SDG) Target 3.4 on Noncommunicable Diseases (NCDs) and Mental Health. The Meeting is being hosted by the Government of the Sultanate of Oman from December 9 to 12, 2019 in Muscat. The overarching goal of the Global Meeting is to accelerate the implementation of national responses to address NCDs and mental health conditions with a view to reduce premature mortality and scale up interventions to reach SDG target 3.4 by 2030… (*WHO*)

Malaysia Reports First Case of Polio Since 1992

A 3-month-old Malaysian infant has been diagnosed with polio, the first case reported in the country in nearly three decades, a top health official said.

The baby boy from Tuaran in Malaysia's Sabah state on Borneo island tested positive for polio after being admitted to hospital with a fever and muscle weakness, Director General of Health Noor Hisham Abdullah said in a statement.

Malaysia was declared polio-free in 2000, after reporting its last known case of the disease in 1992. Its resurgence comes just months after the Philippines, north of Borneo, reported its first cases of polio since 1993 in September… (*Reuters*)

Vaccine Group Announces Creation of Ebola Vaccine Stockpile

The vaccine alliance GAVI announced it would invest USD 178 million to create a global stockpile of about 5,00,000 Ebola vaccines, a move health officials say could help prevent future outbreaks from spiraling out of control.

GAVI is a public-private partnership that includes the WHO, UNICEF, the Bill and Melinda Gates Foundation and the World Bank, among others. The funding announcement was made after a meeting of GAVI's Board in New Delhi… (*ET Healthworld – PTI*)

Respiratory Health Improves Quickly with Better Air Quality

Improvements in environmental air quality result in quick and dramatic health benefits, according to a new

literature review published on December 6 in the *Annals of the American Thoracic Society*.

Researchers with the Forum of International Respiratory Societies Environmental Committee reviewed studies that assessed the impact of air quality interventions on health outcomes and how long it took to achieve these outcomes. "Within a few weeks, respiratory and irritation symptoms, such as shortness of breath, cough, phlegm and sore throat disappear; school absenteeism, clinic visits, hospitalizations, premature births, cardiovascular illness and death, and all-cause mortality decrease significantly," write lead author Dean E Schraufnagel, MD, from the University of Illinois at Chicago, and colleagues.

Long-duration Vancomycin Linked to Lower Rates of *C. difficile* Recurrence in IBD

In patients with inflammatory bowel disease (IBD), a long course of oral vancomycin is associated with lower odds of *Clostridioides difficile* infection recurrence than a short course, a retrospective chart review suggests.

The study included 134 patients who had at least one positive *C. difficile* toxin assay by polymerase chain reaction between 2010 and 2016. Long-duration (LD) vancomycin was defined as 21-42 days, and short-duration (SD) as 10-14 days. Those taking LD vancomycin had a 1.8% incidence of *C. difficile* infection recurrence, compared with 11.7% in the SD group (odds ratio [OR], 0.13). Multivariate logistic regression models showed that treatment with LD vancomycin had lower odds for recurrence than SD vancomycin (OR, 0.03). The findings are reported in the *American Journal of Gastroenterology*.

Breaking Trial: Medications as Effective as Stents or Bypass for Stable Heart Blockages

The ISCHEMIA trial, a new study reported at November's American Heart Association meeting, suggests that for most, managing heart blockages with optimal drugs alone is as safe and effective as putting a stent or doing a bypass surgery.

The trial followed over 5,000 patients with significant narrowing in one or more heart arteries. Half of the patients were randomly selected to receive optimal medical therapy (OMT) and lifestyle changes. The other half were given OMT and also sent for cardiac catheterization or a bypass surgery.

The group that received stent reported greater relief of angina, or chest pain but, there was no significant difference between the two groups in terms of rates of heart attack, death or hospitalization for worsening heart pain.

OMT makes more sense because it addresses all the arteries in the heart, not just the small section of narrowing addressed by a stent that may be causing angina. However, stents remain effective at relieving angina in patients who continue to experience symptoms despite being on appropriate medicines.

Unlike unstable angina, patients with stable angina have more predictable, chronic symptoms that can be managed with medications. Stable angina worsens with exertion or sometimes with emotional stress, and improves with rest. Reduction of stable angina involves improving the mismatch between oxygen supply and demand. This can be accomplished either by lowering demand or improving supply.

Demand can be reduced with optimal drug therapy, which may include β blockers, which slow down the heart rate or nitroglycerin, which decreases the work of the heart by relaxing blood vessels. Statins and aspirin are another important components as they help to stabilize the blockage.

WHO Gets New Advice on Curbing Deadly Noncommunicable Diseases

World leaders and health experts have handed 8 recommendations to WHO's Director-General, Dr Tedros Adhanom Ghebreyesus, that could save millions of lives and promote mental health. The WHO Independent High-level Commission on NCDs was convened by Dr Tedros in October 2017 to identify innovative ways to curb the world's leading causes of death: CVDs, cancers, diabetes, respiratory diseases and mental health conditions.

The Commission highlighted that NCDs still account for more than 70% of deaths and stressed that, "progress against NCDs and mental health conditions must be greatly accelerated if the 2030 Agenda is to succeed." (*WHO*)

Children Conceived from Frozen Embryos at Increased Risk for Certain Cancers

When frozen embryos are used during *in vitro* fertilization (IVF), the resulting children have a slightly higher risk than other kids for certain types of cancer, evidence from Denmark suggests.

Analyzing health records of more than a million Danish children, researchers found that babies conceived through assisted reproduction involving frozen embryo transfer were more than twice as likely to develop childhood

cancer, particularly leukemia and neuroblastoma, according to the report in *JAMA*… (*Reuters*)

Congo Authorities Say Ebola Survivor Falls Ill a Second Time

An Ebola survivor has fallen ill with the disease for a second time in eastern Congo, the Congolese health authorities said, it was not yet clear if it was a case of relapse or reinfection. Experts say there has been a working assumption that Ebola survivors generally have immunity from the disease. There have been no documented cases of reinfection but some researchers consider it to be at least a theoretical possibility, while the recurrence of a previous infection is considered extremely rare. In a daily report on the epidemic, the Congolese health authorities reported that a survivor in Mabalako, North Kivu province, had fallen ill with the virus again. Representatives of the World Health Organization and Congo's National Institute of Biomedical Research (INRB) said tests were being carried out to determine what had happened… (*Medscape*)

Risk Factors for Sudden Infant Death: It's All in the Timing

Sudden unexpected early neonatal deaths within the first week of life are associated with distinct features that diverge from sudden unexpected infant deaths that take place in the remainder of the first year of life, according to a retrospective analysis of the Centers for Disease Control and Prevention (CDC) data. Across all sudden unexpected infant death (SUID) and accidental suffocation cases recorded by the CDC from 2003 to 2013, lower live birth order, low birth weight, and married parents were risk factors for sudden unexpected early neonatal death occurring within the first week of life. By contrast, risk factors for deaths that occurred in the post-perinatal period (7-364 days) included higher live birth order, single mothers, younger mothers, or smoking in pregnancy, according to the study published online in *Pediatrics*.

Malnutrition Sweeping Asia-Pacific Region

Four UN agencies said that 3 million undernourished people a month across the Asia-Pacific region, must be lifted out of hunger, until the end of 2030, if the SDGs are to be reached. The Food and Agriculture Organization (FAO), UN Children's Fund (UNICEF), World Food Programme (WFP) and WHO are calling for urgent action to put nutrition at the heart of social protection programs throughout the region. A new joint report highlighted that an estimated 77 million children under-five were stunted last year, and 32.5 million suffered from wasting… (*UN*)

WHO Congratulates Sri Lanka for Eliminating Mother-to-child Transmission of HIV, Syphilis

SEAR/PR/1713: The WHO has congratulated Sri Lanka for achieving elimination of mother-to-child transmission of HIV and congenital syphilis.

"Sri Lanka's achievement once again demonstrates the country's commitment to public health and builds on the strong foundation of primary health care services that it laid several decades ago," said Dr Poonam Khetrapal Singh, Regional Director, WHO South-East Asia. The country has not reported any case of mother-to-child transmission of HIV since 2017 and its congenital syphilis cases have consistently been two per 1,00,000 live births, much less than 50 per 1,00,000 live births needed for elimination certification, as per the findings of the Global Validation Advisory Committee… (*WHO*)

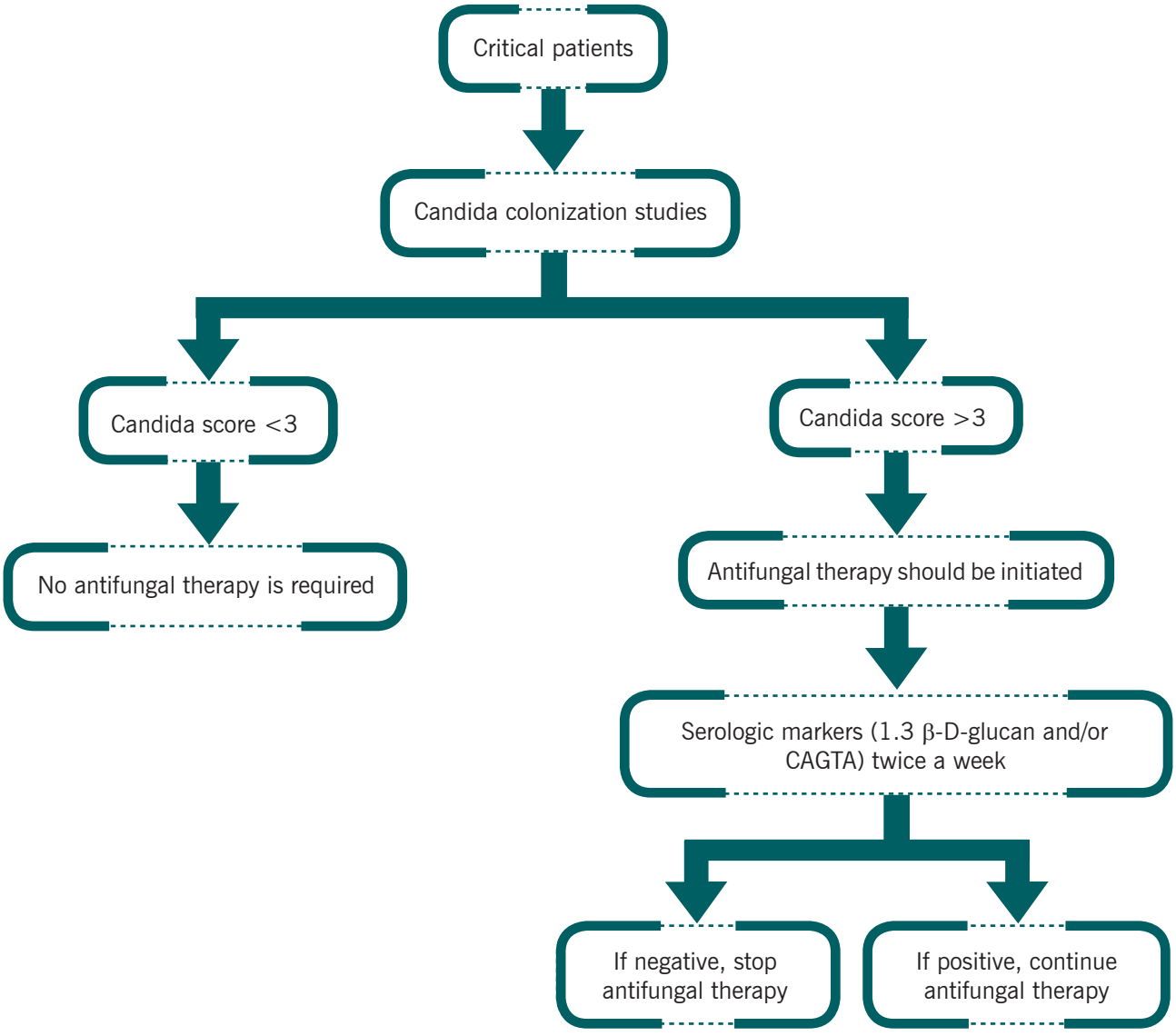
Exercise Advice on Food Labels could Help Reduce Obesity, Researchers Say

Food labels detailing how much exercise is needed to burn off a product's calorie content could help to combat obesity, according to UK researchers.

Physical activity calorie equivalent (PACE) labels could improve on labels that identify only calories and nutrient content, according to a new scientific review. Under the proposed system, a small bar of chocolate would carry a label informing consumers that it would take 23 minutes of running or 46 minutes of walking to burn off the 230 calories it contains. The large-scale application of PACE labels could, on average, cut calorie consumption by up to 200 calories per person per day, according to researchers, whose work is published in the *Journal of Epidemiology and Community Health*… (*CNN*)

■■■■

Invasive Candidiasis



CAGTA: *Candida albicans* germ tube antibody.

Adapted from Candel FJ, Pazos Pacheco C, Ruiz-Camps I, et al. Update on management of invasive candidiasis. Rev Esp Quimioter. 2017;30(6):397-406.

Indian Journal of Clinical Practice, Vol. 30, No. 8, January 2020

Why Do We Offer Food to God in Every Pooja?

KK AGGARWAL

We follow a ritual of offering 'bhog' to the deity we worship. The ritual also involves sprinkling water all around the place where we sit down to eat food. Many people have advocated that the sprinkling of water is related to preventing ants and insects from approaching the food. But in spiritual language there is a deeper meaning to these rituals.

Bhagwad Gita and Yoga Shastras categorize food into three types corresponding to their properties termed as gunas. Depending upon satoguna, rajoguna and tamoguna, the food items are categorized as satwik, rajsik or tamsik. Satwik foods provide calmness, purity and promote longevity, intelligence, strength, health, happiness and delight. Fruits, vegetables, leaves, grains, cereals, milk, honey, etc., are examples of satwik food. These items can be consumed as they are. One can also live on satwik food for life. Rajsik food items possess attributes of negativity, passion and restlessness. Hot, spicy and salty food items with pungent, sour and salty taste promote rajas qualities. Tamsik foods have attributes of inducing sleep, ignorance, dullness and inertia. The examples of tamsik food are meat, onions, garlic, left-over food, etc.

Only satwik food is offered to God. Rajsik and tamsik food is never offered as bhog. The only persons who were offered tamsik and rajsik food in Ramayana were Ahi Ravana and Kumbhkaran. Both of them were of an evil nature. Kumbhkaran signified tamas and Ahi Ravana, rajas or aggression. Tamsik and rajsik food can be converted into satwik by slow heating, sprouting or keeping them in water overnight. The examples are sprouted wheat, chana (chickpeas), etc.

A mixture of honey, milk, ghee, curd and sugar is called panchamrut and is a routine offering to the God. All the five components have satwik properties and their consumption promotes health. In Ayurveda, there is a saying that any food item, which grows under the ground, is tamsik in nature and one, which comes from the top of the tree or plant like leaves, flower and fruits are satwik in nature. Satwik food is usually fresh, seasonal and locally grown.

Human beings are made up of body, mind and soul and soul is equated to consciousness or God. Whatever offered to external God, if, is offered to the internal God or consciousness, leads to inner happiness. The ritual, therefore, of offering food to God before eating forces us to either eat only satwik food or to include a substantial portion of satwik food in our meals. It helps a person convert his meal into a pure satwik one or at least adding satwik items.

Sprinkling water around the plate is considered an act of purification.

Many people confuse bhog with chadhava or offerings to the deity. While bhog is shared with God, chadhava is the offering of your illness or negative thoughts to the God and you go back with prasada of inner happiness. Many people counter the above argument by saying that alcohol is offered to Bhairon, viewed as a demon God, which means alcohol, is good for health. I personally feel that alcohol is offered to Bhairon not as a bhog but as an offering which means that people who are addicted to alcohol go to Bhairon and give their share of alcohol to him, so they can de-addict themselves.

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Group Editor-in-Chief, IJCP Group

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Addiction to Worry

Carole started counseling with me because she was depressed. She had been ill with chronic fatigue syndrome for a long time and believed her depression was due to this. In the course of our work together, she became aware that her depression was actually coming from her negative thinking – Carole was a constant worrier. Many words out of her mouth centered on her concerns that something bad might happen. "What if I never get well?" "What if my husband gets sick?" "What if I run out of money?" (Carole and her husband ran a very successful business and there was no indication that it would not go on being successful). "What if my son gets into drugs?" "What if my kids don't get into good colleges?" "What if someone breaks into the house?"

Her worry was not only causing her depression, but was also contributing to her illness, if not actually causing it. Her worry caused so much stress in her body that her immune system could not do its job of keeping her well. Yet even the awareness that her worry was causing her depression and possibly even her illness did not stop Carole from worrying. She was addicted to it. She was unconsciously addicted to the sense of control that worry gave her.

I understood this well because I come from a long line of worriers. My grandmother's whole life was about worrying. She lived with us as I was growing up and I don't remember ever seeing her without a look of worry on her face. Same is with my mother – constant worry. Of course, I picked up on it and also became a worrier. However, unlike my mother and grandmother, who worried daily until the day they died, I decided I didn't want to live that way. The turning point came for me the day my husband and I were going to the beach and I started to worry that the house would burn down and my children would die. I became so upset from the worry that we had to turn around and come home. I knew then that I had to do something about it.

As I started to examine the cause of worry, I realized that worriers believe that worry will stop bad things from happening. My mother worried her whole life and none of the bad things she worried about ever happened. She concluded that nothing bad happened because she worried! She really believed that she could control things with her worry. My father, however, never worried about anything, and nothing bad ever happened to him either. My mother believed that nothing bad happened to my father because of her worry! She really believed until the day she died (from heart problems that may have been due to her constant worry) that if she stopped worrying, everything would fall apart. My father is still alive at 92, even without her worrying about him!

It is not easy to stop worrying when you have been practicing worrying for most of your life. In order for me to stop worrying, I needed to recognize that the belief that worry has control over outcomes is a complete illusion. I needed to see that not only is worry a waste of time, but that it can have grave negative consequences on health and well-being. Once I understood this, I was able to notice the stomach clenching that occurred whenever I worried and stop the thought that was causing the stress.

Carole is in the process of learning this. She sees that her worry makes her feel very anxious and depressed. She sees that when she doesn't worry, she is not nearly as fatigued as when she allows her addiction to worry to take over. She sees that when she stays in the moment rather than projecting into the future, she feels much better. The key for Carole to stop worrying is in accepting that worry does not give her control.

Giving up the illusion of control that worry gives us is not easy for anyone who worries. Yet there is an interesting paradox regarding worry. I have found that when I am in the present moment, I have a much better chance of making choices that support my highest good than when I'm stuck thinking about the future. Rather than giving us control, worry prevents us from being present enough to make loving choices for ourselves and others. Worrying actually ends up giving us less control rather than more!

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Lighter Side of Medicine

HUMOR

HOTEL SECURITY

A friend and I stayed at a Chicago hotel while attending a convention. Since we weren't used to the big city, we were overly concerned about security.

The first night we placed a chair against the door and stacked our luggage on it. To complete the barricade, we put the trash can on top. If an intruder tried to break in, we'd be sure to hear him.

Around 1 am there was a knock on the door. "Who is it?" my friend asked nervously.

"Honey," a woman on the other side yelled, "you left your key in the door."

ACTIVATE YOUR PHONE LINES

A young businessman had just started his own firm. He had just rented a beautiful office and had it furnished with antiques. He saw a man come into the outer office. Wishing to appear the hot shot, the businessman picked up the phone and started to pretend he had a big deal working.

He threw huge figures around and made giant commitments. Finally, he hung up and asked the visitor, "Can I help you?"

"Yeah, I've come to activate your phone lines."

OUTSTANDING

A man is driving down a country road, when he spots Santu standing in the middle of a huge field of grass. He pulls the car over to the side of the road and notices that Santu is just standing there, doing nothing, looking at nothing.

The man gets out of the car, walks all the way out to our Santu and asks him, "Ah excuse me Sir, but what are you doing?"

Santu replies, "I'm trying to win a Nobel Prize." "How?" asks the man, puzzled.

"Well I heard they give the Nobel Prize to people who are outstanding in their field."

GET ME A BATTLESHIP

After lunching at the Algonquin Hotel, Robert walked through the lobby, out the front door, and said to the uniformed man on the sidewalk, "My good man, would you please get me a taxi?"

The man immediately took offense and replied indignantly, "I'm not a doorman! I happen to be a rear admiral in the United States Navy."

Robert instantly quipped: "All right then, get me a battleship."

HOW WOULD WE KNOW?

A man was complaining to a railroad engineer. What's the use of having a train schedule if the trains are always late?

The railroad engineer replied, "How would we know they were late, if we didn't have a schedule?"

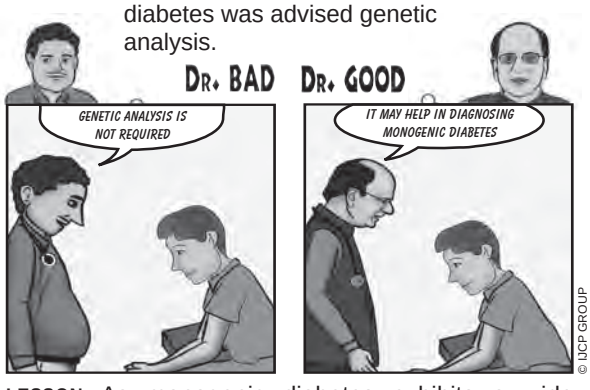
SPOON OUT FIRST?

Doctor, Doctor! I keep getting pain in the eye when I drink coffee!

Doc: Have you ever tried taking the spoon out FIRST?

Dr. Good and Dr. Bad

SITUATION: An individual initially diagnosed with type 1 diabetes was advised genetic analysis.



LESSON: As monogenic diabetes exhibits a wide phenotypic spectrum, it is usually misdiagnosed as type 1 or type 2 diabetes. Although clinical and biochemical parameters can indicate monogenic diabetes, genetic analysis is required for establishing a definitive diagnosis.

Swiss Med Wkly. 2017;147:w14535.

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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.

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