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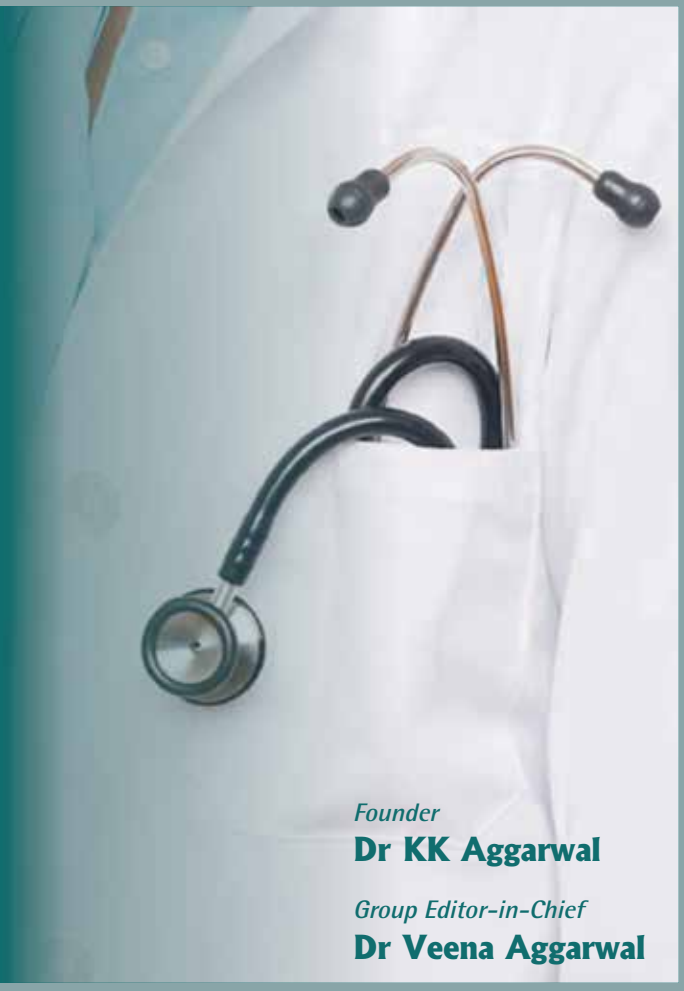

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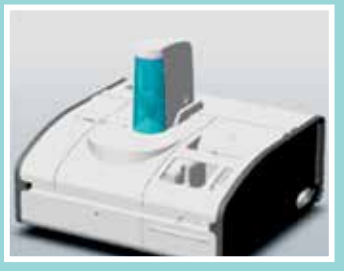

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HCFI DR KK AGGARWAL RESEARCH FUND

HCFI Round Table Environment Expert Zoom Meeting on "The Lancet Planetary Health Report 2022 on Pollution & Health"

May 29, 2022 (Sunday, 12 noon – 1 pm)

- The Lancet Planetary Report on Pollution & Health was released on 17th of May 2022. According to this report pollution remains responsible for ~9 million deaths per year corresponding to 1 in 6 deaths worldwide. These data have been collected from Global Burden of Diseases, Injuries and Risk Factors Study, etc. These deaths are attributed to ambient air pollution and toxic chemical pollution. Deaths from these pollution risk factors are unintended consequences of industrialization and urbanization.
- In many developing countries and low- and middle-income countries, the emissions and effluent discharges do not meet the standards. They are untreated or partially treated.
- Despite ongoing efforts by various state governments, UN agencies, NGOs, committed individuals and groups, there is little real progress against pollution. Pollution is more severe in the low- and middle-income group countries, especially in Southeast Asia.
- This report says that urgent attention is needed to control pollution and prevent pollution-related diseases with emphasis on air pollution and lead poisoning because pollution, climate change and biodiversity losses are very closely linked with each other.
- The Report says that pollution has typically been viewed as local issue to be addressed through some national regulations or sometimes, using regional policy in higher-income countries.
- But pollution is a planetary problem; for instance, dust from other countries is also a source of air pollution in Delhi-NCR. Hence, it requires a global response similar to the global fight against the pandemic.
- Global efforts can synergize with other global environmental policy programs and large-scale, rapid transition away from all fossil fuels to clean, renewable energy is an effective strategy. India is doing a lot on renewable energy.
- Massive tree plantation program is also required.
- International organizations and national governments need to continue expanding the focus on pollution as one of the most important global environmental issue along with climate change and biodiversity.
- Environmental management is generally taken as pollution control, but this is not true. This is a reform, i.e., to consider that environmental management is more important than pollution control, is overdue. Because pollution control does not take care of

prevention and abatement. Pollution control is inefficient because of poor monitoring. The focus is on control rather than prevention and abatement.

- Allocation of responsibility in an ambient sample is extremely difficult. Quite often there are variants in reports, which make it difficult to decide on the result that should be adopted.
- There are several institutions in business managements but there are hardly any comparable institutions for environmental benefits. We have to focus on institutional aspects and aspects other than control such as the legal aspect of management of environment.
- It is a very complicated study and report and needs very in-depth analysis. But certain clear facts emerge that pollution, especially air pollution and water pollution, is directly related to health particularly for the lowest economic strata or working class population.
- It is a very worrisome situation and needs a lot of attention. The debate should not be on lines of whether we are going to increase the temperature 1.5 degree by 2030 or by 2 degrees by 2050. The issue is that there is a problem and it needs to be addressed. Burden of adaptation and cost of mitigation should not be on the developing world.
- India has pioneered the international solar alliance with more than 143 countries as partners. India has also championed the production, subsidizing the rate as well as cost of production of solar energy without any international funding.
- All identified actions, whichever possible, need to be prioritized and have to be spearheaded without any delay.
- Why is pollution created? The answer to this question is most important as knowledge about this is still inadequate.
- Everybody knows about the pollution measures but they are not being followed or adhered to. People do not comprehend the depth and severity of the problem.
- Global warming and pollution resulting in health issues is a serious issue and is affecting all of us. We are more disease-prone today than we were in the past. Life expectancy has increased but people are suffering and people are living more with disease than they did in the past. We have to respect nature and learn to live with nature.
- Industries, businesses and consumers, all have a vital role to play if we have to control pollution.
- Lifestyle and health are directly linked and may affect other parts of the world too. In 2019, there were a cluster of pneumonia cases in Wuhan, from where COVID-19 spread to almost every country in the world. These cases were directly related to lifestyle and were traced to Huanan sea food market. Although not proven to be the origin of COVID-19, the pandemic prompted demands for immediate and comprehensive restrictions on consumption of wild animals.
- A large proportion of emerging infectious diseases are zoonotic in origin and spread to humans during zoonotic spillover.
- Wildfires emit many carcinogenic pollutants that contaminate air, water, terrestrial and indoor environments. Long-term exposure to wildfires has been associated with the risk of lung cancer and brain tumors.
- Pollution control measures are generally regarded as burden by many industries. They need to be motivated.
- A three pronged strategy is required; first is transition from fossil fuel to renewable energy, second is proper waste management or zero waste and the third is massive tree plantation.
- There is need for a lifecycle approach in industries to find out the step at which maximum pollution occur, which can be specifically targeted and that sector can be focused on.
- Enforcement of rules and regulations is poor. Lack of awareness among authorities is a major issue. If the authorities are not aware then public will not be able to understand the difference.
- Some subsidy or tax rebate can be given as incentive or penalties can be made more stringent. This may facilitate implementation.

Participants: Dr Anil Kumar, Mr Vivek Kumar, Mr Paritosh Tyagi, Dr M Dwarakanath, Mr Neeraj Tyagi, Mr Pradeep Khandelwal, Mr Ankit Sethi, Mr Varun Singh, Mr Vikas Singhal, Ms Ira Gupta, Dr S Sharma

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Bempedoic Acid: The Latest in Lipid-lowering

ABSTRACT

Bempedoic acid is a novel nonstatin drug that has recently been approved for the management of hypercholesterolemia, in patients with established atherosclerotic cardiovascular disease (ASCVD) or with heterozygous familial hypercholesterolemia (HeFH). This editorial describes the basic and clinical pharmacology of bempedoic acid, and suggests a pragmatic approach to its use in clinical practice.

Keywords: Bempedoic acid, cholesterol, dyslipidemia, familial hypercholesterolemia, CV risk reduction, residual risk, statin, statin intolerance

Dyslipidemia is an important contributor to the burden of atherosclerotic cardiovascular disease (ASCVD). Ensuring optimal lipid levels is an effective way of reducing ASCVD. Conventionally, statins have been used to manage dyslipidemia.[1] However, there still remains a residual risk of cardiovascular disease (CVD) which cannot be mitigated by statins. Some individuals are not able to tolerate the drug, while others do not respond even to maximal doses. Alternatives to statins, such as fibrates, ezetimibe and PCSK9i (proprotein convertase subtilisin/kexin type 9 serine protease inhibitors) are limited by lack of tolerability, efficacy and affordability, respectively.[2] This is unfortunate, because lipid-lowering is considered low-hanging fruit, for CVD risk reduction, as compared to glucose and weight management. There is a lack of suitable therapies that can serve as complements or alternatives to statins. Keeping this in context, the approval and availability of bempedoic acid in India is a welcome development.

BASIC PHARMACOLOGY

Bempedoic acid is an orally administered pro-drug with the IUPAC name 8-hydroxy-2,2,14,14-tetramethyl-pentadecanedioic acid. It inhibits the hepatic enzyme adenosine triphosphate-citrate lyase (ATP-citrate lyase), after being activated to its thioester with coenzyme A, by the enzyme SLC27A2. ATP-citrate lyase acts on hepatic biosynthesis of cholesterol, upstream of the enzyme 3-hydroxy-3-methylglutaryl coenzyme A (HMG-CoA) reductase.[3] Thus, its mechanism of action is distinct from, and complementary to, that of statins.

The absorption of bempedoic acid is not affected by food or timing of administration. It reaches peak concentration in 3.5 hours, and has a half-life of 21 ± 11 hours. Excretion is through the renal (70%) and fecal (30%) route.

CLINICAL PHARMACOLOGY

Bempedoic acid has been approved by the United States Food and Drug Administration (USFDA) and the European Medicine Association (EMA). Bempedoic acid has been shown to reduce LDL-C (low-density lipoprotein cholesterol), total cholesterol, non-HDL-C (non-high-density lipoprotein cholesterol) and apolipoprotein B (apo B) levels significantly. In a trial of 2,230 patients with a mean baseline LDL-C of 103.2 ± 29.4 mg/dL, bempedoic acid reduced the mean LDL-C level by 19.2 mg/dL at 12 weeks (−16.5% from

baseline).[4] In the CLEAR (Cholesterol-Lowering via Bempedoic Acid, an ACL-Inhibiting Regimen) Serenity study, statin intolerant patients, with a mean baseline LDL-C of 157.6 mg/dL, bempedoic acid significantly reduced LDL-C (placebo-corrected difference, −21.4%), non-HDL-C (−17.9%), total cholesterol (−14.8%), apo B (−15.0%) and high-sensitivity C-reactive protein (CRP, −24.3%; $p < 0.001$ for all comparisons).[5]

It can be used as a standalone drug and as part of fixed-dose combination with ezetimibe. It can also be used with statins. It must be noted that concomitant use with bempedoic acid increases blood levels of statins, especially simvastatin and pravastatin. The reason is not known, as bempedoic acid does not interact with the cytochrome P450 enzyme.

Studies are ongoing to determine the effect of bempedoic acid on cardiovascular morbidity and mortality. A systematic review and meta-analysis of 11 trials has shown bempedoic acid to be associated with a reduction in composite cardiovascular outcomes (relative risk [RR] 0.75), along with reduction in LDL-C (21.4%) and CRP (24.3%) levels. In contrast to statins, it is also associated with a reduction in rates of new-onset or worsening of diabetes (RR 0.65).[6] It is apt to point that bempedoic acid is an AMPK (adenosine monophosphate kinase) activator. Though its clinical significance in the context of lipid-lowering is unknown, AMPK activation is a feature of modern glucose-lowering drugs.

Bempedoic acid inhibits the transporter proteins SLCO1B1, SLCO1B3 and SLC22A7. Inhibition of SLC22A7, and inhibition of renal tubular OAT2, may lead to a rise in uric acid and precipitate gout. Increase in uric acid usually occurs within the first month of treatment, and persists. The average increase in uric acid at 12 weeks of therapy is 0.8 mg%. The placebo-subtracted risk of gout is 1.1%, and is higher in persons with previous history of gout.[7] Tendon rupture has been seen in 0.5% patients, and is more common in persons aged >60, those on corticosteroids or fluroquinolones, those with renal failure or previous history of tendon disorders.

Apart from gout, adverse events include muscle spasms, back or limb pain, gout and tendon rupture of the rotator cuff of the shoulder, biceps tendon or Achilles tendon. These adverse effects are rare, however.

PRAGMATIC USAGE

Bempedoic acid can be used in all patients with dyslipidemia, as an adjunct to diet and statins/other lipid-lowering therapy, if existing therapy is unable to achieve the goal. It is also indicated in persons with statin intolerance.[3] Bempedoic acid may also be used in heterozygous familial hypercholesterolemia (HeHF), and in persons with ASCVD to lower LDL-C, if it is felt that statin monotherapy will not be able to achieve target LDL-C goal alone.

Table 1 is a list of the clinical indications, concerns, caveats, checkpoints and contraindications associated with bempedoic acid use. The dose is 180 mg orally, once a day, with or without food.

It can be used safely in elderly persons; in those with diabetes irrespective of their glucose-lowering therapy; and with mild-moderate renal or hepatic impairment. It does not have any effect on the QT interval. It can be prescribed with all doses of atorvastatin, rosuvastatin and ezetimibe.

Table 1. Bempedoic Acid: Pragmatic Prescription

Clinical indication: dyslipidemia

Initiation of therapy

- Heterozygous familial hypercholesterolemia
- Established ASCVD
- Multiple risk factors for ASCVD

  Where it is unlikely that maximal statin therapy will able to achieve target LDL-C

Intensification of therapy

- When maximally tolerated statin dose is unable to achieve target LDL-C

Interchange of therapy

- When statin therapy is contraindicated or not tolerated

Contraindications

- Avoid concomitant use with simvastatin >20 mg, pravastatin >40 mg
- Pregnancy/lactation
- Severe renal impairment (eGFR <30)
- Severe hepatic impairment (Child-Pugh C)

Concerns

- Risk of gout (OR 3.29)
- Risk of muscular disorders (OR 2.60)
- Worsening of renal function (OR 4.24)

Check points

- Monitor serum uric acid periodically; treat as appropriate

Caveats

- Be careful in persons with previous history of gout, renal failure, concomitant corticosteroid use, fluoroquinolone use

ASCVD = Atherosclerotic cardiovascular disease; LDL-C = Low-density lipoprotein cholesterol; eGFR = Estimated glomerular filtration rate; OR = Odds ratio.

SUMMARY

Bempedoic acid represent a significant breakthrough in lipid management. Current prescribing information and data support its use for dyslipidemia management, in the settings of primary, secondary and tertiary intervention. While initial data is promising, we look forward to real-world evidence in Asian populations, as well as the result of the long-term cardiovascular outcome trial. The availability of bempedoic acid should encourage a change in modern statin-centric lipid management guidelines, and help them evolve into a more person-centered, rather than drug-centered, guidance.

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Dr Ashok Agarwal, NLR India Foundation Emphasizes India's Role in Leprosy Prevention

According to Dr Ashok Agarwal, Managing Trustee of the NLR India Foundation (until No Leprosy Remains), leprosy is one of the most overlooked tropical diseases (NTDs). It is among the twenty most communicable, chronic, debilitating and disfiguring disorders, with over 60% occurring in India. As a result, India bears an enormous burden tocombat leprosy.

He further said that in 2016, NLR attempted a single dosage of rifampicin as a preventive remedy for the first time in India, and the results were so encouraging that the government adopted it as a nationwide program, which has helped to minimize the incidence of new infections.

COVID-19 pandemic has adversely affected the detection of new cases by decreasing to about 40% in the preceding 2 years inflicting delays in detection, remedy and prevention, in addition to the accelerated danger of lifelong disability. Even though multidrug therapy (MDT) is freely available in the country, the current challenges in treating leprosy include resentment of patients to seek medical help and treatment due to stigma and discrimination and the problem of acquiring single-dose rifampicin preventive therapy.

On the 23rd Foundation Day, the NLR acknowledged its contribution in not only reducing leprosy cases, but also developing four different self-care models that work in the community, at the PSE level, the third model combines leprosy care with lymphatic filariasis, and the fourth model, developed in West Bengal, is reaching out to thousands of people affected in their homes through ASHA. NLR is striving toward a vision of zero leprosy cases, and we are guided by three worldwide strategy pillars: zero transmission, zero impairment and zero exclusion. (*Source: ETHealthworld, 27, 2022*)

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REVIEW ARTICLE

Common Coronary Anomalies on MDCT

RAMA MURTHY SK*, MAHESH C*, AMARESH RAO M†, SUJATA PATNAIK*

ABSTRACT

Coronary artery anomalies are rare, and the incidence is around 1 to 2% in the general population. Majority of the patients are asymptomatic and detected while investigating another clinical issue. A few anomalies may be life-threatening due to the malignant course with potential for ischemia and even sudden death. Multidetector computed tomography (MDCT) has high accuracy in detecting these anomalies because of volume rendering (VR) and multiplanar reconstruction (MPR). 'High take-off', origin of the coronary artery from the opposite or noncoronary cusp with anomalous course and coronary artery fistula are three most frequent anomalies. MDCT can be a useful screening tool in the study of coronary anomalies.

Keywords: Coronary artery anomalies, MDCT, high take-off

Coronary artery anomalies are rare, and the incidence is around 1% to 2% in the general population. Multidetector computed tomography (MDCT) has high accuracy in detecting these anomalies because of volume rendering (VR) and multiplanar reconstructions (MPRs). Majority of the patients are asymptomatic and detected while investigating another clinical issue. A few anomalies may be life-threatening due to the malignant course with potential for ischemia and even sudden death. Moreover, failure to cannulate these vessels during conventional angiography can be minimized if the existence of these anomalies is known to the operator. This article presents an unpublished retrospective case series and review of literature of common coronary anomalies detected on MDCT.

At Nizam's Institute of Medical Sciences (NIMS), Hyderabad, 770 patients underwent CT-conventional coronary angiography (CAG), on 128-slice single source MDCT (SOMATOM Definition AS ± SEIMENS) during the last 3 years (unpublished data). On analysis, coronary artery anomalies were found in 23 patients (3%). Their ages ranged from 25 to 82 years. Majority of the cases were in 51 to 60 years age group. Among them, 17 were males. The most common anomaly seen was high take-off of coronary arteries, seen in 10 cases. Of them, 2 were having high origin of right coronary artery (RCA) (Fig. 1), 7 were having high origin of left main coronary artery (LMCA) and one was having high origin of both coronary arteries with acute kink at the origin of RCA. Anomalous origin of coronary artery from opposite sinus was seen in 8 cases (Figs. 2-5). RCA from left coronary sinus with interarterial course between aorta and right ventricular outflow tract was seen in 5 cases. Anomalous origin of left coronary artery (LCA) from right coronary sinus with interarterial course between aorta and right ventricular outflow tract was seen in 2 cases. Anomalous origin of left circumflex artery (LCx) from right coronary sinus with retroaortic course was seen in 1 case (Fig. 6). Separate ostia for left anterior descending artery (LAD) and LCx was noted in 3 patients (Figs. 7 and 8). Shepherd crook deformity of proximal segment of RCA was seen in 1 patient. Super-dominant RCA with absent LCx was seen in 1 patient (Fig. 9).

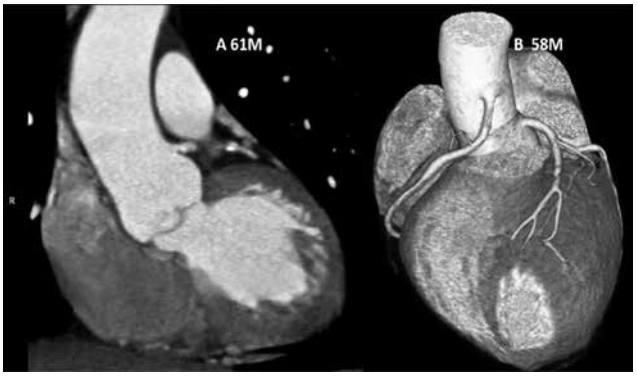

Figure 1. Two different patients of 'high take-off' of LCA in patient aged 61/M and RCA in patient aged 58/M.

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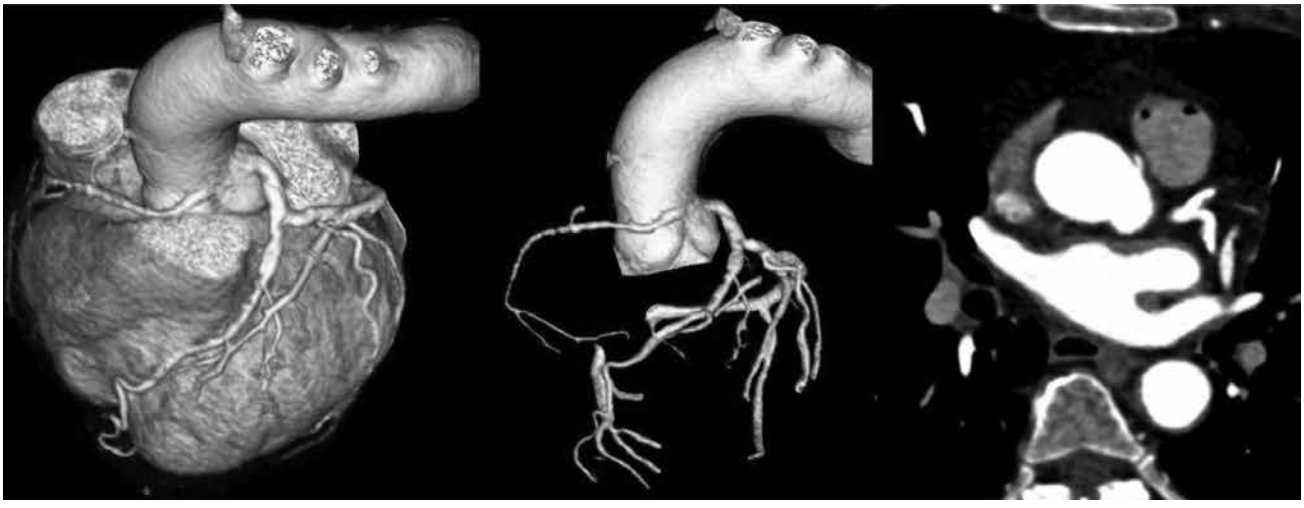

Figure 2. VRT and axial images of a patient (55/F) showing RCA originating from left coronary sinus of Valsalva. Course of RCA is interarterial.

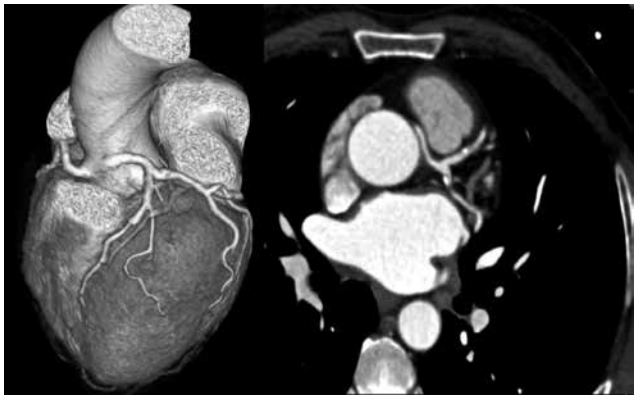

Figure 3. VRT and axial images of a patient aged 59/M depicting the origin of LCA from RCA having interarterial course.

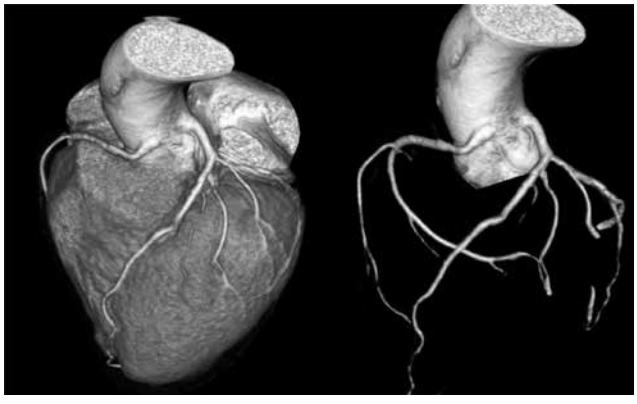

Figure 4. Origin of RCA and LCA from left coronary sinus in a patient aged 35/M.

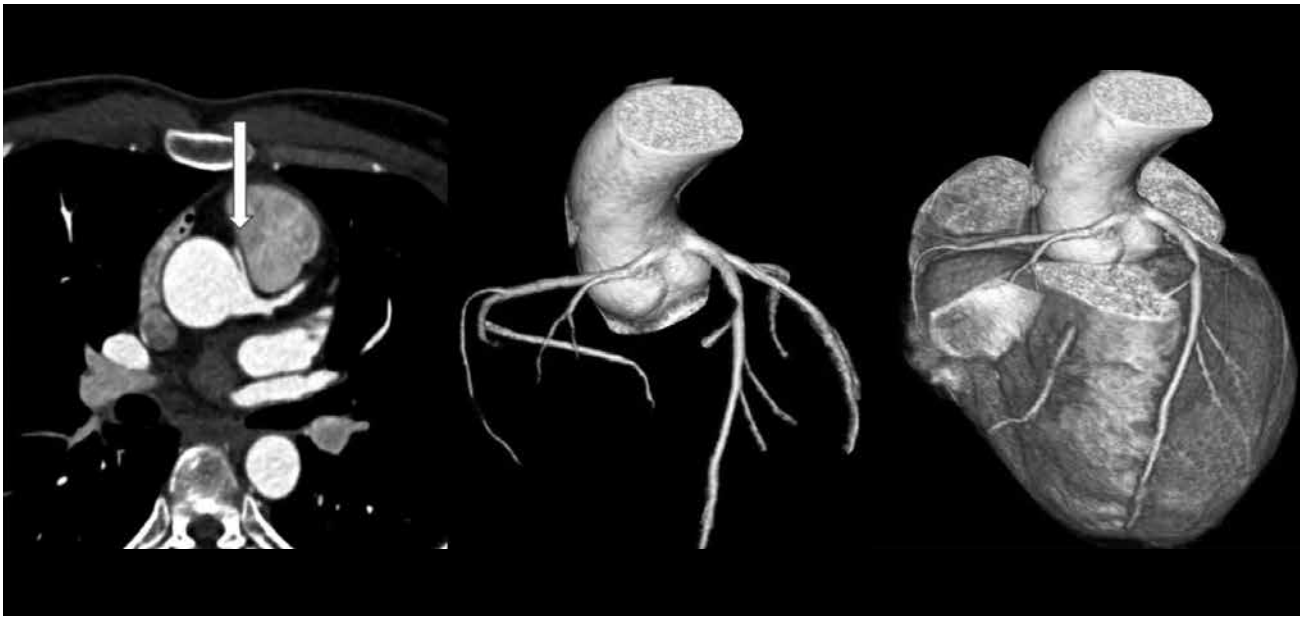

Figure 5. Origin of RCA and LCA from left sinus of Valsalva with interarterial course of RCA in a patient aged 25/M.

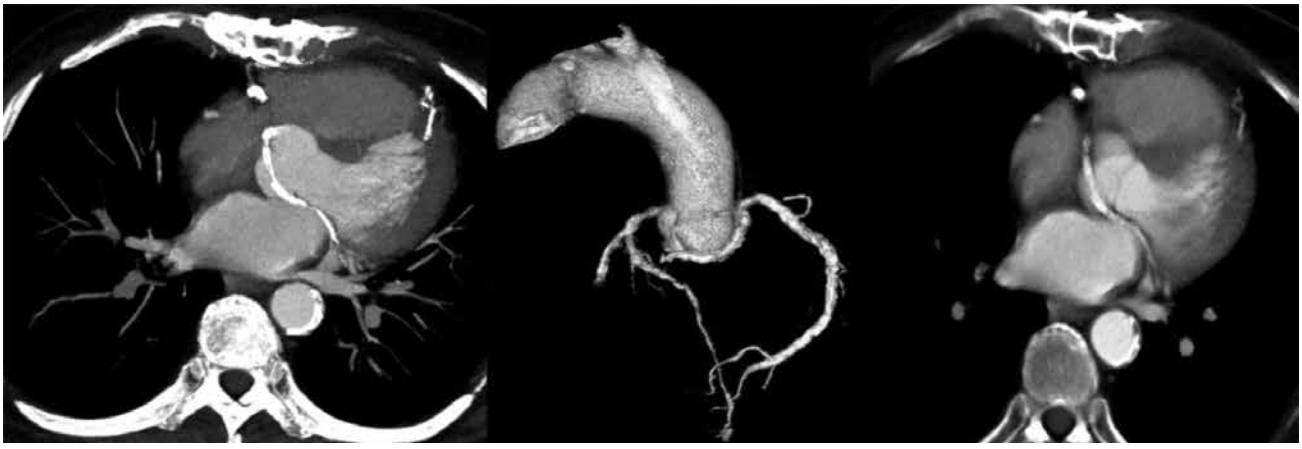

Figure 6. LCx is originating from right coronary sinus with retroaortic course in axial and VRT images of patient aged 82/M.

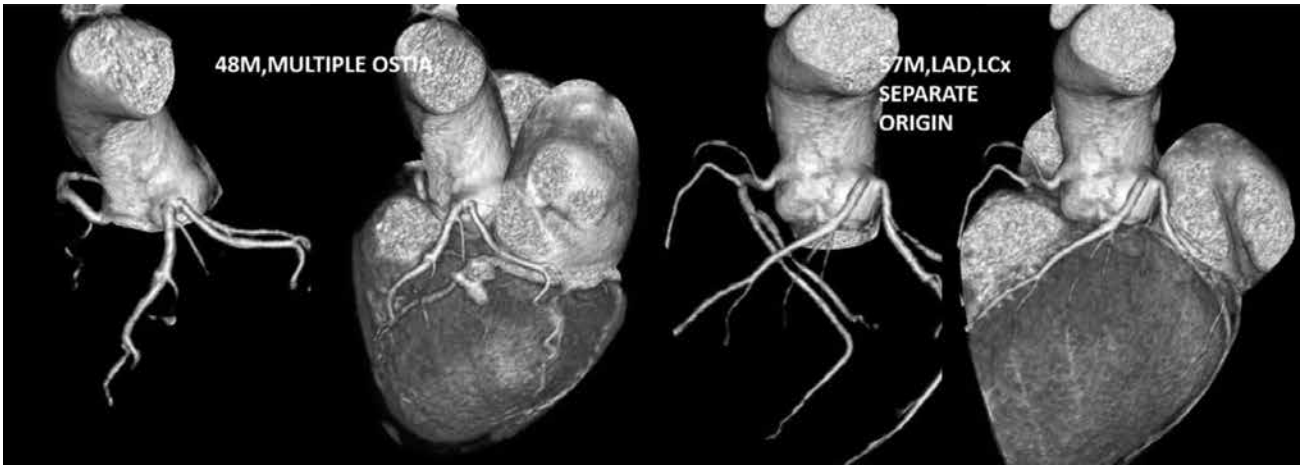

Figure 7. Two patients aged 48/M and 57/M, CT-CAG VRT images showing separate origin of LAD, LCx and there is no LMCA.

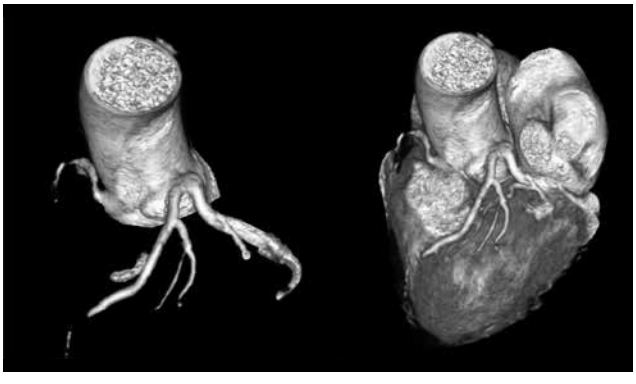

Figure 8. Separate origin of LAD and LCx in a patient aged 71/M.

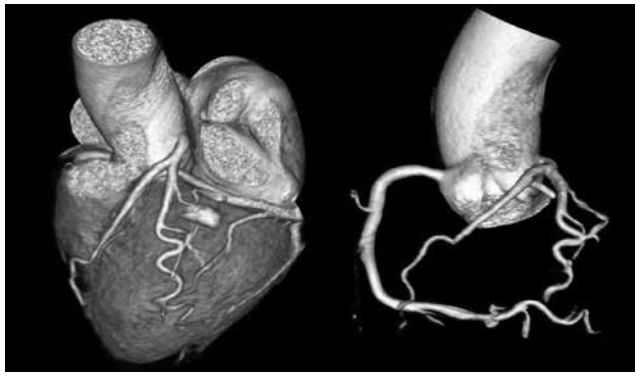

Figure 9. A patient aged 52/F having super-dominant RCA. LCx is absent.

The prevalence of coronary anomalies is reported to be approximately 0.3 to 1% in various studies.[1] Due to lack of uniformity of diagnostic criteria, the true incidence is not known. Any coronary pattern with deviation in the number of ostia, variation in the sinus of origin, the course that is not common in the general population, can be counted as an anomaly. It is important to categorize them as major or minor depending on their potential for clinical consequence. With advances in noninvasive imaging, more anomalies are getting diagnosed compared to autopsies or invasive cine-angiograms. Recent advances in MDCT

technology with 100% sensitivity in detecting these anomalies, have made it a more acceptable diagnostic tool. Although majority of the anomalies are benign with conceptual and educational interest, a few have potential for ischemic symptoms, and even sudden cardiac death especially during exercise or during competitive sports. The anomalies associated with structurally abnormal hearts have to be a special group due to their importance during the surgical correction. It is most convenient to consider the isolated coronary anomalies as − 1) Anomalies of the origin and course (High origin, ostia in unexpected sinus, single coronary artery, separate LAD and LCx, etc.); 2) Anomalies of the intrinsic anatomy (Coronary ectasia, hypoplasia, total absence, etc.); and 3) Anomalies of termination (Coronary-cameral fistulae, etc.).

The authors observed coronary anomalies in 3% that is 23 out of 770 cases using 124 slice MDCT. In a study, 6,014 consecutive patients that underwent 64 slice MDCT were analyzed by Yang et al and coronary anomalies were found in 66 (1.09%) patients. All had one or more symptoms like chest pain, dyspnea, palpitations, arrhythmias and myocardial infarction. They found high take-off, origin of the coronary artery from the opposite or noncoronary cusp with anomalous course, and coronary artery fistula as three most frequent anomalies. They opined that due to VR technique in CT angiograms they identified a few lesions, which were not clear in conventional cineangiograms.[2]

Most common anomalies are high origin of coronaries from aorta with a normal course. There are cases when RCA arises few millimeters above sinotubular junction, but distance of 2 cm has also been recorded.[3] In our experience, there were 10 (1.3%) out of 770 cases with high take-offs. High take-off usually has no clinical problems but may cause difficult cannulation. Incidence is 0.60% as per a study by Fujimoto et al in their series of 5,869 cases.[4]

Multiple ostia of right and left coronaries can be considered as important anomalies. RCA and conus branch may arise separately. Similarly, LAD and circumflex arise separately with no LCA, which accounts for small percentage with normal course. Incidence of separate ostia for LAD and LCx from left coronary sinus was 0.26% in a series.[4] In our series, we had 3 cases of separate origin of LAD and LCx accounting for 0.39%.

Origin of coronary artery or branch from the opposite or noncoronary sinus is another anomaly that is commonly observed. These anomalies are classified into 4 types. One is interarterial course between aorta and pulmonary artery. Second one is retroaortic course. Third is prepulmonic and septal or subpulmonic course. The interarterial course is clinically important as it is associated with sudden death.[5] Fujimoto et al, in their series of 5,869 cases, noted that 29 cases had opposite coronary sinus and in 27 of these cases RCA arose from left coronary sinus.[4] All these cases had interarterial course. It is reported that 30% of these have sudden cardiac death. Anomalous origin of coronary artery from opposite sinus was seen in 8 cases accounting for 1.04%. RCA from left sinus were 5 and LCA from right coronary sinus were 2 with interarterial course. In 1 case, LCx was arising from right coronary sinus with retroaortic course.

Finocchiaro et al in their study of 5,100 cases found anomalous coronary arteries in 0.6%. Anomalous left coronary artery (ALCA) arising from right sinus of Valsalva with interarterial course (11) and RCA originating from left sinus of Valsalva (RACA) with interarterial course (11) were most commonly found. ALCA arising from pulmonary artery was present in 7 cases and in 1 case, the LCA arose from noncoronary sinus.[6] In a similar study by Nguyen, the incidence of anomalies was 47 out of 9,572 cases (0.49%). LCx from RCA/right sinus of Valsalva was seen in 31.9%. High take-off of RCA was seen in 23.4%, RCA from left coronary sinus was noted in 17% and LCA from right coronary sinus was seen in 10.6%.[7] Approximately 1.04% of our cases had anomalous origin of coronary artery (5 RCA and 2 LCA, and in 1 LCx was originating from right coronary sinus with retroaortic course).

Super-dominant RCA with absent LCx artery is an exceedingly rare congenital anomaly that can be confused with atherosclerotic total occlusion. There are a few such case reports in the literature.[8] We observed one such case of super-dominant RCA with absent LCx. Single coronary artery is extremely rare with prevalence of 0.09% (5 out of 5,869 cases) in a study by Fujimoto et al.[4] Its clinical implication is complex when the patient develops atherosclerosis in the proximal segment and it can be a challenging situation for either angioplasty or coronary artery bypass grafting (CABG).

CONCLUSION

Due to the noninvasive nature of the modality and the advantage of VR and MPR techniques, MDCT can be a useful and preferred screening tool in the study of coronary anomalies.

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Vitamin D: More Effective among those with Low Insulin Secretion Than Prediabetics

The data published from the prospective Diabetes Prevention with Active Vitamin D (DPVD) trial online in the *British Medical Journal* disclosed that vitamin D supplementation doesn't reduce the risk of developing type 2 diabetes among the prediabetics, but benefits those with low insulin secretion.

The study had a total of 1,256 participants. At baseline, the average blood 25-hydroxyvitamin D concentration was 20.9 ng/mL (52.2 nmol/L); 43.6% of the people had values much <20 ng/mL. Over 3 years, 12.5% of the 630 eldecalcitol patients and 14.2% of the 626 placebo patients developed diabetes (HR 0.87, 95% CI 0.67-1.17; p = 0.39). There was also no difference in normoglycemia regression, which occurred in 23.0% of eldecalcitol patients versus 20.1% of placebo patients by the end of the research (p = 0.21).

After adjusting for predetermined covariates, eldecalcitol was found to be efficacious in avoiding the development of type 2 diabetes (HR, 0.69; p = 0.02). According to findings from the type 2 diabetes study, maximum benefited groups included prediabetics having low vitamin D levels and non-obese benefited the most and those with higher vitamin D blood levels, but that large supplemented dosages may have impaired musculoskeletal effects in the elderly.

Although eldecalcitol medication did not significantly lower the incidence of diabetes in patients with prediabetes, the findings revealed that eldecalcitol could have a favorable effect on people who had insufficient insulin secretion. (*Source: Medscape Medical News, May 26, 2022*)

Highly Polluted Air Increases Stroke Mortality

An observational study published in *Neurology* indicated a greater mortality due to stroke among hospitalized stroke patients living in areas with high air pollution. The size of ambient particulate matter (PM) and the length of exposure influenced the risk level.

It was observed that smaller particles (PM1) and longer-term pollution exposures had the most significant effect sizes. The link was higher in people who had ischemic strokes rather than hemorrhagic strokes.

In-hospital deaths due to stroke accounted for 32,140 deaths out of 3,109,634 stroke hospitalizations (case fatality rate 1.03%). Seventy-one percent cases had been because of ischemic stroke. The most common exposure was to PM10 (38%), followed by PM2.5 (26%) and PM1 (17%). Longer-term exposures were found in 18%, 12% and 8% of cases, respectively, prior to the stroke. The authors of the study cautioned that the connections discovered in the study may differ for patients who are not hospitalized for stroke.

In-hospital stroke-related fatalities are linked to PM pollution. Stroke patients' health outcomes may be improved by strategies aimed at lowering PM pollution. (*Source: MedPage Today May 25, 2022*)

OBSERVATIONAL STUDY

A Prospective Observational Study of Spectrum of Tropical Infections in Pregnancy in a Tertiary Care Hospital in Mumbai, Maharashtra

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ABSTRACT

Background and aims: Pregnancy is associated with several hormonal and mechanical changes in the body. The tropical infections that most commonly affect pregnant females are malaria, dengue, leptospirosis and typhoid. These tropical infections cause many medical complications in pregnancy by causing anemia, thrombocytopenia, bleeding and inflammatory reactions. Therefore, we conducted a study to evaluate the clinical presentation, complications and outcome of tropical infections in pregnancy. **Material and methods:** The present study was conducted at a tertiary care hospital in Mumbai, Maharashtra over a period of 1½ year (January 2018 to June 2019) after getting approval from Institutional Ethics Committee. In this study, 250 pregnant patients admitted in medicine ward, obstetrics and gynecology ward, and ICU with symptoms and signs of tropical infections and age more than 18 years, who gave written informed consent, were included. **Results:** The most common age group amongst the study population was 20 to 24 years (41.6%), followed by 25 to 29 years (40%) and 30 to 35 years (18.4%). Most of the study population had gestational age of 1 to 12 weeks (61.6%), followed by 13 to 28 weeks (31.6%) and more than 28 weeks (6.8%). Most of the study population had parity 2 (46.8%), followed by parity 1 (43.2%), parity 3 (6.8%) and parity 4 (3.2%). The most common clinical features amongst the study population was fever (62%), followed by headache (32.8%), nausea (30.8%), pain in abdomen (26.4%) and petechiae (26%). The most common infections amongst the study population were malaria (11.2%), dengue (8%), leptospirosis (6%) and enteric fever (5.2%). The most common medical complications were bleeding due to thrombocytopenia (TCP) (6.8%), followed by serositis (5.2%), ARDS (4.4%), meningitis (2.8%), subconjunctival hemorrhage (2.8%) and encephalitis (1.4%). Complicated infections were seen in 30% of the study population. **Conclusion:** All pregnant women must be evaluated at primary care centers properly in their antenatal visits for their parity status and any associated risk factors and diseases. By doing this, we can reduce many tropical infections, complications and maternal mortality in early stage of pregnancy.

Keywords: Pregnancy, tropical infections, malaria, dengue, leptospirosis, thrombocytopenia

Pregnancy is associated with several hormonal and mechanical changes in the body.[1,2] The tropical infections that most commonly affect pregnant females are malaria, dengue, leptospirosis and typhoid. These tropical infections cause many medical complications in pregnancy by causing anemia, thrombocytopenia, bleeding and inflammatory reactions. In places where malaria transmission is high, pregnant women may present with only a few symptoms or are asymptomatic during infection, thus making diagnosis a challenge. Primigravida have a high risk of infection and adverse pregnancy outcomes as they do not have immunity to the pregnancy-specific variants of *Plasmodium falciparum* that accumulate in the placental intervillous space, causing placental malaria and occult placental malaria. The parasitized red blood cells infiltrating the placenta have been shown to be functionally and antigenically different from those seen in nonpregnant individuals. Placental parasite isolates express variable surface antigens on the parasitized red blood cell surface, thus conferring a distinctive adhesive phenotype which enables them to sequester in the placenta. Nearly all nonplacental isolates of *P. falciparum* bind to CD36; however, placental isolates bind to glycosaminoglycans such as chondroitin sulfate A expressed on placental syncytiotrophoblast, and do

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not bind to CD36.[3,4] Immunity to placental malaria is acquired during later pregnancies as women develop antibodies to prevent *P. falciparum* sequestration and enhance opsonic clearance of the parasitized cells.[3-5] Immunocompromised women, such as those with human immunodeficiency virus (HIV), do not develop the protective immunity and hence women of all gravidae can develop malaria. *Plasmodium vivax* does not accumulate in the placenta to the same extent as *P. falciparum*. However, studies suggest that it can adhere to placental glycosaminoglycans and does cause maternal anemia and fever, which contribute to both preterm delivery and fetal growth restriction.[6,7]

Pregnant patients of dengue usually have a typical presentation of fever with headache, retro-orbital pain, muscle ache and thrombocytopenia. Case reports have also reported epigastric pain, bleeding and petechiae hemorrhage among pregnant women with dengue fever.[8,9] Leptospirosis in pregnant patients may present with fever, thrombocytopenia, nausea, vomiting and abdominal pain.[10]

MATERIAL AND METHODS

The present study was conducted at a tertiary care hospital in Mumbai, Maharashtra, over a period of 1½ year (January 2018 to June 2019) after getting approval from Institutional Ethics Committee. In this study, 250 pregnant patients admitted in medicine ward, obstetrics and gynecology ward, and ICU, with symptoms and signs of tropical infections and age more than 18 years who gave written informed consent, were included. Those who expired before the presence or absence of infection in them would have been established were excluded.

RESULTS

This prospective observational study was conducted on 250 pregnant women with signs and symptoms of tropical infections.

Table 1 shows that the most common age group amongst the study population was 20 to 24 years (41.6%), followed by 25 to 29 years (40%) and 30 to 35 years (18.4%).

As seen in Table 2, most of the study population had gestational age of 1 to 12 weeks (61.6%), followed by 13 to 28 weeks (31.6%) and more than 28 weeks (6.8%).

Table 3 shows that most of the study population had parity 2 (46.8%), followed by parity 1 (43.2%), parity 3 (6.8%) and parity 4 (3.2%).

Table 1. Age Distribution Amongst Study Population

Age group	Frequency of infection	Percentage (%)
20-24 years	104	41.6
25-29 years	100	40
30-35 years	46	18.4
Total	**250**	**100**

Table 2. Gestational Age Amongst Study Population

Gestational age	Frequency of infection	Percentage (%)
1-12 weeks	154	61.6
13-28 weeks	79	31.6
>28 weeks	17	6.8
Total	**250**	**100**

Table 3. Parity Status Amongst Study Population

Parity	Frequency of infection	Percentage (%)
1	108	43.2
2	117	46.8
3	17	6.8
4	8	3.2
Total	**250**	**100**

As seen in Table 4, the most common clinical feature amongst the study population was fever (62%), followed by headache (32.8%), nausea (30.8%), pain in abdomen (26.4%) and petechiae (26%).

As seen in Table 5, the most common type of infections amongst study population were malaria (11.2%), dengue (8%), leptospirosis (6%) and enteric fever (5.2%).

Table 6 shows that the most common medical complication amongst the study population was bleeding due to thrombocytopenia (TCP; 6.8%), followed by serositis (5.2%), acute respiratory distress syndrome or ARDS (4.4%), meningitis (2.8%) and subconjunctival hemorrhages (2.8%).

As seen in Table 7, complicated infections occurred in 30% of the population, out of which death occurred in 2 cases and no death in patients with uncomplicated infections.

Table 4. Clinical Features Amongst Study Population

Clinical features	Frequency	Percentage (%)
Fever	155	62
Vomiting	45	18
Nausea	77	30.8
Pain in abdomen	66	26.4
Arthralgia	41	16.4
Petechiae	65	26
Headache	82	32.8
Itching/pruritis	55	22
Difficulty in breathing	49	19.6
Abdominal distension	39	15.6
Hematemesis	4	1.6
Malena	15	6
Altered sensorium	7	2.8
Hemoptysis	18	7.2

Table 5. Type of Infections Amongst Study Population

Infections	Frequency	Percentage (%)
Dengue	20	8
Malaria	28	11.2
Leptospirosis	15	6
Enteric fever	13	5.2

Table 6. Medical Complications Amongst Study Population

Medical complications	Frequency	Percentage (%)
Serositis	13	5.2
Bleeding due to TCP	17	6.8
ARDS	11	4.4
MODS	5	2.0
Myocarditis	5	2.0
Meningitis	7	2.8
Encephalitis	3	1.2
Subconjunctival hemorrhages	7	2.8

Table 7. Comparison of Complication and Outcome Amongst Study Population

Complication	Frequency (%)	Survived (%)	Death (%)
Complicated infections	75 (30)	73 (97)	2 (3)
Uncomplicated infections	175 (70)	175 (100)	0 (0)
Total	**250**	**248**	**2**

DISCUSSION

In the present study, the most common age group amongst the study population was 20 to 24 years (41.6%), followed by 25 to 29 years (40%) and 30 to 35 years (18.4%). This finding is in line with a study by Chandrashekar et al which evaluated the incidence and severity of malarial anemia and associated risk factors among pregnant women. Of the 71 infected women, most (38%) were in the age group of 21 to 25 years.[11]

Most of the study population in our study had gestational age of 1 to 12 weeks (61.6%), followed by 13 to 28 weeks (31.6%) and more than 28 weeks (6.8%). Most of the study population had parity 2 (46.8%). The most common clinical features were fever (62%), headache (32.8%), nausea (30.8%), pain in abdomen (26.4%) and petechiae (26%), and most common type of infections were malaria (11.2%), dengue (8%), leptospirosis (6%) and enteric fever (5.2%). The risk of severe malaria among pregnant women is threefold higher than that among nonpregnant women. Moreover, a median maternal mortality of 39% has been noted in studies in Asia-Pacific.[12]

Most common medical complications amongst study population were bleeding due to TCP (6.8%), serositis (5.2%), ARDS (4.4%), meningitis (2.8%), subconjunctival hemorrhages (2.8%) and encephalitis (1.2%). Similarly, in the study conducted by Mousumi, complication like excessive bleeding was reported in about 87% of pregnant women in India in 2007-2008.[13]

CONCLUSION

Fever followed by headache were the most common manifestations of pregnant women with tropical infections. The most common type of infections were malaria, dengue, leptospirosis and enteric fever. The most common medical complications were bleeding due to TCP, followed by serositis, ARDS, meningitis, subconjunctival hemorrhage and encephalitis. Complicated infections were seen in 30%

of pregnant women in the tertiary care hospital in Mumbai, Maharashtra. Most of the study population had good recovery. Pregnancy is a condition in which immunity of the mother decreases with progression of pregnancy and with increasing maternal age and associated comorbidities. This immune status declines progressively, so the mother becomes more vulnerable to infections and diseases. So, all pregnant women must be evaluated at primary care centers properly in their antenatal visits for their parity status and any associated risk factors and diseases. By doing this, we can reduce many tropical infections, complications and maternal mortality in early stage of pregnancy.

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'Disease-Free India' Initiative by S-VYASA

An initiative called "Disease-Free India - Rog Mukt Bharat" has been initiated by Swami Vivekananda Yoga Anusandhana Samsthana (SVYASA). It is an internationally recognized university, well-known for its traditional treatments and yoga practices based on science.

The venture starts with the 'Swastha Shakti Program', an automatic computerized application that guides Indians through the proper practice of yoga, allowing them to heal and recover faster. As part of this effort, it will conduct well-being events, holistic offerings and masterclasses for 90 days.

At the INCOFYRA conference's 24th edition, Shri Thaawar Chand Gehlot, Governor of Karnataka, inaugurated the 'Disease-Free India' campaign. The general public will have access to free health check-ups and digital consultations for yoga, Ayurveda, naturopathy and meditation, as well as other holistic fitness solutions, hosted and maintained by S-VYASA professionals, as part of the wider program. Through yoga, accurate nutrition and mindfulness, the aim will be to deal with the essential reasons and treatment plans for diseases such as diabetes, hypertension, polycystic ovary syndrome (PCOS), polycystic ovary disease (PCOD) and attention-deficit/hyperactivity disorder (ADHD) amongst others, helping people to lead a disease-free healthier life. (*Source: ETHealthworld, May 27, 2022*)

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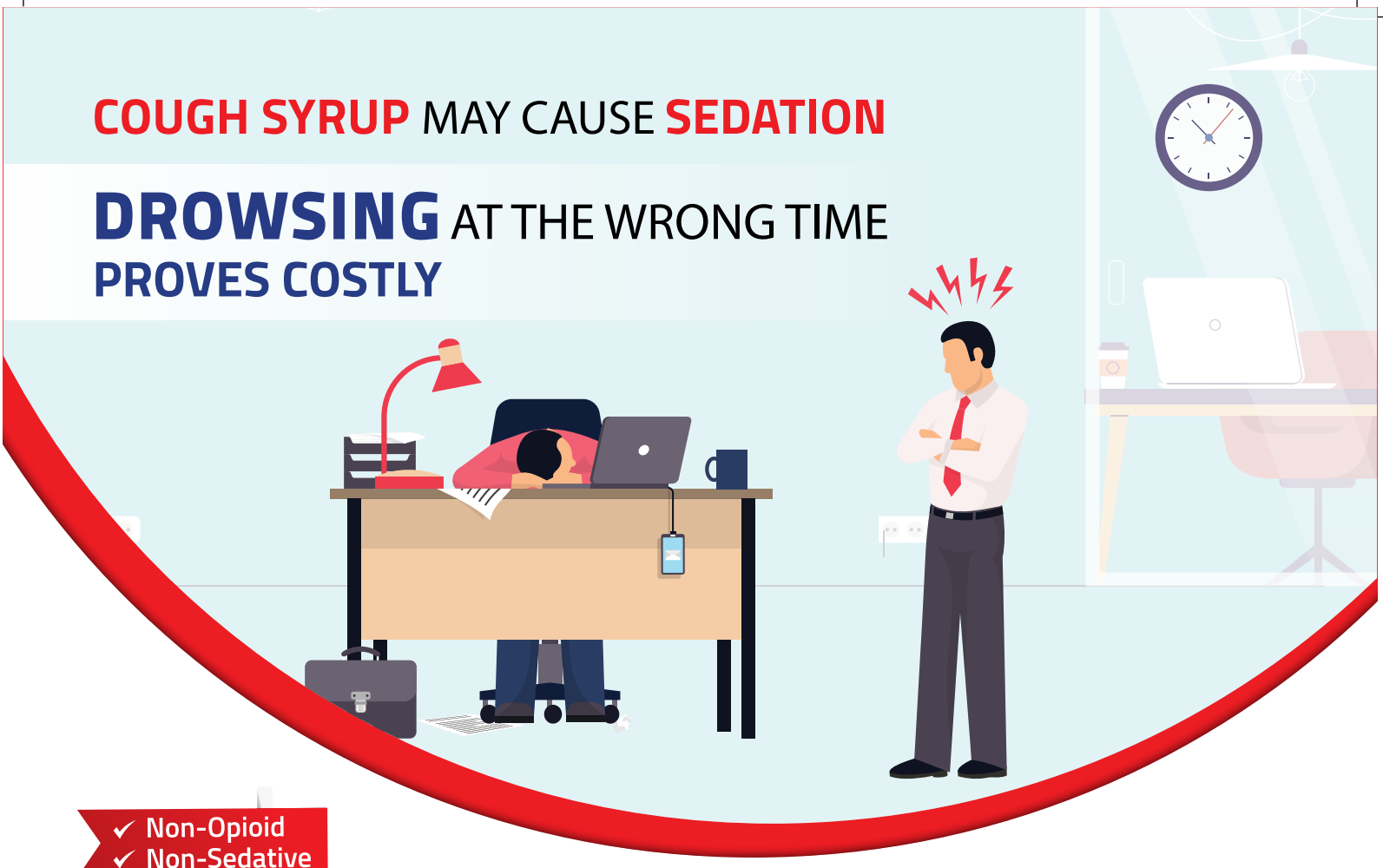

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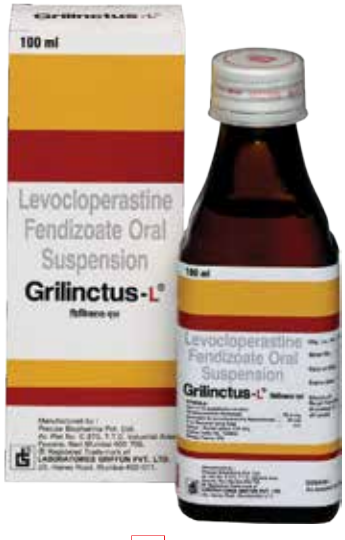

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CLINICAL STUDY

Study of Orthopedic Morbidities among Postmenopausal Women in a Medical College Hospital in Rural Area of Western Maharashtra, India

SHUBHADA SUNIL AVACHAT*, SHRIKANT BALKRISHNA DESHPANDE†, MRINAL BALBHIM ZAMBARE‡, DEEPAK BABURAO PHALKE#

ABSTRACT

Introduction: It is estimated that a total of 130 million Indian women are expected to live beyond menopause by 2015. Health of postmenopausal women is of growing concern because of increased longevity and various morbidities associated with old age. **Objectives:** 1) To assess various orthopedic problems among postmenopausal women in rural area. 2) To estimate magnitude of common orthopedic problems and associated sociodemographic factors. **Methodology:** A cross-sectional study was conducted at the medical college hospital in rural area of Western Maharashtra on 500 postmenopausal women availing healthcare in a medical college hospital. Data was collected with the help of predesigned questionnaire by interview technique and with the help of case records available from orthopedic department. **Results:** Backache (62%) and osteoarthritis (51.6%) were common orthopedic problems. Osteoarthritis was significantly associated with obesity.

Keywords: Postmenopausal women, orthopedic problems

Menopausal and postmenopausal health has emerged as an important concern owing to increased longevity and changing lifestyle of Indian women. It is estimated that a total of 130 million Indian women are expected to live beyond menopause by 2015.[1] The focus of women's health researchers and health policy planners has also shifted toward postmenopausal women since the trends suggest an increase in their numbers and life expectancy.[2]

Long-term consequences of changes in ovarian hormonal levels include morbidities associated with aging such as cardiovascular diseases, osteoporosis, problems related to memorization, urinary incontinence, skin aging and others.[3,4]

Postmenopausal women are generally affected by osteoporosis and fracture rates among them are approximately twice as high as men. The cause of osteoporosis is very complex but it is clear that hormonal changes after menopause increase the rate of bone resorption, leading to greater risk of osteoporosis. This silently progressing metabolic bone disease is widely prevalent in India and is a common cause of morbidity and mortality in women.[5] The occurrence of osteoporosis in postmenopausal women is a very common problem especially in India, as Indian women are exposed to many risk factors like low calcium diet, lack of exercise, family history and in general, lack of health awareness. The prevalence of osteoporosis increases with age and it is estimated that 70% of women over the age 80 years have osteoporosis.[6]

The problem of backache becomes more pronounced in postmenopausal women.[7] During this period of women's life, the likelihood of weight gain and manifestation of low back pain increases due to the changes of the muscles and skeleton structures as a result of aging, occupational or other factors. Osteoarthritis is also one of the common health problem among elderly women.

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Osteoarthritis strikes women more often than men and it increases in prevalence, incidence and severity after menopause.[8,9]

There is a growing recognition that various morbidities occur in postmenopausal age group, yet information on the levels and patterns of these health problems experienced by women in India is sparse. Only a few studies have been undertaken to understand the effects of menopausal transition in relation to aging process on general health profile of women in postmenopausal life. Since, a large proportion of women suffer morbidity silently and are reluctant to seek care or to visit clinics and hospitals, it is difficult to assess the true magnitude of the problem or the patterns of morbidity from which women suffer. Yet the small amount of data available suggest startlingly high levels of morbidity, for which treatment is rarely sought.

Because of inadequate medical facilities in rural areas and poor resources to obtain treatment from private medical practitioners, women in villages often become a victim of a number of health problems. Hence, studies are needed in rural areas to investigate physical, physiological and social changes experienced during the menopausal transitions along with the nature and magnitude of health problems during postmenopausal life. Orthopedic problems are very common after menopause and significantly affect the health of Indian women. Therefore, present study was conducted among postmenopausal women attending medical college hospital in a rural area to assess morbidity pattern with special reference to orthopedic morbidity.

METHODOLOGY

Study Design

A cross-sectional study.

Study Setting

Study was conducted in the Dept. of Orthopedics, Rural Medical College and Hospital during January 2010 to December 2010.

Sampling and Sample Size

All the women in postmenopausal age group attending orthopedic outpatient department (OPD) during study period and who were ready to participate were included in the study. Women who had not achieved menopause and who were not ready to participate were excluded from the study. Five hundred women of postmenopausal age who visited orthopedic department during study period were ready to participate, making the sample size 500.

Data Collection

After explaining purpose of the study and obtaining verbal consent, data was collected from them by interview technique. A predesigned, structured questionnaire was used to collect necessary information. Questions were mainly pertaining to their complaints related to orthopedic problems. The clinical findings and X-ray findings were obtained from individual case records prepared by resident doctors and other faculty members of orthopedic department. Modified BG Prasad's classification was used for determining economic status.[10]

Statistical Analysis

Data was tabulated and appropriate statistical analysis was done with the help of percentages and proportions. Test of significance was applied wherever required.

RESULTS

Our study was conducted among 500 women of postmenopausal age who visited orthopedic OPD during the study period. Majority of the women were from the age group of 55-65 years. Sixty-four percent women were married, 68.6% were illiterate and most of them were from low socioeconomic status (Table 1).

Majority of women seeking healthcare from orthopedic department had either joint pain (predominantly knee) or backache. Some of the women had backache as well as knee pain. Only few women in postmenopausal age group had other orthopedic complaints like fracture, sprain and ligament problems (Table 2).

Out of 500 women, 310 (62%) were suffering from backache. Degenerative disease (osteoporosis) was the most common cause of backache observed in our study. Common X-ray findings observed among our study subjects were osteoporotic changes in spine, osteophytes in vertebrae or wedge compression (Table 3).

Joint pain with predominant involvement of knee joint was another common symptom observed in our study participants. Out of 500 women having orthopedic problems, 258 (51.6%) were suffering from osteoarthritis. Reduction of medial joint space and reduction of bone trabeculae with increase in lucency were the X-ray

Table 1. Sociodemographic Profile of Study Participants

Age in years	No. of women
Age	
<50	9 (1.8%)
50-55	74 (14.8%)
55-60	111 (22.2%)
60-65	248 (49.6%)
65-70	47 (9.4%)
>70	11 (2.2%)
Total	**500**
Marital status	
Married	324 (64.8%)
Widow	159 (31.8%)
Unmarried	017 (3.4%)
Total	**500**
Educational status	
Illiterate	343 (68.6%)
Primary	118 (23.6%)
Secondary and higher secondary	37 (7%)
Graduate and above	2 (0.4%)
Total	**500**
Economical status	
Upper (I, II, III of BG Prasad)	186 (37.2%)
Lower (IV and V of BG Prasad)	314 (62.8%)
Total	**500**

Table 2. Symptom-wise Distribution of Patients (Multiple Response)

Symptoms	No. of patients
Backache	310
Joint pain	274
Others	053

findings observed in our study among patients suffering from knee joint pain. Body mass index of patients suffering from osteoarthritis was also calculated and it was observed that osteoarthritis was significantly associated with obesity in our study (Table 4).

Table 3. Distribution of Backache Patients According to Etiology (n = 310)

Age group (in years)	Degenerative disc disease (osteoporosis)	Facet joint arthopathy	Spondylo-listhesis
50-55	22	16	1
55-60	46	18	4
61-65	98	43	8
65-70	40	6	2
>70	5	0	1
Total	**211**	**83**	**16**

Table 4. Association of Osteoarthritis and Obesity

Osteoarthritis	No. of obese women	No. of nonobese women	Total
Present	147 (63.6%)	84 (36.4%)	231 (100%)
Absent	111	158	269
Total	**258**	**242**	**500**

$\chi^2 = 24.2$; d.f. = 1; $p < 0.001$; Highly significant.

DISCUSSION

The abrupt endocrine changes during menopausal transition have important impacts on the physiology of female body that exacerbate risks for many diseases and disabilities during postmenopausal life. Present study was conducted among 500 postmenopausal women to assess various orthopedic problems among them; majority of women in our study population were in the age group of 60-70 years (59%), illiterate (68.6%), and belonged to low economic status. Similar finding was observed by Mandal et al in their study, 58.6% women were in the age group between 60-70 years, 61% were illiterate and majority of them belonged to low economic status.[11]

Backache and joint pain as a manifestation of osteoporosis and osteoarthritis, respectively, were the most common problems among our study subjects. Similar finding was observed by Scharla et al in their study, 85.1% postmenopausal women had back pain and 41.8% had joint pain.[12]

Many studies showed that the prevalence of osteoarthritis increases in old age and more so in women than men. Females are found to have more severe osteoarthritis and involvement of knee joint is more common.[13-15]

In our study, osteoarthritis was present among 51.6% women. Obesity is a well-known risk factor for osteoarthritis and in our study also it was significantly common among obese women. Similar to our finding, the prevalence of osteoarthritis was 49% in the study conducted by Mandal et al[11] and 57% in the study conducted by Lena et al.[16]

CONCLUSION

Orthopedic morbidities are very common in postmenopausal women. Osteoporosis and osteoarthritis are the common orthopedic problems and large number of these health problems can be prevented and managed by simple measures like exercise, diet and proper healthcare.

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■■■■

Policy for Alternatives for Single-Use Plastic

Gopal Rai, Environment Minister, stated that the Delhi Government is planning to come up with a green start-up policy to promote alternatives for single-use plastics. A meeting was held at Delhi Secretariate with 17 start-ups and self-help groups proposing and displaying plastic alternatives such as carry bags, plastics, jute and other biodegradable materials. Rai stressed that the start-ups involved in manufacturing or marketing SUPs should have another source of income hence at the exhibition such opportunities can be explored by the company. Adding to the statement, Rai said that a public awareness campaign will be starting from June 1 to reduce the use of SUPs. He also added that MCD has already prepared a list of shops that sell single-use plastic to link them up with start-ups working on SUP alternatives. This step was taken to combat pollution, especially air pollution. However, the Government is coming up with solutions regarding two main obstacles in the process, i.e., Impact on income and Awareness of the alternatives. (*Source: https://health.economictimes.indiatimes.com/news/policy/delhi-to-come-up-with-policy-for-alternatives-to-single-use-plastic/91800089*)

CLINICAL STUDY

Vaginal Estrogen Therapy in Postmenopausal Overactive Bladder

MANIDIP PAL*, T DEB†

ABSTRACT

Objective: To assess the efficacy of vaginal estrogen therapy in postmenopausal overactive bladder (OAB). **Study design:** It is an OPD (outpatient department) based prospective study. Postmenopausal women attending gynecology OPD with complaint of OAB were enrolled for the study. Women fulfilling the criteria for the study were given estradiol 2 mg vaginal tablet everyday for 2 weeks, then weekly twice for 10 weeks. Patients were assessed by 3-day bladder diary, Patient Global Impression scale, before and after the therapy. **Results:** Ninety-three patients completed the study. Increased frequency of micturition was cured in 92.5% cases; urgency and urge incontinence was cured in 74.2% cases. Patient's subjective feeling of improvement scale revealed only 12.9% women felt either no change or little better; rest all were happy. **Conclusion:** Local estrogen therapy in postmenopausal women with OAB resulted in a good outcome.

Keywords: Overactive bladder, estrogen, vaginal

Menopause causes different types of morbidity in women's lives – urinary incontinence is one of them. Postmenopausal women many a times complain of frequency, urgency, urge incontinence (overactive bladder or OAB). While evaluating them, ruling out infectious etiology (urinary tract infection) is very important. Next to infection, hypoestrogenism is thought to be the major etiological factor. The present study evaluates the efficacy of local estrogen in treating postmenopausal OAB.

MATERIAL AND METHODS

The study was conducted in the Dept. of Obstetrics and Gynecology, College of Medicine and JNM Hospital, Kalyani, Nadia, West Bengal. It was an OPD (outpatient department) based prospective study. Postmenopausal women attending gynecology OPD with complaint of OAB were enrolled for the study.

Inclusion criteria were – 1) Patient should be at least 1 year postmenopausal; 2) increased frequency of micturition and nocturia (normal voiding habits ≤8 episodes/day and ≤2 episodes/night)[1]; 3) urgency of urination ± urge incontinence. Exclusion criteria were – 1) Undiagnosed vaginal bleeding; 2) endometrial hyperplasia, and other estrogen-dependent disease, especially malignancy; 3) hypertension (blood pressure systolic >160 mmHg, diastolic >100 mmHg); 4) previous thromboembolic episodes; 5) liver disease; 6) estrogen therapy within last 6 months.

Informed consent was obtained from all patients. All patients underwent a detailed history and clinical examination including breast, per abdominal, per vaginal examination, blood pressure measurement, etc. Complete blood count, liver and renal function tests, coagulation profile, Pap smear, pelvic ultrasonography were done for all the cases. Mid-stream urine culture and sensitivity was done routinely before starting estrogen therapy. If infection was present, it was cured with respective sensitive antibiotic. After that also, if OAB symptoms persisted then only vaginal estrogen therapy was started. Urodynamic study could not be done as there is no such facility in our setup. Patients were asked to maintain a 3-day bladder diary before starting therapy and also at the end of the therapy at 12 weeks. Estradiol vaginal tablet 2 mg was inserted in the posterior fornix every night for first 2 weeks; followed by weekly twice for 10 weeks. Total 12 weeks

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therapy was given. The effect of treatment on patients' perception of urgency was evaluated by asking each patient to complete a three-point urgency perception scale at baseline and 12 weeks following treatment.

Patients described their experience when they felt the desire to urinate. The response options included: 1) Unable to hold urine; 2) Usually able to hold urine until I reach the toilet if I go immediately and 3) Usually able to finish my work before going to the toilet.[2] Patient's feelings were also assessed by Patient Global Impression (PGI) scale.[3] At the starting of the study, PGI of Severity (PGI-S) scale measured the severity of the disease. The woman was asked to check the one number that best described how her urinary tract condition was now − 1) Normal, 2) mild, 3) moderate and 4) severe. It is a scale which measures the patient's subjective feeling about the severity of her condition. Result of the treatment is assessed by PGI of Improvement (PGI-I) scale at 12 weeks. This scale measures the patient's feeling of her OAB condition after the treatment – whether improved or not. Again she was asked to check the one number that best described how her urinary tract condition was now, compared with how it was before she began taking medication in this study – 1) Very much better; 2) much better; 3) a little better; 4) no change; 5) a little worse; 6) much worse and 7) very much worse.

RESULT

Hundred women were enrolled for the study. Four were unfit for estrogen therapy after investigations. Three were lost to follow-up. Total 93 women completed the trial. At the beginning of the study, increased

Table 1. Frequency of Micturition, Nocturia and Nocturnal Enuresis Before and After Therapy

Frequency of micturition	No.	%	Nocturia	No.	%
At starting			**At starting**		
9-15 times	38	39.6	3-4 times	13	13.5
16-20 times	43	44.8	5-6 times	4	4.2
>20 times	15	15.6	**Total**	**17**	**17.7**
Total	**96**		**After 12 weeks of therapy**		
After 12 weeks of therapy			3-4 times	2	11.8 (2/17)
≤8 times	86	92.5	**Nocturnal enuresis**		
9-15 times	7	7.5	At starting	5	5.2
Total	**93**		After 12 weeks of therapy	0	0

Table 2. Urgency and Urge Incontinence

	No.	%
At starting		
I am usually not able to hold urine	84	87.5
I am usually able to hold urine until I reach the toilet if I go immediately	12	12.5
I am usually able to finish my work before going to the toilet	0	0
Total	**96**	**100**
After 12 weeks of therapy		
I am usually not able to hold urine	23	24.7
I am usually able to hold urine until I reach the toilet if I go immediately	1	1.1
I am usually able to finish my work before going to the toilet	69	74.2
Total	**93**	**100**

Table 3. Patient Global Impression Scale

	No.	%
Patient Global Impression of Severity (PGI-S) scale (at the beginning)		
Normal	0	
Mild	19	19.8
Moderate	56	58.3
Severe	21	21.9
Total	**96**	**100**
Patient Global Impression of Improvement (PGI-I) scale (after 12 weeks of therapy)		
Very much better	69	74.2
Much better	12	12.9
A little better	7	7.5
No change	5	5.4
A little worse		
Much worse		
Very much worse		
Total	**93**	**100**

frequency of micturition >20 times was present in 15.6% cases, nocturia in 17.7% cases and nocturnal enuresis in 5.2% cases. Eighty-four (87.5%) patients had urge incontinence. Patient's subjective feeling revealed that 21.9% had severe problem.

At the end of 12 weeks of vaginal estrogen therapy, 92.5% women had no more increased frequency of micturition. There was no case of nocturnal enuresis. Urgency and urge incontinence was cured in 74.2% cases. Patient's subjective feeling of improvement scale revealed only 12.9% women felt either no change or little better; rest all were happy (Tables 1-3).

DISCUSSION

Local estrogen therapy in postmenopausal women resulted in a good outcome in relation to their improvement in OAB problem.

Hypoestrogenism affects the sensory threshold of the urinary tract, and this reduces the volume and time needed to change the first sensation to void into the feeling of imminent micturition, and in some subjects causes involuntary detrusor contraction.[4] This could be the reason why estrogen therapy helped in reducing the OAB symptoms in postmenopausal women.

Various studies have demonstrated that estrogen replacement can improve, or even cure, urinary stress and urge incontinence. High-dose estrogen can decrease the total number of voids in a 24-hour span, including nocturnal voids.[5] Cochrane database review 2009 also revealed that estrogen therapy can cure or improve urinary incontinence in women, especially urge incontinence.[6]

In evaluation of estradiol absorption from vaginal tablets in postmenopausal women, it was found that absorption of the drug is not so high to cause systemic side effect. Over 12 weeks of therapy also, absorption patterns remained consistent, and there were no accumulations of circulating E2.[7]

Cardozo et al[8] had performed a systematic review of the effects of estrogen therapy on symptoms suggestive of OAB in postmenopausal women. Eleven randomized trials were identified where total of 430 subjects were included. Estrogen (estriol, estradiol, conjugated estrogens or combination of estradiol and estriol) systemic or local vs. placebo was reviewed. Overall, all of the outcome variables, which included diurnal and nocturnal frequency, urgency, number of incontinence episodes, first sensation to void and bladder capacity,

were significantly improved in patients given active treatment compared with those taking placebo. When the authors analyzed data separately for systemic and local therapies; however, they found that only numbers of incontinence episodes and first sensation to void were significantly improved in patients taking systemic treatment, whereas local treatments had beneficial effects on all outcomes. Based on these findings, it was concluded that estrogen therapy may be effective in relieving the symptoms suggestive of OAB, but local administration may be the most effective route of administration.

In light of available evidence, it seems preferable to use vaginal estrogens rather than systemic for the management of menopause-related bladder problems.[9]

In our study, though 100 patients were initially recruited, 93 could complete the whole course. Other studies on effect of vaginal estrogen on urinary incontinence in postmenopausal women had sample sizes of 40 (Enzelsberger et al,[10] used estriol cream 1 mg/day, 3 mg/day), 59 (Nelken et al,[11] estradiol vaginal ring vs. oral oxybutynin), 110 (Cardozo et al,[12] used 17-beta estradiol tablet) cases.

CONCLUSION

The bladder and its surrounding structures are rich in estrogen receptors and there are demonstrable physiological and anatomical changes that occur around and immediately after menopause. The prevalence of many bladder symptoms, such as frequency, urgency and incontinence (OAB) does seem to increase around menopause. Hence estrogen therapy, especially vaginal therapy which has less systemic side effects than oral form, appears to be helpful in managing such situation.

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CLINICAL STUDY

Correlation of Vitamin D Levels with COVID-19 Severity and Outcome

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ABSTRACT

Background and aims: Low vitamin D levels have been associated with an increase in inflammatory cytokines and a significantly increased risk of pneumonia and viral upper respiratory tract infections. Vitamin D deficiency is associated with an increase in thrombotic episodes, which are frequently observed in coronavirus disease 2019 (COVID-19). These conditions are reported to carry a higher mortality in COVID-19. So, we conducted a study to prove the correlation of vitamin D levels with COVID-19 infection and severity. **Material and methods:** The present study was conducted at RNT Medical College, Udaipur, Rajasthan. This study was done over a period of 2 months after getting approval from Institutional Ethics Committee. Written and informed consent was obtained from patients. In this study, 81 patients admitted in COVID wards and ICU, with COVID reverse transcriptase-polymerase chain reaction (RT-PCR) positive reports were included. **Results:** Out of a total 81 patients, 37 (45.7%) were in the 41-60 years age group, 29 (35.8%) were more than 60 years of age and 15 (18.5%) were less than 40 years of age. Seventeen patients had severe vitamin D deficiency, 27 patients had moderate vitamin D deficiency, 20 patients had mild vitamin D deficiency and 17 patients had normal vitamin D level. Out of 17 patients who had severe vitamin D deficiency, 11 (64.7%) patients required invasive mechanical ventilation and out of these 17 patients, 13 (76.47%) patients died. Out of 17 patients who had normal level of vitamin D, 16 (94.1%) maintained SpO_2 at room air and only 1 patient required invasive mechanical ventilation. As the level of vitamin D increased from severely low to normal level, requirement of high oxygen support decreased and SpO_2 at room air increased. Mean of vitamin D among the patients who died was 10.4963 while mean of vitamin D level among patients who survived and were discharged was 27.2362. All 17 patients who had normal level of vitamin D were discharged from the hospital. Mean of serum ferritin and mean of interleukin (IL)-6 was high in patients who died and low in patients who were discharged. **Conclusions:** Vitamin D level plays an important role in COVID-19 disease. Vitamin D have significant role in protection from severe form of disease.

Keywords: COVID-19, vitamin D, T regulatory lymphocytes, acute respiratory distress syndrome, IL-6, serum ferritin

The severity of coronavirus disease 2019 (COVID-19) is influenced by several factors, including the evidence of pneumonia, severe acute respiratory distress, myocarditis, microvascular thrombosis and/or cytokine storm. All these conditions have underlying inflammation. A major defense against inflammation, and viral infection in general, is the T regulatory lymphocytes (Tregs). It has been reported that Treg levels can be low in COVID-19 patients and can be increased with vitamin D supplementation.[1] Treg levels can be particularly lower in severe COVID-19 infection.[2] Low vitamin D level has been tied to an increase in inflammatory cytokines as well as a significant increase in the risk of pneumonia and viral respiratory tract infections. Additionally, vitamin D deficiency has also been tied to an escalation in thrombotic episodes, often seen in patients with COVID-19.[1]

Deficiency of vitamin D is common in patients with obesity and diabetes. Moreover, these are among the conditions known to be associated with a higher mortality in COVID-19.[1]

MECHANISMS THAT LINK COVID-19 WITH VITAMIN D

The COVID-specific CD8 T cells and the specific antibodies produced by B cells are vital to eliminate the virus. However, unchecked non-specific inflammation and production of cytokines can result in injury to the lungs and other vital organs. Thus, limiting the early

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non-specific inflammation during COVID-19 illness may give time to the specific acquired immunity to develop.

As mentioned earlier, Treg levels have been reported to be low in some COVID-19 patients, and are markedly reduced in severe cases.[2] In a study by Johnstone et al conducted among older nursing home patients, high Treg blood levels were found to be tied to decreased risk of respiratory viral disease.[3] This implies that if Treg levels are increased, it may prove to be beneficial for decreasing the severity of viral disease and possibly of COVID-19 as well.

Vitamin D supplementation can increase Treg levels in both healthy individuals as well as those with autoimmune disorders.[4,5] Low levels of vitamin D are associated with a significantly increased risk of pneumonia and viral respiratory tract infections.[6,7]

Low vitamin D levels are tied to an increase in inflammatory cytokines. In healthy individuals, researchers have noted a significant inverse relationship between the serum 25-hydroxyvitamin D [25(OH)D] and tumor necrosis factor (TNF)-α.[8] The levels of interleukin (IL)-6 have been found to be increased in those who were vitamin D deficient.[9] Several animal studies and *in vitro* cell models have shown vitamin D3 to down-regulate the production of inflammatory cytokines, such as TNF-α and IL-6, while increasing inhibitory cytokines.[10] All these observations suggest that adequate levels of vitamin D can potentially decrease the incidence of cytokine storm, which is seen in COVID-19.

Thrombotic complications are also frequently encountered in COVID-19 patients.[11]A large number of patients with COVID-19 have been found to have elevated D-dimer levels. Vitamin D is known to regulate thrombotic pathways, and the deficiency of this vitamin is associated with an increase in thrombotic episodes.[12] Vitamin D deficiency has also been found to occur more frequently in patients with obesity and diabetes.[13] These conditions are associated with higher mortality in COVID-19 patients.

MATERIAL AND METHODS

The present study was conducted at RNT Medical College, Udaipur, Rajasthan. This study was done over a period of 2 months after getting approval from Institutional Ethics Committee. Written and informed consent was obtained from patients. In this study, 81 patients admitted in COVID wards and intensive care unit (ICU), with COVID reverse transcriptase-polymerase chain reaction (RT-PCR) positive report, were included.

Patients admitted in COVID ICU and wards were tested for vitamin D level. Patient were grouped into: severe deficiency of vitamin D <10 ng/mL, moderate deficiency of vitamin D 10-20 ng/mL, mild deficiency of vitamin D 20-30 ng/mL and normal level >30 ng/mL. Association of vitamin D level was tested with outcome of patient in the form of discharge and death and maintenance of SpO_2 level.

RESULTS

In the present study, out of total 81 patients 37 (45.7%) were in the 41-60 years age group, 29 (35.8%) were more than 60 years of age and 15 (18.5%) were less than 40 years of age. Most of patients were male (n = 59), 72.8% and 27.2% (n = 22) were female (Table 1).

Table 2 depicts the association of vitamin D level and SpO_2 maintained by patients. Among the patients who had severe vitamin D deficiency, all patients (100%) required mechanical ventilation. Out of 17 patients who had normal level of vitamin D, 16 (94.1%) maintained SpO_2 at room air. As the level of vitamin D increased from severely low to normal level, requirement of mechanical ventilation decreased. This association of vitamin D level and SpO_2 maintained by patients was found to be statistically significant, with Chi-square 88.163 and p value <0.0001.

Table 3 depicts means of vitamin D level as per the outcome of death and discharge. The mean of vitamin D level among the patients who died was 10.4963, while mean of vitamin D level among patients who survived and were discharged was 27.2362. As depicted in the table, patients who survived and were discharged had high mean level of vitamin D and patients who died had low mean level of vitamin D. The difference in mean of vitamin D level with outcome was statistically significant with p value 0.0015.

Table 1. Distribution of Study Participants According to Age and Gender (n = 81)

Age Group	Frequency	Percentage (%)
Age Group (Years)		
<40	15	18.5
41-60	37	45.7
>60	29	35.8
Gender		
Male	59	72.8
Female	22	27.2

Table 2. Association Between Vitamin D Level and Peak Requirement of Oxygen Support in COVID RT-PCR Positive Patients (n = 81)

	Peak requirement of oxygen support				Total	Chi-square and p value
	Room air	Nasal prong/ mask	NIV	Invasive mechanical ventilation		
Vitamin D level (ng/mL)						
0-10	0 (0.0%)	0 (0.0%)	6 (35.29%)	11 (64.7%)	17 (100.0%)	88.163,
11-20	5 (18.5%)	6 (22.2%)	14 (51.9%)	2 (7.4%)	27 (100.0%)	<0.0001
21-30	12 (60.0%)	2 (10.0%)	5 (25.0%)	1 (5.0%)	20 (100.0%)	
>30	16 (94.1%)	0 (0.0%)	0 (0.0%)	1 (5.9%)	17 (100.0%)	
Total	**33 (40.7%)**	**8 (9.9%)**	**25 (30.9%)**	**15 (18.5%)**	**81 (100.0%)**	

Table 3. Association Between Mean of Vitamin D Level and Outcome of Death and Discharge (n = 81)

Outcome	Mean	N	SD	P value
Death	10.4963	18	5.76154	t = 3.3002
Discharge	27.2362	63	20.00015	0.0015
Total	**23.9295**	**81**	**19.26664**	

Table 4. Association Between Different Vitamin D Levels and Outcome of Death and Discharge (n = 81)

	Outcome		Total	Chi-square and p value
	Death	Discharge		
Vitamin D level (ng/mL)				
0-10	13 (76.47%)	4 (23.53%)	17 (100.0%)	29.018,
11-20	4 (14.8%)	23 (85.2%)	27 (100.0%)	<0.0001
21-30	1 (5.0%)	19 (95.0%)	20 (100.0%)	
>30	0 (0.0%)	17 (100.0%)	17 (100.0%)	
Total	**18 (22.2%)**	**63 (77.8%)**	**81 (100.0%)**	

Table 4 depicts the association of vitamin D levels and outcome of patients in form of death and discharge of patients. Out of 17 patients who had severely low vitamin D level, 13 (76.47%) patients died. All 17 patients who had normal level of vitamin D were discharged from hospital. As the level of vitamin D increased from severely low to normal level, chance of survival and discharge increased. This association of vitamin D level and outcome of patients in form of death and discharge of patients was found statistically significant, with Chi-square 29.018 and p value <0.0001.

Table 5 depicts that the mean of inflammatory marker IL-6 among the patients who died was 58.3231, while mean of IL-6 among patients who survived and were discharged was 40.7815. As depicted from the table, patients who survived and were discharged had low mean level of IL-6 and patients who died had high mean level of IL-6. However, the difference in mean of IL-6 level with outcome was statistically insignificant with p value 0.440.

Table 5 also depicts that the mean of inflammatory marker serum ferritin among the patients who died was 1050.7375, while mean of serum ferritin among patients who survived and were discharged was 459.0000. As depicted in the table, patients who survived and were discharged had low mean level of serum ferritin and patients who died had high mean level of serum ferritin. The difference in mean of serum ferritin level with outcome was found statistically significant with p value 0.001.

Table 5. Association Between Inflammatory Markers (IL-6 and Serum Ferritin) and Outcome of COVID RT-PCR Positive Patients (n = 81)

	Outcome		't' value and p value
	Death	Discharge	
IL-6			
Mean	58.3231	40.7815	t = 0.7752
N	16	65	p = 0.440
SD	60.3941	85.2127	
Serum ferritin			
Mean	1050.7375	459.0000	t = 4.4711
N	16	65	p = 0.001
SD	644.5592	425.5343	

DISCUSSION

The present study was conducted at RNT Medical College, Udaipur, Rajasthan. In the present study, out of total 81 patients, 37 (45.7%) were in the 41-60 years age group, 29 (35.8%) were more than 60 years of age and 15 (18.5%) were less than 40 years of age. In our study, the association of vitamin D level and SpO_2 of patients was found to be statistically significant. It was observed that if patients had normal level of vitamin D, they maintained SpO_2 with room air/nasal prong/mask (low oxygen support) and they did not get severe form of disease. As depicted in our study, patients who survived and were discharged had high mean level of vitamin D and low mean level of serum ferritin and IL-6 and patients who died had low mean level of vitamin D and high mean level of serum ferritin and IL-6.

The difference in mean of vitamin D level with outcome and serum ferritin level with outcome was statistically significant. It was interpreted that if the patients had high mean level of vitamin D and low mean level of serum ferritin and IL-6, they had less severe disease, or in other words, patients who had low level of vitamin D and high level of serum ferritin and IL-6 had more severe disease and higher death rate.

In the present study, it was found that as the level of vitamin D increased from severely low to normal level, chance of survival and discharge increased. This association of vitamin D level and outcome of patient in the form of death and discharge of patients was found statistically significant. It was interpreted that patients who had severe vitamin D deficiency had more chance of severe disease and death.

CONCLUSIONS

In the present study, it was interpreted that vitamin D levels play an important role in COVID-19 disease. Vitamin D has a significant role in protection from severe form of the disease. Patients who have severe vitamin D deficiency have more chance of severe disease, more chance of requiring high oxygen support to maintain SpO_2 and have more chance of mortality from COVID-19.

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Shots Don't Prevent Older Adults Against Long COVID

Research conducted in the US provided fresh evidence that long COVID can happen even after infections in vaccinated people with older adults at higher risk of long-term side effects. In the study, one-third of the elderly population showed signs of long COVID. A separate report published by CDC showed that after breakthrough infection 1 in every 4 adults aged 65 and above had 1 potential long COVID symptom in comparison to every 5th younger adult. The coronavirus vaccine helps in preventing initial infection and serious outcomes. About 1% of individuals develop a breakthrough infection, according to the study results published in *Nature Medicine* in which 13 million veteran reports were reviewed.

Overall, 32% had long COVID symptoms for up to 6 months in comparison to 36% of unvaccinated veterans after breakthrough infection. Long COVID symptoms such as breathing problems, and muscle aches, were the most common conditions. Strokes, brain fog and kidney failure were the high-risk factors observed among older adults. The author stated that this stressed the need to hasten long-term care for older adults along with the routine assessment of all COVID patients. (*Source: https://www.hindustantimes.com/lifestyle/health/long-covid-affects-more-older-adults-shots-don-t-prevent-it-101653540056217.html*)

Correcting Blood Sugar Levels can Improve Obesity-related Fertility Issues

A study published in *The Journal of Endocrinology* showed the association between the altered levels of the reproductive hormone in mouse modern of obesity can be restored by reducing blood glucose levels. Several studies have highlighted the need for effective therapy in obese women facing fertility issues due to imbalance in reproductive hormones. Hence, the development of an effective therapy that treats obesity along with metabolic health is a major advancement in the field of medicine. Dapagliflozin is a common drug used to treat type 2 diabetes, where it reduces blood glucose levels and has a positive effect on other metabolic health factors. In the study, the researchers investigated the effect of dapagliflozin on metabolic health and reproductive hormones in mouse models of obesity. After 8 weeks of application, blood glucose levels, body mass index (BMI) and reproductive cycles were normalized with the hormone imbalance and ovulation restored in comparison to non-treated mice.

Professor Chen, the lead researcher stated that normalized blood glucose metabolism with dapagliflozin in obese mice is a promising development toward restoring reproductive functions. However, further examination is needed to understand the therapeutic benefits, target molecules, molecular pathways involved, etc. to better treat fertility issues among women. (*Source: https://www.hindustantimes.com/lifestyle/health/research-correcting-blood-sugar-levels-can-improve-obesity-related-fertility-issues-101653539743483.html*)

Pfizer: COVID-19 Vaccine Shows Robust Response in Children

Pfizer/BioNTech reported that 80% efficacy of its vaccine was demonstrated in 3 doses for toddlers and children below 5 years. The study included 1,678 children during the pandemic period when Omicron was predominant. Based on the study data Pfizer plans to submit an application for the Emergency Use Authorization (EUA) to the US FDA. Earlier Pfizer asked the US FDA to authorize its vaccine for younger children but delayed its application after the trial data for 2 vaccination doses did not produce a significant immune response. Although the safety of the vaccine was similar to the placebo. The US FDA advisory board meeting is scheduled on June 15th to evaluate and authorize their recommendations for the mRNA vaccines in children under 6 years old. The doses recommended for children from 6 months to 5 years are 3 μg, i.e., 1/10th of the vaccination dosage administered to an adult. (*Source: https://www.medscape.com/viewarticle/974473?src=*)

CASE REPORT

Multi-organ Injuries Due to a Lightning Strike: A Rare Case

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ABSTRACT

Injuries due to a lightning strike are uncommon presentations in the emergency department. Common injuries caused by lightning include burns, muscle pains, cardiac arrest, hearing loss, seizures, behavioral changes and ocular cataracts. We report a case of a 26-year-old primigravida with history of 3 months of amenorrhea who was struck by lightning as she was standing beside a tree. It left her unconscious, immediately after which she was taken to the emergency department of Maharana Bhupal Govt Hospital (MBGH Hospital), Udaipur, Rajasthan. Entry wound was from right ear and the exit wound was on abdomen. Examination confirmed linear first- and superficial second-degree burns. The electrocardiogram (ECG) showed deep and symmetrical T-wave inversion in precordial and lateral leads. There was an associated elevation of troponin T levels (peak: 432 ng/L), suggestive of myocarditis. On otoscopic examination, she was found to have rupture of tympanic membrane bilaterally. A transthoracic echocardiography revealed reduced ejection fraction of the left ventricle to 25% with global left ventricle hypokinesia, moderate mitral regurgitation and tricuspid regurgitation. This case aims to raise awareness among the healthcare providers regarding multiple organ involvement in lightning injury.

Keywords: Lightning, seizures, myocarditis, echocardiography

Lightning injuries are injuries caused by a lightning strike. An interdisciplinary approach towards patients with muti-organ injuries following lightning strike is significant. Lightning strike is a common cause of sudden cardiac death and is also associated with injuries to several organ systems.[1,2] Lightning injuries are divided into direct strikes, side splash, contact injury and ground current.[3]

Presented here is the case of a 26-year-old woman who was struck by lightning and developed multi-organ injuries.

CASE REPORT

A 26-year-old primigravida with history of 3 months of amenorrhea was struck by lightning as she was standing beside a tree which left her unconscious. She was immediately taken to the emergency department of Maharana Bhupal Govt Hospital (MBGH Hospital), Udaipur, Rajasthan, where she was assessed and admitted in ICU under Department of Medicine.

On examination, her clothes were partially burned. Her vitals on admission were blood pressure 84/56 mmHg, respiratory rate 30 cycles/min, pulse rate 132 beats/min and of low volume. She was put on vasopressor support and was maintaining saturation with 10 L oxygen via face mask. Her Glasgow Coma Scale (GCS) was E2V1M5, pupils were reactive bilaterally and bilateral plantar was extensor, suggestive of brain insult.

Entry wound was from right ear and the exit wound was on abdomen (Fig. 1 a and b). Examination revealed linear first- and superficial second-degree burns. Some blisters were noted on a line traversing from the right ear to abdomen.

The electrocardiogram (ECG) showed deep and symmetrical T-wave inversion in precordial and lateral leads (Fig. 2). There was an associated elevation of troponin T levels (peak: 432 ng/L), suggestive of myocarditis. Laboratory investigations revealed a normal blood count (Hemoglobin – 13 g/dL, white blood cell [WBC] - 13,200, platelet count - 1,80,000), normal renal (Urea - 36, creatinine - 1.24) and liver function tests (SGOT - 38, SGPT - 45, ALP - 54, total protein - 7.4, albumin - 2.8) and no electrolyte abnormalities.

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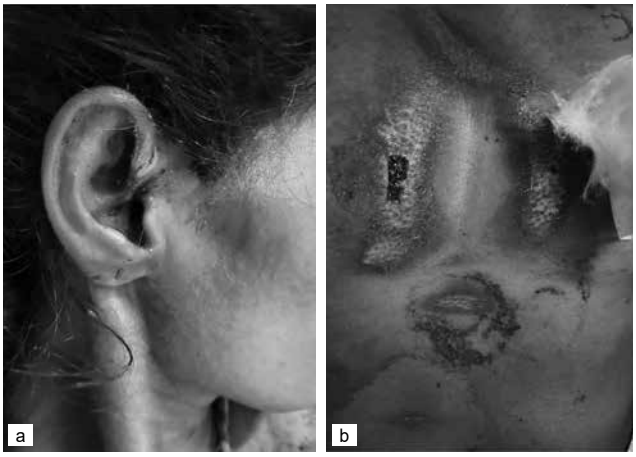

Figure 1 a and b. Entry and exit wounds.

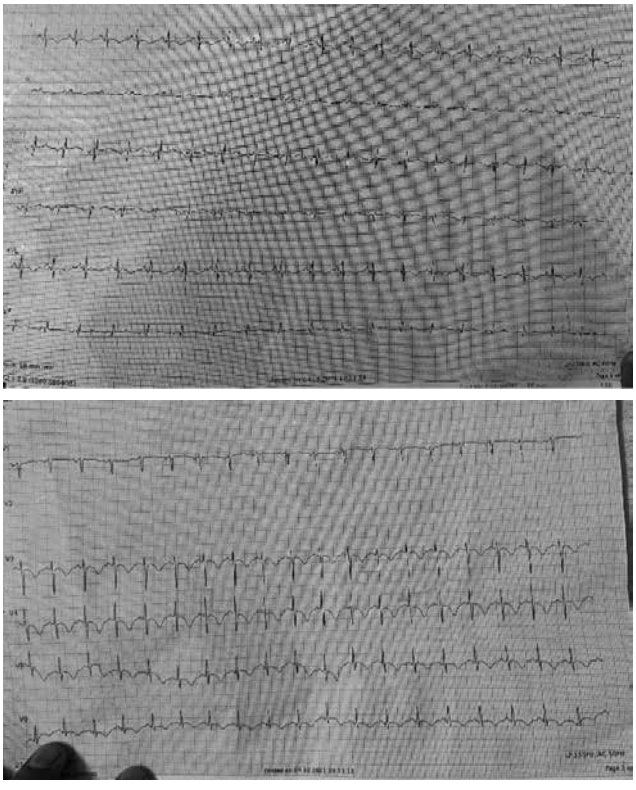

Figure 2. ECG of the patient.

A transthoracic echocardiography revealed reduced ejection fraction of the left ventricle to 25% with global left ventricle hypokinesia, moderate mitral regurgitation and tricuspid regurgitation.

On third day, she started obeying commands and taking food orally, but complained of difficulty in hearing. She was referred to the Department of ENT. On otoscopic examination, she was found to have rupture of tympanic membrane bilaterally. Pure tone audiometry revealed bilateral moderate-to-severe mixed type of hearing loss (Fig. 3) and the patient was advised tympanoplasty.

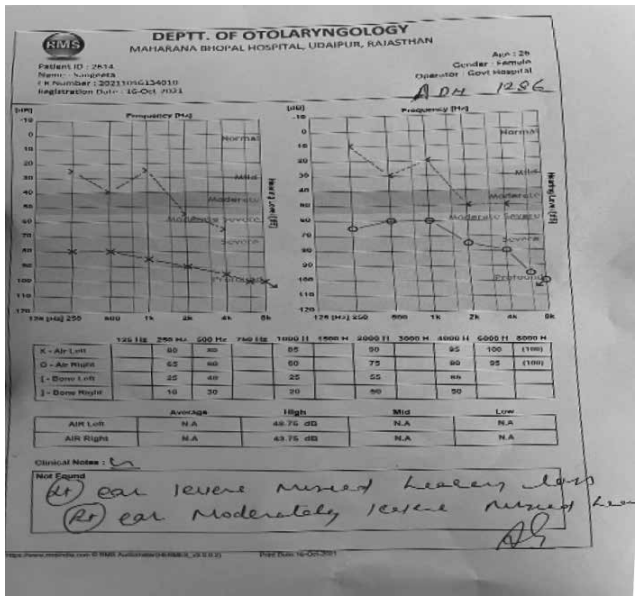

Figure 3. Mixed type hearing loss on audiometry.

On the same day, she complained of bleeding per vagina for which she was referred to Department of OBG. Patient had missed abortion and was terminated medically.

The cardiopulmonary function was monitored at the ICU for 4 days. Hemodynamic parameters became stable and she was weaned off from vasopressor and oxygen support.

She was shifted to medicine ward and noncontrast computed tomography (NCCT) head was done, which did not reveal any significant abnormality.

For the burn injuries, the patient underwent conservative management. Dressing was changed daily using a paraffin gauze dressing and topical hyaluronate. She was discharged from the hospital after 7 days and advised to follow-up in medicine OPD.

DISCUSSION

Lightning injuries are categorized primarily into direct strikes, side splash, contact injury and ground current. Ground current accounts for about 50% of cases of lightning injuries and occurs when the lightning strikes near an individual and travels to the person via ground. Side splash accounts for about one-third of cases and occurs when lightning strikes nearby and jumps to a person.

Contact injury occurs when an individual is touching an object that has been struck by lightning. Direct strikes account for just 5% of these injuries and occur when lightning directly strikes an individual.

The mechanism of lightning injuries may include electrical injury, burns due to heat and mechanical trauma. Lightning injury is diagnosed on the basis of history of the injury and examination.[3] A direct strike can cause lethal injuries.

Lightning strike patients can present with injuries to several organ systems. Neurological and cardiological complications have often been reported with lightning strike.[4]

The common injuries associated with lightning strike include burns, cardiovascular disorders, neurological disorders, kidney failure and psychological trauma.

Cardiological manifestations of a lightning strike may include myocardial necrosis and rhythm abnormalities. Cardiac arrest and ventricular fibrillation usually have lethal consequences if the patient is not immediately resuscitated. ECG may show mimicking acute coronary syndrome, arrhythmias, myocarditis. Takotsubo cardiomyopathy has been reported following lightning strike.[2]

Neurological manifestations after a lightning strike can range from transient benign symptoms to permanent damage. There may be a temporary loss of consciousness, amnesia, paresis, encephalopathy, etc. Electric current can damage the structural integrity of nerve membranes and muscle tissues.[5]

Burns caused due to a lightning strike are usually superficial second-degree burns and extensive tissue damage or large cutaneous burns are rarely seen. Management of such patients is the same as any other burn victim.

A characteristic skin alteration seen in patients with lightning injuries are Lichtenberg figures, where a transient reddish, fern-like pattern develops on the skin due to lightning strike.[6,7]

Renal failure can be seen in patients with lightning strike on account of myoglobinuria.[8] Renal function of patients struck by lightning should monitored regularly. Our patient had transient episode of oliguria which subsided with fluid therapy.

Psychological impairment is also possible in patients with lightning injury. The neuropsychological and cognitive deficits seen in these patients resemble those observed in traumatic brain injury or post-traumatic stress disorder.[8]

CONCLUSION

This case describes multi-organ injuries in a patient struck by lightning and emphasizes the need for evaluating all possible injuries that can occur due to lightning. Interdisciplinary management of multi-organ injuries due to lightning strike is highly important for early detection and management of the injury.

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CASE REPORT

Pregnancy with Eisenmenger Syndrome: A Challenge to Obstetrician

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ABSTRACT

Eisenmenger syndrome is defined as the development of pulmonary hypertension in response to a left-to-right cardiac shunt with consequent bidirectional or reversal (right-to-left) of shunt flow. Maternal mortality in the presence of Eisenmenger syndrome is reported to be 30-50%. If the patient continues her pregnancy against advice, a well-coordinated multidisciplinary team approach is advocated. Here, we report a case of pregnancy with Eisenmenger syndrome and its successful outcome.

Keywords: Pregnancy, Eisenmenger syndrome, maternal mortality

Congenital heart disease patients are reaching reproductive age due to improved healthcare facilities and more of them are conceiving. Eisenmenger syndrome involves pulmonary hypertension with a reversed or bidirectional shunt at the atrial, ventricular or aortopulmonary level.

Eisenmerger syndrome in pregnancy is usually associated with high mortality rates of around 30-50%.

Such patients are advised against pregnancy or to interrupt pregnancy before 10th gestational week, but if they continue pregnancy against advice, a well-organized multi-specialist care is required.

Here, we report a successful pregnancy in a woman with Eisenmenger syndrome.

CASE REPORT

A 30-year-old woman, $G_3P_1A_1$, gestational age (GA) 36 weeks, presented to our setting with chief complaints of pain abdomen for 6 hours and breathlessness (dyspnea on less than ordinary activity and orthopnea) for 3 days. She had marked limitation of physical activity (New York Heart Association [NYHA] Class III).

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Obstetric history: Previous lower segment cesarean section (LSCS) 4 years back (Indication – cephalopelvic disproportion [CPD]), miscarriage in first trimester 3 years back.

Past history: She had no history of dyspnea previously. She had a previous uneventful cesarean section. Her symptoms were much worse in this pregnancy.

Recently diagnosed with pulmonary arterial hypertension (PAH) and atrial septal defect (ASD).

Echocardiography revealed moderate-sized ASD, severe PAH, moderate pulmonary regurgitation (PR) and tricuspid regurgitation (TR). Routine antenatal investigations were within normal limits.

General examination: Blood pressure (BP) - 124/80 mmHg, pulse rate - 92/min, Pallor +, edema -, cyanosis ++.

Systemic examination: *CVS:* S1 normal, S2 single-narrow split, pulmonary ejection systolic murmur, enlarged right heart.

P/A: Uterus 36 weeks size, longitudinal, cephalic, moderate contractions, FHS + tachycardia, scar tenderness present. As per cardiological review, she was treated with propped up position and oxygen inhalation. Injection ampicillin 2 g and injection gentamicin 80 mg were given as infective endocarditis prophylaxis.

Decision for emergency LSCS was taken. Her cesarean section was performed. A healthy baby of weight 2.9 kg was born. Her bilateral tubal ligation was performed. Intraoperative and postoperative period was uneventful. Continuation of same cardiac treatment was done. Patient was discharged on 8th post-op day in a good condition with a healthy baby.

DISCUSSION

The hemodynamic changes occurring in pregnancy are not well-tolerated among women with Eisenmenger syndrome. Most women with Eisenmenger syndrome have a delicately balanced state and this balance must not be disrupted. In women with Eisenmenger syndrome and a low cardiac output state, the right ventricle is compromised, which may fail to meet the demands of increasing blood volume and cardiac output in pregnancy.

A fixed pulmonary vascular resistance and failure to increase pulmonary blood flow may not be able to hold an increase in cardiac output. A compromised cardiovascular system may not be able to tolerate massive fluctuations in blood volume, pre- and postpartum. The decrease in peripheral vascular resistance during pregnancy can amplify right-to-left shunting, and aggravate maternal hypoxemia and cyanosis.

Pregnancy is a cause of significant mortality in women with Eisenmenger syndrome. A systematic review of published studies from 1978 to 1996 examined maternal mortality rates in women with Eisenmenger syndrome and demonstrated mortality rates of 56%. The degree of maternal hypoxemia is a key predictor of fetal outcome. Pre-pregnant arterial oxygen saturation of 85% or less is tied to live birth rate as low as 12%, while saturation of 90% or more is associated with a 92% live birth rate. This can be explained by an increase in spontaneous abortions, risk of premature delivery of around 30-50% and low birth weights.

Maternal mortality, in association with Eisenmenger syndrome, has been reported to be as high as 30-50%. Gleicher et al reported a 34% mortality associated with vaginal delivery and a 75% mortality associated with cesarean section.

Mortality is high if pregnancy is continued. Therefore, abortion is the treatment of choice for women ho have Eisenmenger syndrome. For patients who wish to continue gestation, hospitalization in the second trimester is highly recommended.

Intrauterine growth restriction is observed in 30% of pregnancies on account of maternal hypoxemia. Furthermore, premature labor is encountered in around 50-60% of cases and the high perinatal mortality rate of around 28% is often attributed to prematurity. In a study conducted among women with Eisenmenger syndrome, 47% delivered at term, 33% delivered between 32 and 36 weeks, and 20% delivered prior to 31 weeks of gestation.

Continuous administration of oxygen, anticoagulation and pulmonary vasodilator is disputed. While there is a scarcity of controlled trials, a Brazilian series of 13 pregnancies revealed that there was improved maternal mortality (23%) with oxygen therapy, heparin before delivery and warfarin after 48 hours. About 60% of infants were live births, mostly premature. There seems to be no evidence to support the choice of vaginal or cesarean delivery based on cardiac reasons. However, vaginal delivery is tied to a lower average blood loss at the cost of escalated maternal effort.

Mortality among patients with Eisenmenger syndrome who concieve remains high. All patients should receive appropriate advice regarding contraception. If a patient becomes pregnant, clinicians must offer therapeutic termination of pregnancy. However, if pregnancy is continued against medical advice, treatment strategies mentioned above may help, with prolonged hospital care, pre- and postpartum.

CONCLUSION

Although pregnancy should be discouraged in women with Eisenmenger syndrome, it can be successful with careful monitoring and a well-coordinated multi-specialist care, as elucidated in this case.

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LETTER TO EDITOR

Atraumatic Cervical Clamps in Obstetric Practice

BHARTI KALRA*, KAMLESH DHINGRA†

The cervix is an important part of female anatomy,[1] which has to be manipulated during gynecological and obstetric procedures. Whether the procedure is surgical or conservative, whether the target area is noncervical or cervical, some amount of cervical stabilization is required in order to visualize and access the female genital tract.

While a speculum helps in visualization of the lower genital tract, a cervical clamp is used to hold the cervix and facilitate assessment and intervention in the upper genital tract. Various clamps are available, and each have their advantages and limitations.[2-4] The tenaculum and vulsellum are single and multi-toothed forceps, while the Allis clamp is an atraumatic clamp, which causes less bleeding. The Shirodkar clamp, ring forceps and gynecological forceps (green Armytage clamps) (Fig. 1) are some user-friendly innovations that assist in easy and efficient performance of procedures such as intrauterine device insertion/removal, dilatation and curettage and hysterosalpingography.

It becomes challenging, however, to stabilize the cervix with traditional clamps, while treating local pathologies like cervical tears that may occur during delivery. The large surface area (10 mm width of sponge holder tip, 13 mm width of green Armytage clamps) of these clamps hinders dexterous use of needles for stitching of tears. The traumatic nature of some of them (such as tenaculum and toothed forceps) can cause bleeding. In both these situations, effective hemostasis is prevented and effective treatment delayed.

A novel atraumatic cervical clamp, with lesser surface area (6 mm width 30 mm length) can be used to handle the cervix in obstetric procedures (Fig. 2). This stainless steel clamp provides stability to the cervix, without obscuring visual and dexterous ability to use other instruments, and facilitates addressal of cervical tears. The clamp is specifically useful in obstetric settings as the soft cervix is more friable and prone to trauma. It allows early cessation of postpartum bleeding from cervical tears, and prevents avoidable blood loss.

Figure 1. Green Armytage, ring forceps, atraumatic cervical clamp (left to right).

Figure 2. Tip of green Armytage clamp (left) atraumatic cervical clamp (right).

This Indian innovation is easily available, economical and effective in a wide variety of clinical situations. It can be used in both normal and assisted vaginal deliveries, and finds utility in prevention as well as treatment of cervical bleed. We suggest that this clamp be tried out in research institutes to generate evidence regarding its efficacy, safety and tolerability.

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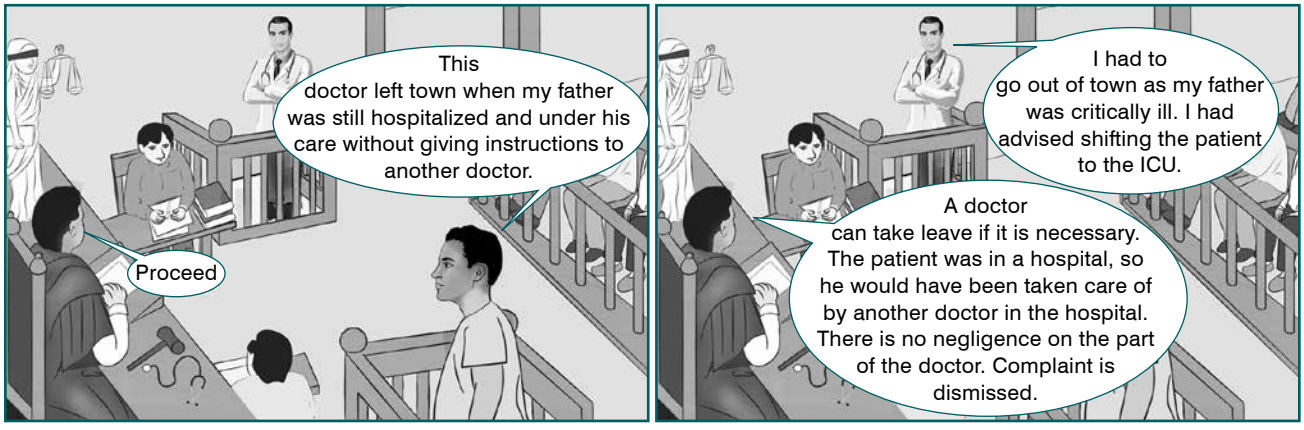
A Doctor, Like Any Other Professional, can Take Leave if Felt Necessary by Him



Lesson: In a judgement, the NCDRC said, "A doctor, like any other professional can take leave if felt necessary by him on account of his personal reasons or otherwise. If that happens it is for the hospital in which the patient is admitted to make alternative arrangement for the treatment of the patient in the hospital… the patient was admitted in a hospital and not in the clinic of Dr…, who could not have been expected to remain with the patient or in the hospital 24 hours of the day. Like other normal human being he also needs to take rest and his meals and then get ready for the duty to be performed on the next day." *Shri Manishbhai Kantilal Joshi vs Sheth P. T. Surat General Hospital, Surat, National Consumer Disputes Redressal Commission, New Delhi, Consumer Case No. 366 of 2014, dated: 09 Feb 2016.*

COURSE OF EVENTS

- 19.11.2012: The patient, an 86-year-old man was hospitalized in Hospital X (*hereby referred to as Opposite Party No. 1*). He was admitted another doctor, but was later put under the treatment of Dr 'A' (*hereby referred to as Opposite Party No. 2)*, a chest physician.
- 20.11.2012: The patient was under the care of Dr 'B' (*hereby referred to as Opposite Party No. 3)*, after Dr 'A' had retired for the day.
- 21.11.2012: The patient died at about 2.30 am while on ventilator in the ICU.

COMPLAINANT ALLEGATIONS

The son of the patient (*hereby referred to as complainant*) filed a complaint of negligence in the treatment of his father before the National Consumer Disputes Redressal Commission (NCDRC) seeking compensation of Rs. 2 crores along with cost of litigation quantified at Rs. 50,000/-.

- Dr 'A' had left for outstation when the deceased was still admitted in the hospital and was under his treatment.
- Dr 'A' left without giving the instructions to Dr 'B'.
- Dr 'B' was not a qualified specialist in the relevant field.

SOME SALIENT COURT OBSERVATIONS

- Dr 'A' (OP 2) stated that the patient had chronic end-stage respiratory disease, severe chronic obstructive pulmonary disease, fibrotic lung lesion and bronchiectasis. Though the patient had been admitted under another doctor, he had also been treating the patient since last few months as an outpatient.
- The patient had been on nebuliser and home oxygen therapy for 6 months prior to his death. His advanced age ruled him out as a good lung transplant candidate and so steroid treatment was started.
- Dr 'A' (OP 2) planned to leave on 20.11.2012 as his father had taken critically ill in the evening on the same day. He therefore advised that the patient be moved from the ward to the intensive care unit (ICU), where the patient was first put on noninvasive ventilation, and then shifted to invasive ventilatory support on account of the worsening condition after taking the consent from the complainant. The patient's condition was informed to the family members before taking the consent.

- Dr 'A' (OP 2) last saw the patient on 20.11.2012 around 8 pm. "*It is stated in the reply that the patient was duly taken care of treating his treatment in the hospital and there was absolutely no negligence in the said treatment.*" In his reply, Dr 'A' (OP 2) said that the patient succumbed to long existing chronic end-stage respiratory disease.
- In their statement, both Dr 'B' (OP 3) and Hospital X (OP 1) have concurred with Dr 'A' (OP 2) and stated that "*the patient was admitted with past history of Bilateral Centrilobulor Emphysema in the form of Hyperinflated lung with flattening of lobes, Minimal subpleural opacity in the right upper lobe suggest fibrotic/old granulomatous lesion, Atherosclerotic aortic changes and degenerative spinal changes along with Rounding of Trachea and filling defect in upper trachea.*" And that the patient had been treated as per the standard protocol by Dr 'A' (OP 2) "*but the patient succumbed to the chronic disease despite adequate treatment given to him.*" They also said that Dr 'B' (OP 3) is "*a qualified doctor, who was employed on regular basis with the OP 1.*"

COURT OPINION

- The Commission found no merit in the allegation that Dr 'A' (OP 2) had left "*without giving proper instructions*" to Dr 'B' (OP 3) about the treatment of the patient.
- There was no evidence to support the complainant's allegation that Dr 'A' (OP 2) had left town on 20.11.12. The medical records also corroborate the statement by Dr 'A' (OP 2) that he had last seen the patient at 8 pm on 20.11.12. "*Be that as it may, even if we proceed on the assumption that Dr 'A' had taken leave and left for outstation on 20.11.2012 that by itself does not make out any negligence on his part in the treatment of the patient.*"

  "*A doctor, like any other professional can take leave if felt necessary by him on account of his personal reasons or otherwise. If that happens it is for the hospital in which the patient is admitted to make alternative arrangement for the treatment of the patient in the hospital. We have to keep in mind that the patient was admitted in a hospital and not in the clinic of Dr ... Therefore, in the absence of Dr … the patient was to be treated by some other doctor available in the hospital or called by the hospital* from outside. No case of negligence *on the part of the Dr … is therefore made out even if we assume that he had left for outstation on 20.11.2012.*"
- In response to the complainant's allegation that Dr 'A' had left without giving instructions to Dr 'B', the Commission observed that the patient records maintained by the hospital include all relevant information of the patient such as clinical history, treatment administered. Any "*suitably qualified doctor attending the patient*" could manage the patient in the absence of the previous doctor. Hence, "*no such briefing would be necessary*".
- "*So long as the doctor treating the patient in the absence of the previous doctor is a competent doctor he should have no difficulty in treating the patient on the basis of the record prepared in the hospital.*" And Dr 'B' (OP 3) has not stated that "*he was handicapped in any manner in the treatment of the patient on account of having not been adequately briefed*" by Dr 'A' (OP 2). The Commission did not accept the complainant's contention that the leave taken by Dr 'A' (OP 2) was responsible for his father's death.
- Dr 'B' (OP 3) could manage the patient as he had an MD degree and "*it is not as if only a super specialist in chest related disease can treat such a patient.*" The Commission observed: "*A doctor, who has done Post Graduation in Medicine, in our opinion, is fully competent to treat the patient. In fact, in almost all the hospitals, Senior Doctors normally retire for the day in the evening/night and it is only Junior Doctor such as Junior Residents and Senior Residents who remain on duty. The consultant is called if necessary, depending upon the condition of the patient.*" Hence, the commission disregarded the allegation that Dr 'B' (OP 3) was not qualified enough to treat the father of the complainant in the absence of Dr 'A' (OP 2).
- Dr 'A' (OP 2) had last seen the patient on 20.11.2012 at about 8 pm. The patient died at about 2.30 am on 21.11.2012 i.e., "*within a span of 6 ½ hours*" after he had left the hospital.

FINAL JUDGEMENT

The Commission ruled in favour of Dr 'A' (OP 2) and said that "*he could not have been expected to remain with the patient or in the hospital 24 hours of the day. Like other normal human being he also needs to take rest and his meals and then get ready for the duty to be performed on the next day.*" As there was no evidence of any negligence on the part of Dr 'A' (OP 2) in leaving the hospital and the patient being treated by Dr 'B' (OP 3) in his absence, the Commission dismissed the allegations of the complainant with no order as to costs.

REFERENCE

1. Shri Manishbhai Kantilal Joshi vs Sheth P. T. Surat General Hospital, Surat, National Consumer Disputes Redressal Commission, New Delhi, Consumer Case No. 366 of 2014, Hon'ble Mr. Justice V.K. Jain, Presiding Member and Hon'ble Dr. B.C. Gupta, Member, Dated: 09 Feb 2016.

HCFI Dr KK Aggarwal Research Fund

CORONAVIRUS UPDATES

Daily New Cases Increasing But Deaths Decreasing, Says WHO

As per the latest WHO Epidemiological Update #92, global deaths saw a decline of 21% in the last week, but the daily new cases continued to increase in many parts of the world. The Eastern Mediterranean Region saw a rise of 63% in new weekly infections, while in the Americas new weekly cases increased by 26%. Cases are declining in Southeast Asia and Europe. The weekly cases also increased in Africa and the Western Pacific region. Africa registered a 48% increase in new weekly deaths… (*Source: WHO, May 18, 2022*)

Children Aged 5 to 11 Now Eligible for Pfizer Booster Dose

Children aged 5 to 11 years are now eligible for a booster dose of the Pfizer vaccine after a gap of 5 months from the second dose of the Pfizer vaccine. Earlier this year in January, a single booster dose of vaccine was authorized by the Food and Drug Administration (FDA) for use in children aged 12 to 15 years of age following the primary vaccination with the Pfizer vaccine … (*Source: US FDA, May 17, 2022*).

Fluvoxamine Fails to Pass Muster as COVID-19 Treatment

Fluvoxamine, a selective serotonin reuptake inhibitor used as an antidepressant has failed to get the FDA's nod as outpatient treatment for patients with coronavirus disease 2019 (COVID-19) aged ≥24 years to prevent progression of the disease to severe stage, necessitating hospital admission. The FDA said that the data regarding the effectiveness of the drug was inadequate… (*Source: Medscape, May 18, 2022*).

COVID Test for Domestic Travel in the US

The Centers for Disease Control and Prevention (CDC) advises all domestic travelers in the United States, including those who are fully vaccinated and boosted, to get tested as close to the day of travel. Travelers who have been in crowded places, without masks, should get themselves tested at the end of the trip. The CDC further recommends all domestic travelers to be aware of the rules and regulations of the destination they are traveling to… (*Source: CDC, May 16, 2022*).

Vaccination Reduces Probability of Long COVID

A *BMJ* study involving more than 28,000 participants from the UK has found that COVID-19 vaccination reduced the chances of long COVID. The first vaccine dose reduced the probability of long COVID by 12.8%, while the second vaccine dose reduced the odds of post-COVID syndrome by nearly 9%. The risk reduced by 0.8% every week after the second dose… (*Source: BMJ, May 18, 2022*).

Formation of Viral Aggregates may have Caused High Transmissibility of Delta Variant

New research published in Viruses has shed some light on why infection with the Delta variant was highly transmissible and had high viral load. Uniquely, the pseudo-typed Delta particles formed large aggregates of viral particles enabling further spread of the virus. Also, this leads to larger number of viral particles coming in contact with the host cell. No such aggregation was observed with other severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) variants… (*Source: NIH, May 11, 2022*)

COVID-19 Weekly Cases Continue to Fall Globally

New weekly cases continue to decrease worldwide following a peak in January this year. According to WHO's latest weekly epidemiological update on COVID-19, more than 3.7 million cases were recorded in the week from 16th May to 22nd May, which is a 3% decline from the preceding week. Weekly deaths also showed a decline of 11% from the previous week. Among the six WHO regions, new weekly cases increased by 13% in the Region of the Americas; the Western Pacific Region saw a rise of 6%, whereas cases decreased in all the other four regions… (*Source: WHO, May 25, 2022*)

CDC Still Advises Paxlovid Despite Reports of COVID-19 Rebound

Even as it alerted physicians about cases of "COVID-19 rebound" following treatment with Paxlovid, the CDC still advises Paxlovid (nirmatrelvir/ritonavir) for treatment of mild-to-moderate COVID-19 in patients at high risk of developing severe disease. COVID-19

rebound reportedly occurs 2 to 8 days after the patient has recovered. It is marked by either recurrence of symptoms or a positive test after a negative test. The CDC says that this "return of symptoms may be part of the natural history of SARS-CoV-2". Such persons should isolate themselves again for minimum of 5 days and wear a mask for 10 days after onset of rebound illness… (*Source: CDC, May 24, 2022*)

BA.2.12.1 is the New Dominant COVID-19 Variant in the US

As per CDC data, the dominant COVID-19 strain in the United States now is BA.2.12.1, a sublineage of the BA.2 Omicron "stealth" subvariant. In the week from 15th May to 21st May, nearly 58% of total cases were due to BA.2.12.1. The BA.2 contributed 39% cases, while the share of original B.1.1.529 Omicron variant was less than 3%. The BA.2.12.1 variant is highly infectious, more than the BA.2 variant... (*Source: CDC, May 24, 2022*)

Mammography should not be Delayed Post-COVID-19 Vaccine

New research says that screening mammography should not be delayed following vaccination with COVID-19 mRNA vaccine. As reported in the *American Journal of Roentgenology*, the lymph nodes did not resolve till 127 days after the first dose of the vaccine and 97 days after the first ultrasound. In some women, axillary lymph node enlargement has been detected post-vaccine and may be misdiagnosed as breast cancer. Mammography was earlier recommended to be scheduled before the first dose of the vaccine or at least 4 to 6 weeks after the second dose… (*Source: American Journal of Roentgenology, May 18, 2022*)

Abnormal Gas Transfer may Explain Post-COVID Shortness of Breath

A hyperpolarized xenon 129 MRI (Hp-XeMRI) could detect abnormalities in gas transfer in patients who complained of shortness of breath even months after recovering from COVID-19 but had normal CT scans and lung function tests. The Hp-XeMRI revealed lower DLCO in post-COVID patients, both hospitalized and nonhospitalized, suggestive of a decline in lung function but no structural abnormality… (*Source: Medscape, May 27, 2022*)

Air Pollution Increases Risk of Severe COVID-19 Outcomes

Long-term exposure to air pollutants, in particular ozone, increases the risk of severe disease with ensuing adverse outcomes in patients with COVID-19. For every 5.14 ppb rise in IQR, exposure to ozone increased the risk of hospitalization, ICU admission and mortality with odds ratios of 1.15, 1.30 and 1.18, respectively. The study of more than 1,50,000 patients examined the association of fine particulate matter (PM2.5), nitrogen dioxide ($NO_{2)}$ and ground-level ozone (O_3) with COVID-related outcomes… (*Source: Canadian Medical Association Journal, May 24, 2022*)

Omicron Continues to be the Dominant Strain Globally

The dominant SARS-CoV-2 strain is still Omicron, says the WHO in its latest COVID-19 Weekly Epidemiological Update. The BA.2 is the dominant Omicron sublineage, even though there has been a decreased from 78% to 75% in the preceding 30 days. The prevalence of BA.1 sublineage has also reduced from 7% to 4%. However, there has been a rise in BA.2.12.1, BA.4 and BA.5 sublineages in the same period. BA.2.12.1 has increased from 11% to 16%; BA.4 from 2% to 3%, while BA.5 has increased from 1% to 2%... (*Source: WHO, June 1, 2022*)

Burnout Highly Prevalent in Medical Students

In a survey of 613 medical students conducted in 2021, more than half (54%) of the students were found to have symptoms of burnout due to the pandemic. Eighty percent reported emotional exhaustion; 57% had high cynicism scores, while 36% scored low on academic effectiveness. All these symptoms were more common female students versus male students. Female students were nearly twice as likely to develop burnout as male students with odds ratio of 2.12. The risk of burnout was higher for factors like smoking and death in the family due to COVID (*Source: Medscape, June 1, 2022*).

Vaccination During Pregnancy Reduces Risk of COVID-19 in Newborns

A study from Norway has shown a 33% lower odds of newborns testing positive for COVID-19 if their mothers had been vaccinated against COVID-19 during pregnancy at 4 months of age compared to children born to mothers who had not been vaccinated with hazard ratio of 0.67 during the Omicron wave. This difference was even more noticeable during the Delta wave where the risk of newborns testing positive for the virus reduced by 71% if their mothers had taken the COVID-19 vaccine... (*Source: Medpage Today, June 1, 2022*)

With inputs from Dr Monica Vasudev

72nd Annual Cardiology Conference

CARDIOVASCULAR SAFETY OF SULFONYLUREAS: IT'S A LONG JOURNEY TILL CAROLINA

Dr Manish Bansal, Gurugram

- Although still more evidence is needed, it appears that modern sulfonylureas (SUs) may not be associated with cardiovascular (CV) harm.
- When affordability is not an issue, sodium-glucose co-transporter-2 (SGLT2) inhibitors and glucagon-like peptide-1 receptor agonists (GLP-1RA) are preferred in patients at high CV/heart failure risk.
- However, if the cost is an issue, modern SUs are a reasonable alternative.
- CV safety of SUs: It's a long journey till CAROLINA.

RIVAROXABAN: A NEW TREATMENT PARADIGM IN THE SETTING OF VASCULAR PROTECTION?

Dr KP Pramod Kumar, Chennai

The pathophysiology of atherosclerosis involves a diseased endothelium, lipid accumulation and low-grade inflammation. Later stages of coronary artery disease (CAD) and peripheral artery disease (PAD) are characterized by atherothrombosis induced by plaque rupture, caused by fibrin formation and platelet activation, resulting in vessel occlusion, followed by organ damage, such as myocardial infarction (MI), stroke or limb ischemia. The high disease burden associated with CAD and PAD necessitates the need for continuous vascular protection beyond the treatments available at present, including antiplatelet agents.

The factor Xa plays a key role in the etiopathogenesis of atherothrombosis. Experimental data point to the anti-inflammatory and antioxidative potential of rivaroxaban, and also suggest that the drug may improve endothelial dysfunction. The COMPASS trial revealed that in patients with stable atherosclerotic vascular disease, adding rivaroxaban 2.5 mg twice daily (vascular dose) to aspirin yielded a higher cardiovascular protection compared to aspirin alone.

The ROCKET-AF trial noted that in comparison with warfarin, rivaroxaban 20 mg once daily (15 mg if moderate renal dysfunction) (anticoagulant dose) was at least as effective as warfarin for preventing stroke or systemic embolism among patients with nonvalvular atrial fibrillation, with a trend toward a reduction in the risk of cardiovascular outcomes. Rivaroxaban, therefore, might have a vascular protective effect beyond its stroke/systemic embolism preventive activity.

Suggested Reading: [1]Barrios V, Almendro-Delia M, Facila L, et al. Rivaroxaban: Searching the integral vascular protection. Expert Rev Clin Pharmacol. 2018;11(7):719-28. [2]Bauersachs R, Zannad F. Rivaroxaban: A new treatment paradigm in the setting of vascular protection? Thromb Haemost. 2018;118(S 01):S12-S22.

CLINICAL EVALUATION IS ENOUGH TO ASSESS DECONGESTION AND DECIDE ON DISCHARGE IN HEART FAILURE

Dr Ajay Bahl, Chandigarh

- Clinical assessment based on symptoms like edema, breathlessness and orthopnea, weight records, jugular venous pressure, third heart sound on auscultation, and renal function tests should be used to guide therapy and decision on discharging patients with acute decompensated heart failure.
- Natriuretic peptides are useful in the diagnosis and prognostication of acute heart failure.
- However, guided therapy based on natriuretic peptide levels has not been shown to reduce post-discharge clinical events.

ASYMPTOMATIC TO SYMPTOMATIC HEART FAILURE – PREDICTORS OF PROGRESSION

Dr Harikrishnan S, Trivandrum

Progression from Stage A/B of heart failure to Stage C/D should be prevented or delayed to improve the outcomes. Close periodic monitoring is needed. Clinical markers are not very sensitive and specific. We need to use biomarkers like B-type natriuretic peptide (BNP)/N-terminal (NT)-proBNP.

Echocardiographic parameter ejection fraction may not be that sensitive, so parameters like GLS (global longitudinal strain) is found to be very useful. Control of risk factors is the key. BP should be controlled to the level of 130/70-80 mmHg, considering the reverse J curve phenomenon.

Diabetes should be controlled to glycated hemoglobin (HbA1c) levels of 7-8%. Early initiation of

renin-angiotensin-aldosterone system (RAAS) blockers, β-blockers and aldosterone blockers may help. SGLT2 inhibitors may be useful; the data is emerging.

WHO BENEFITS FROM TAKING A STATIN, AND WHEN?

Dr BKS Sastry, Hyderabad

The beneficial effects of statins are attributed to their capacity to decrease cholesterol biosynthesis, particularly in the liver, where they are selectively distributed, and to the modulation of lipid metabolism, derived from their inhibition of HMG-CoA reductase. Statins are known to have antiatherosclerotic effects that are positively correlated with the percent reduction in low-density lipoprotein (LDL) cholesterol. Statins also exert antiatherosclerotic effects independently of their hypolipidemic action, which are referred to as their pleiotropic effects.

Guidelines from the US Preventive Services Task Force, American College of Cardiology and American Heart Association suggest four main groups of people who may obtain benefits from the use of statins:

- **Individuals who don't have heart or blood vessel disease, but have one or more cardiovascular disease (CVD) risk factors and a predicted 10-year risk of a heart attack >10%.** People with diabetes, high cholesterol or high blood pressure, or who smoke and whose 10-year risk of a heart attack is >10% constitute this group.
- **People who have CVD related to hardening of the arteries.** This group includes individuals who have had heart attacks, strokes due to blockages in a blood vessel, ministrokes (transient ischemic attacks), PAD or have undergone surgery to open or replace coronary arteries.
- **Individuals with very high LDL cholesterol.** This group includes adults with LDL cholesterol levels of 190 mg/dL (4.92 mmol/L) or higher.
- **People with diabetes.** This group includes adults aged 40-75 years who have diabetes and LDL cholesterol level of 70-189 mg/dL (1.8 and 4.9 mmol/L), particularly if there is evidence of blood vessel disease or other risk factors for heart disease, such as high blood pressure or smoking.

The US Preventive Services Task Force recommends low- to moderate-dose statins in adults 40-75 years of age, having one or more risk factors for heart and blood vessel disease and at least a 1 in 10 likelihood of having a CVD event in the ensuing 10 years.

Suggested Reading: [1]Stancu C, Sima A. Statins: mechanism of action and effects. J Cell Mol Med. 2001;5(4):378-87. [2]Available from: https://www.mayoclinic.org/diseases-conditions/high-blood-cholesterol/in-depth/statins/art-20045772.

DAPA-HF, EMPEROR-REDUCED AND DAPA-CKD: PUTTING IT ALL TOGETHER

Dr John JV McMurray, Glasgow

SGLT2 inhibitors are much more than just effective glucose-lowering therapy for T2D *(think angiotensin-converting enzyme [ACE] inhibitor or statin!).* They reduce the risk of developing heart failure in patients with T2D and chronic kidney disease (CKD) patients (even CKD patients without T2D). They reduce the risk of hospitalization and death in patients with heart failure and reduced ejection fraction, with and without diabetes – and improve symptoms/health-related quality of life. They reduce the rate of decline in estimated glomerular filtration rate (eGFR) in patients with heart failure with reduced ejection fraction (HFrEF) and the risk of end-stage kidney disease (ESKD) in patients with CKD, with and without diabetes. SGLT2 inhibitors protect the heart and kidneys and have become the new "standard of care" in HFrEF and CKD.

CORONARY ARTERY CALCIUM – WHAT LIES BENEATH?

Dr Mona Bhatia, New Delhi

Coronary artery calcium (CAC) is ready for prime time – A strong predictor of CV risk; Cost-effective, safe, widely available. Fully endorsed in the guidelines. Integrates well into our current healthcare landscape to focus on prevention and shared decision-making. CAC is recommended when the individuals' atherosclerotic cardiovascular disease (ASCVD) 10-year risk is uncertain (5-7.5% odds ratio [OR] 7.5 -20%). CAC is a companion diagnostic, helps accurately identify responders, reduce the number needed to treat, with efficient use of scarce resources. Particularly useful in patients who are statin reluctant or statin intolerant. Aids decision for nonstatin/aspirin therapy.

KETO DIET – IS IT SAFE FOR THE HEART?

Dr BRJ Kannan, Madurai

Dietary fat has been projected as a villain in the past 60 years or so. This has led to an increase in the carbohydrate intake to the tune of more than 75% of daily calories. Any diet with a carb content higher than 55-60% of daily calories would increase mortality. Keto diet, a very high-fat diet with <30% calories from carbohydrates, is unsafe for the heart. Any diet with

a carbohydrate content of lesser than 40% of daily calories also would increase mortality. For the best CV outcome, we need to balance the diet by increasing the current fat intake to at least 25% of daily calories with a corresponding reduction of carbohydrates to 50-55%.

CARDIOVASCULAR IMPACT OF COVID-19: AN AMERICAN PERSPECTIVE

Dr Mark Huffman, Chicago

- COVID-19 in the US: The problems – Lack of coordination across and within states; Slow reporting of facility-based data to identify and respond to health disparities; Catastrophic health spending; Political polarization, misinformation, widespread distrust.
- The US has the largest burden of diagnosed COVID-19, accounting for 22% of global cases, and will likely have the largest burden of COVID-19 complications, including HF.
- The pandemic exposed the US's fragile and inequitable health system arrangements and under-investments in public health.
- The heart and soul of the US have been battered in 2020; a renewed spirit of cooperation, collectivism and humility are needed, as well as safe, effective and equitably-distributed vaccines.

MANAGING A CVD PATIENT – FROM PRIMARY TO SECONDARY PREVENTION

Dr Peter Lin, Canada

- JUPITER Trial – It was conducted in low-risk patients; patients with (LDL) cholesterol levels of <130 mg/dL and high-sensitivity C-reactive protein levels of 2.0 mg/L or higher were included.
- The trial was stopped after a median follow-up of 1.9 years. There was a 44% reduction in primary endpoint, 54% reduction in MI, 48% reduction in stroke, 46% reduction in revascularization and 20% reduction in death with rosuvastatin therapy.
- HOPE 3 study – It included intermediate risk patients. First co-primary endpoint: Composite of CV death/MI/stroke for rosuvastatin vs. placebo: 3.7% vs. 4.8%, hazard ratio (HR) 0.76, number needed to treat (NNT) = 91. There was no difference in incidence of diabetes in the two groups in the HOPE 3 trial (New-onset diabetes mellitus: 3.9% vs. 3.8%, p = 0.82).
- REDUCE-IT randomized patients to receive icosapent ethyl twice daily or placebo. A primary endpoint event occurred in 17.2% of the patients in the icosapent ethyl group, as compared with 22.0% of the patients in the placebo group, an absolute between-group difference of 4.8% points; the NNT to avoid one primary endpoint event was 21 (95% CI, 15-33) over a median follow-up of 4.9 years.
- Statins should form a good baseline therapy. Drugs like ezetimibe can be added later.
- Studies from the Netherlands, UK and Canada suggest that rosuvastatin is associated with lower incidence of fatal and nonfatal CVD, compared to other statins and there was no evidence of greater risk of myopathy, rhabdomyolysis, acute renal failure and acute liver injury among patients treated with rosuvastatin compared to other statins.

A GLIMPSE INTO THE 70 YEARS LEGACY OF FRAMINGHAM HEART STUDY

Dr Rakesh Yadav, New Delhi

Framingham Heart Study (FHS) has been one of the most important studies for CV health worldwide. It has firmly established various risk factors (hypertension, dyslipidemia, smoking and diabetes) for CVD, heart failure, stroke etc., and paved the path for various randomized, controlled clinical trials that led to the subsequent development and implementation of effective treatments for these conditions. With the USA's changing demographics, changing epidemiology of CV, and the formation of so-called mega-cohorts, the role of FHS has changed over the past 70 years and has maintained its importance in this regard. It remains a lodestar for epidemiological cohort studies for CVD – To understand the trends in risk factors and disease and understand what can be done to lower the risk and burden of CVD. It has also been and will continue to be an important institution to train CVD epidemiologists, biostatisticians and bioinformaticians (FHS has trained >90 fellows over the past three decades). An increasing amount of data from various cohorts is currently being made available via major data repositories, making access to data by investigators not formally affiliated with the FHS much easier. FHS has maintained its legacy even after 70 years of completion.

CARDIOVASCULAR IMPACT OF COVID-19: EUROPEAN EXPERIENCE

Dr Barbara Cassedei, England

- The European response to COVID-19 has been slow and inhomogeneous. This has cost many lives.

- Evidence that severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causes acute myocarditis is largely absent.
- Interrogation of continuous patient registries and large data sources (e.g., UK Biobank, openSafely, SwedeHeart, NICOR) and digitized health systems have accurately highlighted the disparities in risk and outcomes of COVID-19 and provided the infrastructure for undertaking pragmatic randomized controlled trials.
- Once corrected for age, diabetes, obesity and social deprivation, the excess risk of coronavirus disease 2019 (COVID-19) death conferred by CVD is relatively small. The impact of the pandemic on non-COVID-19 mortality has been significant. This may have contributed to the excess non-COVID-19-related mortality observed during the first wave of the pandemic

LDL-C MANAGEMENT: TARGET-BASED OR DOSE-BASED?

Dr Sadanand Shetty, Mumbai

I will continue with high-dose statin irrespective of low LDL cholesterol.

Why is longer therapy with high-intensity statin required?

- Longer the better: Takes time for complete clinical benefit from the time of LDL-lowering.
- Lowest LDL levels are best: No safety concerns with low LDL levels.
- The incremental benefit with absolute LDL reduction: Reduce residual risk.

I WILL NOT RECOMMEND ABPM ROUTINELY

Prof (Dr) Vitull K Gupta, Bathinda

- Hypertension is one of the most prevalent CVD risk factors. Accurately measuring BP is essential for proper diagnosis and management.
- Recent guidelines recommend that the diagnosis of hypertension (HTN) should be based on repeated office BP measurements or ambulatory BP monitoring (ABPM) if economically feasible.
- Evidence substantiates the value of ABPM and home BP monitoring (HBPM) but does not recommend universal use of ABPM for diagnosis and management of HTN.

So, I will not recommend ABPM to all the patients routinely because of the paucity of available resources, both human and financial, and guidelines do not suggest universal use of ABPM.

ACUTE CORONARY SYNDROME

Prof (Dr) PS Banerjee, Kolkata

- Acute coronary syndrome (ACS) is a potentially life-threatening condition that affects millions of individuals each year.
- Diagnosis is based on serial ECG and cardiac marker levels, particularly using new, highly sensitive troponin T estimation.
- Initial ACS management should include risk stratification, appropriate pharmacologic management including dual antiplatelet therapy, anticoagulation and appropriate adjuvant therapies and a decision to pursue early invasive or conventional treatment strategy.
- Long-term management following an ACS event should follow evidence-based recommendations and should be individualized to each patient.

EGGS AND CARDIOVASCULAR HEALTH

Dr S Sivasankaran, Thiruvananthapuram

Egg yolk rich in cholesterol should be avoided in the diet to ensure vascular health. Cholesterol is unique to the animal kingdom and is insoluble in water. It is a crucial component of the cell membrane and steroid hormones. All cells synthesize adequate cholesterol. Dietary cholesterol reaches the cells via transport proteins and receptors. Downregulation of receptors allows cholesterol in the transport protein LDL to remain in circulation for longer, which can turn out to be vasculotoxic. Keeping LDL (a protein that transports cholesterol) below 70 mg/dL is ideal to preserve vascular health. Therefore, avoiding egg yolk in the diet is a key dietary prevention strategy for Indians at high risk for vascular disorders and diabetes.

■■■■

News and Views

"Mounjaro" Approved by US FDA Approves Type 2 Diabetes Treatment

Recently, the US Food and Drug Administration (FDA) approved Eli Lilly's "Mounjaro" an injected drug tirzepatide to treat adults with type 2 diabetes.

According to the FDA, more than 30 million Americans have type 2 diabetes which was the most prevalent type of chronic and progressive disease resulting in excessive blood sugar levels due to improper production of use of insulin by the body.

"Mounjaro" in combination with diet and exercise, pull down blood sugar levels and was more effective than other diabetic medications tested in clinical trials. The medicine stimulated blood sugar-controlling hormone receptors and had to be injected once weekly, with the dose adjusted as tolerated to meet blood sugar targets.

Lilly announced last month that a late-stage trial of tirzepatide revealed that it helped obese people lose more than 20% of their weight. Ozempic drug by Novo Nordisk's has also been approved previously for obesity treatment. (*Source: Reuters, May 14, 2022*)

CCMB Develops India's First mRNA Vaccine Technology for COVID-19

The mRNA vaccination technique developed by the Centre for Cellular and Molecular Biology (CCMB) Hyderabad, is completely indigenous and was created without the help of any outside scientists, making it India's first in house mRNA vaccine technology to be developed against coronavirus disease 2019 (COVID-19).

In a mouse model, the technology was 90% effective against COVID-19, and once the pandemic is over, it might be employed against other infectious diseases like malaria, dengue fever and tuberculosis. A unique approach has been used by the CCMB researchers in comparison to the Pune-based pharmaceutical firm's mRNA vaccine, which is currently under clinical trials.

The new mRNA vaccine candidate is presently in pre-medical testing, with its efficacy being examined against the novel coronavirus infection. Dr Vinay Nandicoori, the Director of the CCMB, revealed that researchers from the CCMB's Atal Incubation Centre completed the vaccine development within a year of the project's start. (*Source: ETHealthworld, May 14, 2022*)

Daily Intake of Aspirin is not Required by All Elderly to Prevent Heart Attack, Stroke

The US Preventive Services Task Force (USPSTF) stated that regular aspirin intake for preventing primary cardiovascular disease (CVD) was not necessary for people aged 60 and above. It also stated that anyone aged between 40 and 59 who has a 10-year CVD risk of 10% or more should consult their doctor before starting aspirin. Experts in India believe that the benefits of the medicine aspirin much exceed the hazards in several circumstances, and intake of daily low-dose aspirin helped in the prevention of heart attacks and strokes by making the blood less sticky.

Dr Ashok Seth, Chairman of the Fortis Escorts Heart Institute (FEHI), stated that Indians were at a higher risk of heart disease and stroke than the western population. Hence, adopting USPSTF guidelines created for the US population may not benefit Indians, and the statement issued in the *Journal of the American Medical Association* should be reconsidered (JAMA). According to him, people with a previous history of heart attack or stroke, those who have undergone angioplasty or bypass surgery, and those who are regularly taking daily aspirin should keep taking it.

Dr Mohit Gupta, Professor of Cardiology at GB Pant Hospital, also remarked that western guidelines should not be blindly followed. However, the unnecessary use of aspirin to prevent heart attacks and strokes in people over 60 with no other risk factors should be avoided. In younger patients, it should be tailored to their needs.

Dr KK Talwar, the Chairman of the PSRI Heart Institute, stated that low-dose aspirin is only recommended for patients at very high risk and not for routine primary prevention.

According to Dr Ambuj Roy, Professor of Cardiology at AIIMS, low-dose aspirin may be required in a small number of people with elevated calcium on computed tomography (CT), and low-dose aspirin has a very limited impact in preventing primary CVD. (*Source: ETHealthworld, May 14, 2022*)

Study Reveals Maternal Obesity Impedes Heart Health and Function in the Fetus

The Journal of Physiology published a study which stated that maternal obesity affects the heart health and function of the fetus.

The study revealed that the heart is 'programmed' by the nutrition it receives during the gestational period inside the mother's womb. Gene expression modifications affect how carbohydrates and fat are metabolized inside the heart and additionally adjust the heart's dietary desire from sugar and in the direction of fat.

Researchers employed a mouse model that mimics human maternal physiology and placental nutrition transfer in obese women. The genetic makeup, proteins and mitochondria of the offspring of obese female mice were investigated using echocardiography and positron emission tomography (PET) scans both *in utero*, and after birth at 3, 6, 9 and 24 months.

A significant effect of sex was observed in the offspring's heart metabolism. The expression of 841 genes in female fetuses' hearts and 764 in male fetuses' hearts was altered, but only about 10% of genes were altered in both sexes. Poor heart function from birth was seen among male puppies born to obese mice, whereas females' cardiac function deteriorated with age. Estrogen might be responsible for the differences in long-term cardiovascular (CV) health and function among the genders. Young girls are hence less prone to CVDs but with age the levels of estrogen decline, thus enhancing the risk of heart diseases.

Experts stated that the study provides an insight into a mechanism that links maternal obesity with cardiometabolic disease in the future generation. It encourages health professionals to provide early-life therapy to avoid later-life cardiometabolic disorders and develop novel medications that target metabolism in the fetal heart. (*Source: Hindustan Times, May 13, 2022*)

Anti-inflammatory Drug Usage is Linked to Chances of Developing Chronic Back Pain

A recent study stated that inflammation is a normal element of recuperating from a painful injury and that suppressing or impeding inflammation may result in persistent pain that is more difficult to cure. Hence, the risk of developing chronic pain might be enhanced by using steroids and anti-inflammatory medicines such as ibuprofen.

According to the Centers for Disease Control and Prevention (CDC), 25% of individuals in the United States experienced low back pain in the previous 3 months, therefore experts were looking into the source of this. On analyzing the blood samples of persons who were cured of the lower back pain researchers revealed that they had substantial inflammation driven by neutrophils a type of white blood cell that helps the body fight infection.

They discovered that inhibiting neutrophils in rat models increased pain 10 times and administering anti-inflammatory agents and steroids also prolonged the pain.

Another study including over 5,00,000 participants in the United Kingdom revealed similar outcomes. Anti-inflammatory medicines were found to increase the likelihood of pain 2 to 10 years later in persons who used these drugs.

The study was published in *Science Translational Medicine* and suggested that reconsideration was necessary about pain treatment and more clinical trials on humans to confirm the same. (*Source: Medscape, May 13, 2022)*

Concerns were Raised Over WHO's Claim of Excess Mortality Rate

In the 75th World Health Assembly conducted in Geneva, our Union Health Minister, Mansukh Mandaviya raised concern over the recent claim of WHO (World Health Organization) regarding all-cause mortality. He stated that it is a concerning and dismaying situation where WHO did not pay attention to mortality rates based on our country-specific authentic data published by a statutory authority.

He conveyed the collective disappointment of the Central Council of Health and Family Welfare and exhorted the nation's commitment to building a resilient Global Health Security structure. He also stressed the need to build a global supply chain to ensure equitable access to vaccines and medicines that can be achieved by streamlining the WHO's approval process.

He also added that, as a responsible member of the Global community, India is ready to play crucial roles in these efforts and believes that this year's theme "Peace & Health" is timely as there can be no sustainable development, well-being and universal health without peace. (*Source: https://health.economictimes.indiatimes.com/news/industry/india-raises-concern-over-whos-claim-of-excess-mortality/91753781*)

IBD Medications Boost COVID-19 Vaccine Response

According to researchers at Cedar-Sinai COVID-19 vaccination strengthened immune response to the coronavirus inflammatory bowel diseases (IBD) patients even when they were on immune suppressant medications. The findings of the two studies published in the journals *IBD* and *Frontiers in Immunology* stated that IBD medications such as anti-TNF (tumor necrosis factor) suppress inflammation along with T-cells developed in the bone marrow.

Dr Balin Li, a Research Scientist, stated that T-cells response and anti-TNF therapy explain the association between medication and reduced hospitalization or death from COVID-19. He also added that the T-cells response test, a potential clinical assay can be used to monitor new vaccine and booster dose outcomes.

Jonathan Braun, PhD, a scientist stated that this study reassures the importance of vaccination in IBD patients with their therapies offering them added protection from a serious illness on hospitalization. This also encourages the patients and their doctors to continue their treatment and therapy during the pandemic. (*Source: https://www.news-medical.net/news/20220523/Biologic-medications-used-by-IBD-patients-boost-COVID-19-vaccine-response.aspx*)

Medical Advice from More Than One Doctor is a Holistic Approach

According to several clinical studies, a second opinion from radiologists or pathologists can uncover 10% to 50% of diagnostic errors. However, medical errors remain one of the leading causes of death in every country across the globe. This May, the US Department of Health and Human Services published a new report estimating the incidents of harm to Medicare patients throughout their hospital stay. Based on the report, they uncovered that nearly 1 quarter of the reported incidents led to increased treatment caused to rectify them with a conclusion that 43% of the incidents were avoidable.

In widely quoted statistics, 5.2 million avoidable medical errors in India are reported annually. According to research data by a Professor, Ashish Jha, Harvard University, 3 million medical errors resulting in death were reported in the last decade. Hence, in 2018, the Ministry of Health and Family Welfare implemented a National Patient Safety framework.

Second opinion, a multidisciplinary patient-centric care model reduces risk and prevents diagnostic error while saving the expenditure. It also empowers the patients to make an informed decision according to their conditions and be backed by the best possible care available. According to several medical experts empowering patients guided by suitable experts is the key to reducing medical error and optimizing outcomes through collaborative and transparent means. (*Source: https://health.economictimes.indiatimes.com/news/health-it/why-second-opinions-alone-are-not-the-solution-to-safer-and-more-affordable-patient-outcomes/91745080*)

Contact Tracing Process Stepped Up Given Omicron Subvariant

In India, contact tracing to look for the spread of viral infection, clustering and occurrence after the detection of BA.4 and BA.5 has intensified. Both subvariants were first reported in South Africa that have now spread to several countries. The subvariants have been held responsible for the 5th wave in South Africa.

Dr NK Arora, Head of COIVD working group of India, National Technical advisory group on immunization stated that the group will not leave any stones unturned to complement genome sequencing along with sewage surveillance. The experts suggest that the subvariants share similarities with BA.2 variant responsible for the 3rd wave in India. Anurag Agarwal, INSACOG, and WHO Advisory Group stated that the antigenic property of the subvariants is far away from BA.1 variant hence there will be no effective prevention against reinfection. However, in India BA.2 subvariant was the cause behind the surging cases which is somewhat similar to the new variants. So, the risk of infection is very low in our nation.

According to South African data, there is no significant difference in severity, as the severity is dependent on the percentage of the population vaccinated. (*Source: https://health.economictimes.indiatimes.com/news/policy/govt-steps-up-contact-tracing-in-view-of-omicron-sub-variants/91754598*)

National Resource Centre for Oral Health and Tobacco Cessation Established in Delhi

The Delhi government has set up a National Resource Centre for Oral Health and Tobacco Cessation in the metropolis to fight tobacco addiction. Recently, state Health Minister Mr Satyendar Jain opened the center, which the administration claims is the first of its kind in the country. It was founded at the Maulana Azad Institute of Dental Sciences (MAIDS) to raise awareness about the dangers of cigarettes and drugs, improve dentist training and conduct dental health research. According to the government, this is the first national resource centre among the country's 315 dentistry colleges.

MAIDS' Director Dr Sangeeta Talwar stated that the center would actively participate in and carry out training of dental health professionals in patient care, research and tobacco cessation. (*Source: ETHealthworld, May 25, 2022*)

■■■■

The Spiritual Prescription "I am Sorry"

Two hardest words for a doctor to say: "I'm sorry". Most defense lawyers counsel doctors to not apologize to patients. Their view is that if you say you're sorry for something, you are implicitly taking some degree of responsibility for whatever has happened. In other words, you are pleading guilty. The complainant's lawyers may use a doctor's apology to the maximum extent possible to show the doctor knew what they did was wrong. The usual approach is to deny and defend. But,

- Apologizing after a medical error is the humane thing to do.
- Patients often sue simply because it's the only way to find out what went wrong.
- Erecting a wall of silence is enough to make someone very angry. And it's awfully easy for an angry person to find a lawyer who will listen to them. At that point, it's too late to say sorry.
- Over 35 states in the USA have passed laws prohibiting doctors' apologies from being used against them in court. (Apology laws)
- By promptly disclosing medical errors and offering earnest apologies and fair compensation, one can hope to restore integrity to dealings with patients, make it easier to learn from mistakes and dilute anger that often fuels lawsuits.

Apology, the spiritual answer

- The word 'sorry' is synonymous with apology.
- To err is human, and to admit one's mistake is superhuman.
- Sorry should be heart-felt and not ego-felt. You should not only say sorry but also appear as being genuinely sorry.
- A huge amount of courage is required to face the victim of our wrong doing and apologize.
- Those who are in harmony with their life, and consequently with themselves, find it easier to say sorry. They are the positive, conscientious people who are at peace only after making amends for their wrong doing.
- The word 'sorry' in itself is instilled with tremendous potential and power. Within a fraction of a second, grave mistakes are diluted, estranged relations are brought alive, animosity and the bitterness are dissolved, misunderstandings are resolved and tense situations ease out, giving way to harmony and rapprochement.
- To forgive and forget is a common spiritual saying.
- Remember, we all make mistakes and seek forgiveness from GOD every day.

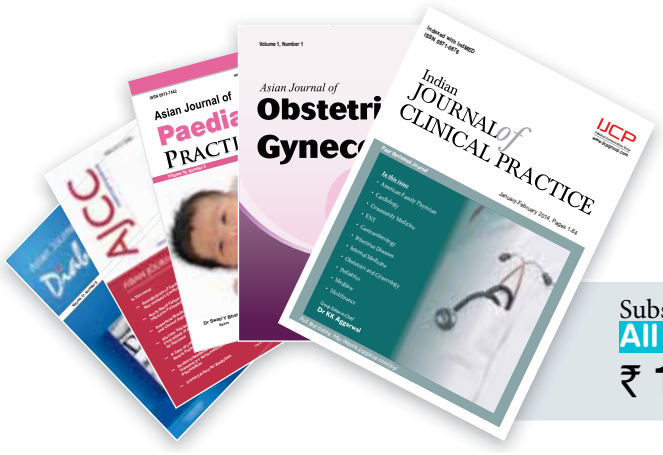
■■■■

Monkeypox may be Treated with Antivirals

According to a study published in the British medical journal *Lancet*, certain antiviral drugs may have the ability to lessen the time a patient is contagious and shorten the symptoms of monkeypox.

Monkeypox is a rare viral infection that is designated as a high consequence infectious disease (HCID) by the UK Health Security Agency. It is closely related to the smallpox virus. Monkeypox has no approved therapies, and there is little information on how long it is contagious, with an incubation period varying from 5 to 21 days. Monkeypox virus was also found in blood and throat swabs, according to the researchers.

Researchers evaluated the effect of antiviral drugs brincidofovir and tecovirimat (used to treat smallpox) on patients. No significant therapeutic benefit was found with the brincidofovir, although it did indicate that more research into the potential of tecovirimat was needed. However, the authors of the report stated that more research into antivirals to treat this neglected tropical disease was necessary. (*Source: ETHealthworld, May 25, 2022*)



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Lighter Side of Medicine

INSPIRATIONAL STORY

LAUGHTER IS THE BEST MEDICINE

Several years ago, Norman Cousins was diagnosed as being terminally ill and was given 6 months to live. He was told that his chance for recovery was 1 in 500. He came to realize that worry, depression and anger in his life had contributed to his disease. He started wondering that if illness could be caused by negativity, could wellness be created by positivity. He thought of making an experiment of himself. Laughter was among the most positive activities he could think of. He rented several funny movies including those of Keaton, Chaplin, Fields and the Marx Brothers. He read funny stories, asked his friends to call him whenever they said, heard or did something funny. He could not sleep many a times due to his pain, but he noted that laughing for 10 minutes relieved his pain for several hours, and he could sleep. Eventually, he completely recovered from his illness and lived another 20 happy and healthy years. He talked about his journey in his book "Anatomy of an Illness". He credits his recovery to visualization, the love of his family and friends, and laughter.

People sometimes think that laughter is a waste of time. It is a luxury. But that's not the truth. Laughter is essential for our equilibrium and our wellbeing. Laughter helps us get well and stay that way. Since Cousins' work, scientific studies revealed that laughter has a curative effect on the body, the mind and the emotions. Indulge in laughter as often as you can.

Use whatever makes you laugh – movies, sitcoms, books, cartoons, jokes and friends. Laugh long and loud. People may think you're strange, but sooner or later they'll join in even if they don't know what you're laughing about.

Some diseases may be contagious, but none of them is as contagious as the cure… laughter.

(***Source:*** *Peter McWilliams. Chicken Soup for the Cancer Survivor's Soul: Healing Stories of Courage and Inspiration By Jack Canfield, Mark Victor Hansen, Patty Aubrey, Nancy Mitchell, Beverly Kirkhart*)

HUMOR

THREE PROFESSIONALS

A Mechanical, Electrical and Computer Engineer were riding together to an Engineering Seminar; the car began jerking and shuttering.

The mechanical engineer said, "I think the car has a faulty carburetor."

The electrical engineer said, "No, I think the problem lies with the alternator."

The computer engineer brightened up and said, "I know, let's stop the car, all get out of the car and get back in again!"

A LEAVE LETTER TO THE HEADMASTER

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

BAD EATING HABITS

Complaining to her consultant about her daughter's strange eating habits, a woman said that the daughter lies in bed all day and eats yeast and car wax. What will happen to her?

The consultant said, "She will rise and shine."

Dr. Good and Dr. Bad

SITUATION: A 52-year-old, type 2 diabetic male was suggested to eat a starch-restricted, fiber-rich functional bread, with an increased β-glucan/starch ratio.

LESSON: It has been reported that a starch-restricted, fiber-rich functional bread, with an increased β-glucan/starch ratio helps in ameliorating long-term metabolic control. Thus, it could be regarded as a beneficial dietary treatment for T2DM.

Nutrients. 2017;9(3):297.

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- The introduction should state why the study was carried out and what were its specific aims/objectives.

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- These should be described in sufficient detail to permit evaluation and duplication of the work by others.
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- These should be concise and include only the tables and figures necessary to enhance the understanding of the text.

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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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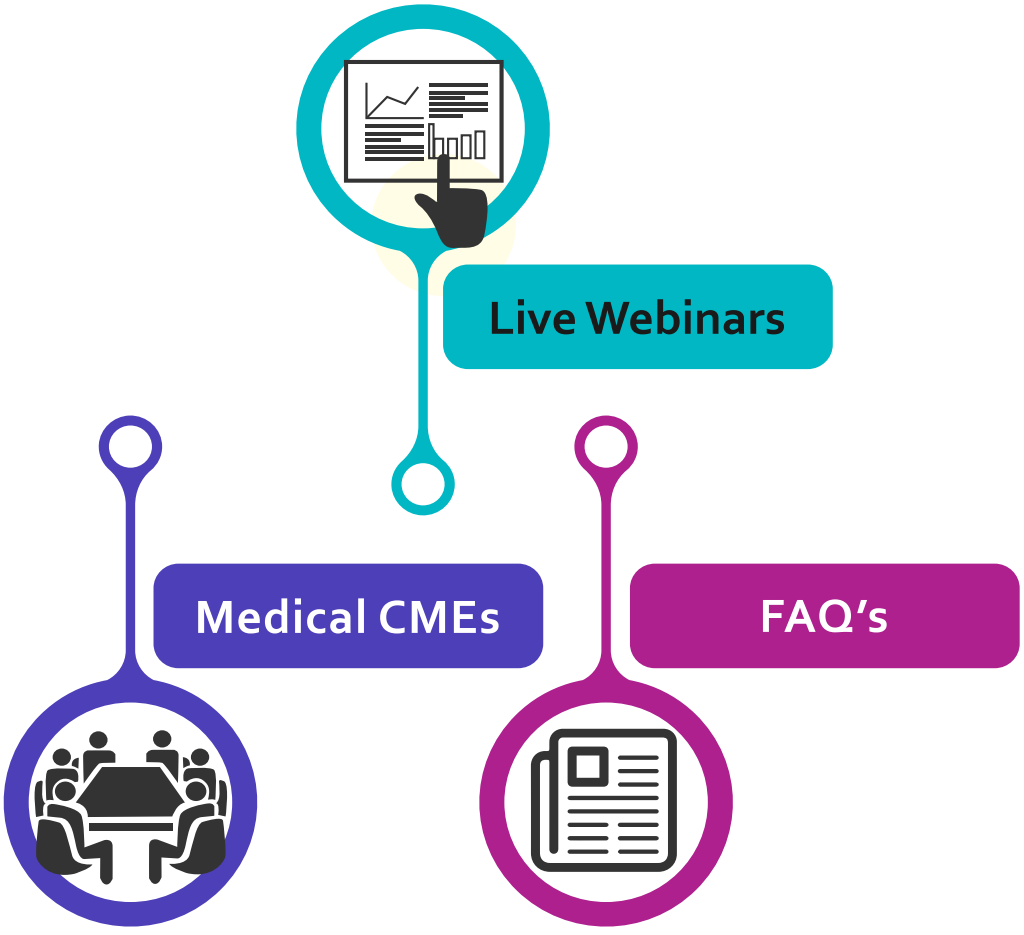

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