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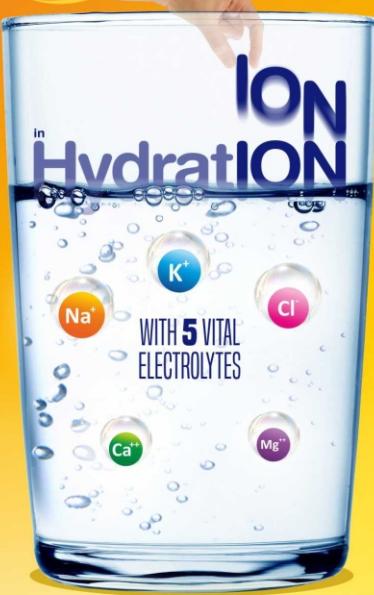
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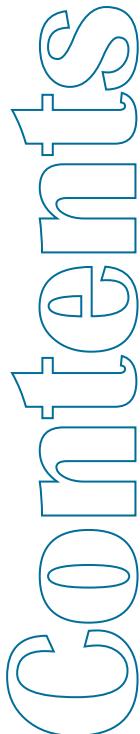
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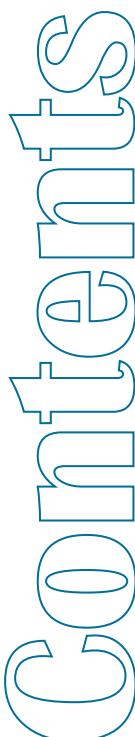
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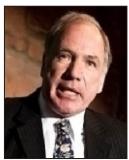
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Health is a Human Right

Man proposes but God disposes — is an archetypical excuse given by most of us as an excuse of failure, be it big or small. The question is however whether it is really the Destiny named God who puts the hurdle between our effort and success or whether it is Man himself who falls prey to his own wrong and unpragmatic decisions? Let me share one of my experiences with you all. When I was a medical student during eighties in the last century I, along with all the budding doctors of my batch, were pleased to know that by the beginning of the 21st century Health for all would be established or the target had been laid as such by WHO. The denizens of the World would then be blessed with the uniform facility of health. Ironically however we have almost reached the first quarter of 21st century and yet the world is languishing under the clutch of deteriorating health, health care system and poverty¹.

Reality is 'More than half (55%) of the global population was estimated to lack access to safely-managed sanitation services in 2017, and more than one quarter (29%) lacked safely-managed drinking-water. In the same year, two in five households globally (40%) lacked basic hand-washing facilities with soap and water in their home. Globally in 2016, unsafe drinking-water and sanitation, and lack of hand hygiene were responsible for nearly 1.2 million deaths, including almost 300 000 of children aged under 5 years who died due to diarrhoea'². Condition in India is not different^{2,3}.

Under the title WORLD HEALTH DAY 21, WHO has published an article⁴ in their webpage categorizing the problems faced by the present world laying focus especially on health. Our world is an unequal one - under this subtitle the global health Messiah has, without any circumlocution, clearly stated that the recent pandemic has taught us that we live in a world where some people lead a healthy life and has access to better health care where as the others linger under the looming shadow of gross neglect and poverty. The rich getting richer and the poor getting poorer - the common axiom of capitalism also applies to the health care where the privileged class is blessed with the boon of modern health facilities whereas the underprivileged are cursed with the bane of social aloofness as if they are duds ostracized by the society.

WHO has got judgmental at this point and has proclaimed that not only this

bias allotment of facilities is unfair but the situation can be rectified. The apex body of world health invites all the leaders of the world to play a decisive and urgent role to ensure that quality health care is available to all irrespective of whether a man is rich or poor at affordable price or free of cost when they need them.

According to WHO although COVID has buried its fangs throughout the world but the worst affected are the vulnerable sections of the world population already suffering from poor health, sanitation, employment and a plethora of other problems.

Allow me to reiterate a point again. In 1977 the 30th World Health Assembly

decided that the prime social target in the ensuing decades for Governments, as for the WHO, should be 'the attainment by all citizens of the world by the year 2000 AD of a level of health that will permit them to lead a socially and economically productive life' (WHO, 1979). This goal got upgraded into a slogan Health for All by the Year 2000 AD. But what has jeopardized the effort to attain the set target^{5,6}? Let us discuss it from our own Nation's point of view. Although the Indian economy has achieved high growth rates in recent years (9.4% in 2005–06 and 9.6% in 2006–07, with a consistent 7.0% growth rate even during the period of global economic slowdown), according to the Human Development Index (HDI), India is still ranked 131 among 189 countries⁷. Surprisingly however India's economic transformation has not produced tangible improvements in the health of the nation, and the awareness that improvement in health contributes to accelerated economic growth has not yet sipped into

World Health Statistics 2008						
Member Country	Risk Factors					
	Access to improved drinking-water sources (%)			Access to improved sanitation (%)		
	Total	1990	2000	2006	Total	1990
India	71	82	89	14	23	28
Germany	100	100	100	100	100	100
Japan	100	100	100	100	100	100
Chile	91	93	95	84	91	94
China	67	80	88	48	59	65

World Health Statistics 2020						
Member Country	Proportion of population using safely-managed drinking-water services (%)	Comparable estimates 2017	Proportion of population using safely-managed sanitation services (%)	Comparable estimates 2017	Proportion of population using a hand-washing facility with soap and water (%)	Comparable estimates 2017
India	—	—	—	—	60	—
Germany	>99	99	97	99	—	—
Japan	98	99	99	99	—	—
Chile	99	99	77	77	—	—
China	—	72	72	72	—	—

the minds of the learned planners. This has led to inadequate investment in the health sector which in turn has led to the inadequate improvement in the efficiency of health care. India stands at 170 out of 188 countries in domestic general government health expenditure as a percentage of GDP, according to the Global Health Expenditure database 2016⁸ of World Health Organization.

Universal Health Care was the means by which Health for All by the Year 2000 AD was conceived to be attained. Health for All was only possible if all were marshalled for Health. This meant not only the participation of governments

and medical establishments, but people themselves. Universal health care⁹ is per say, health care made universally accessible to individuals and families in the community by means acceptable to them, through their full participation and at a cost the community and what the country can afford. The role of health experts or doctors is similar to that of a gardener fighting insects and weeds. Their work is over. Universal health care is the crusade of the health conscious people. Its execution and implementation depends on knowledge of proper disposal of services and a incessant demand from an active and quality conscious consumer—the public. Strong political volition, community participation and coordination are its basic principles. Strangely both National Health Policy 1983 and 2002 failed to confer the status of a Right to health, while most other nations are planning newer strategies to put Right to Health and Medical Services into practical execution. Community participation in health is an aphorism that

still awaits genuine recognition in many countries of the world, notably of the third world. India, unfortunately, is no exception. Successive Five Year Plans in India have reduced percentage spending over health as a part of GDP, which is a bad omen.

Public awareness and activism alone can rectify this alarming condition. The people should realize that health is not only a commodity that a benevolent government bestows on them but it has to be demanded and maintained by the citizens of the state themselves. Health problems are impossible to be tackled in isolation. They will evidently be a part of our struggle for an egalitarian society, because better health care is a sign of a more concerned government and overall a conscious set of citizens. The Constitution of India recognizes the right to life and liberty of every individual.

Every cloud has a silver lining and the silvery lining to all the looming darkness, as discussed above, is the slow maneuver of the Government towards recognition of Health as a major cog in the turning wheel to success^{10,11}.

In spite of the laudable steps taken by the Government as stated above there is no scope for self complacency. The Government should ensure HEALTH AS A RIGHT and mere investment in Insurance sector will only lead to partial misallocation of public funds. Drastic improvement in the Health Infrastructure as improving the doctor to patient ratio, keeping the cost of essential medicines within the reach of the common man and plethora of other things needs to be done with absolute urgency. With the proper good will of the government combined with public awareness and participation achievement of such in near future is not impossible.

This, along with sustained strengthening of primary healthcare system and steady growth in medical infrastructure which includes better trained medical staffs in adequate numbers with state of art technology will certainly bring about a health revolution in India.

Fundamentals to achieve good health are Food, Nutrition, Housing, Education and Culture to say a few. When all conscious citizens of a country will raise their voice in unison to demand their right to live a

healthy life the Government, as People's representative must listen to the public demand. Allow me, my august readers; to end this editorial with some lines from a poem whose bard (Rabindranath Tagore) needs no introduction:

"Where tireless striving stretches its arms towards perfection;

Where the clear stream of reason has not lost its way into the dreary desert sand of dead habit;

Where the mind is led forward by thee into ever-widening thought and action

Into that heaven of freedom, my Father, let my country awake."

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Original Article

Effect of Counseling on the Mental Status of Undergraduate Medical Students During the Pandemic — A Prospective Quasi-experimental Study at a District Medical College of West Bengal

Lopamudra (Dhar) Chowdhury¹, Tanmoy Biswas², Ritu Ghosh³, Anurag Chaudhuri⁴

Background : Studies show that COVID-19 Pandemic has affected the mental health of all including medical students who already suffer from depression and anxiety but there are not enough studies regarding steps taken towards improving their mental health.

Methods : In this study, undergraduate medical students were screened for depression, anxiety or stress. Counseling in the form of small group and positive motivation was started as an institutional program before the pandemic. The counseling process continued throughout the period of lock down via mobile and what's app messages. The DASS 21 score of this group in March was compared with the DASS 21 score of November and analyzed for any statistical significance.

Results : The mean score of depression of these students was 14.46 ± 6.351 and 8.58 ± 6.178 after intervention, mean score of anxiety was 11.04 ± 4.539 and at end of study 5.44 ± 3.445 , mean stress level was 15 ± 5.299 and 8.12 ± 5.472 at the end of study, Paired T tests showing $p < 0.0001$.

Conclusion : The above study thus proves that counseling and positive motivation, of vulnerable students, significantly improves their mental health status in stressful situations like the Pandemic.

[J Indian Med Assoc 2021; 119(4): 14-8]

Key words : Mental health, Medical students, Pandemic.

Various studies undertaken in 43 countries reveal that depression or depressive episodes affect about 27% of medical students throughout the world. Medical students are at high risk for depressive symptoms and suicidal ideation¹. Symptoms of depression, anxiety or stress may reflect upon their day to day activity, leading to social withdrawal, lack of interest in studies, feeling of hopelessness and even suicidal tendencies². The WHO had declared the COVID 19 outbreak as a Pandemic on March 11, 2020. By September, India was declared as the world's second worst hit nation, following the United States of America. The Government of India, declared a nationwide lockdown on 25th March, as a measure against spread of infection. Public health emergencies like the Severe Acute Respiratory Syndrome (SARS), Middle East respiratory Syndrome (MERS) and Ebola outbreak were associated with increased psychological stress in the affected population¹. Studies confirm that

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Editor's Comment :

- Depression, anxiety and stress are prevalent among medical students and might increase in stressful situations like the pandemic.
- Mental support, sympathy and positive motivation given to vulnerable students by faculties of the institute can certainly improve their mental state.
- Each medical institute should have a supportive cell to help out students in dire need and prevent catastrophes like incidents of suicides or acute depression.

maladaptive behaviors, anxiety, depression and suicidal tendencies were common due to social isolation. Moreover, social isolation, lack of freedom, concerns for friends and family are negatively affecting the mental health of all, especially the medical students². The mental health of medical students was found to be poorer compared to the general population. It has been found that one in three medical students were found to be suffering from anxiety, which is higher than in the normal population³. Earlier studies during previous pandemics show that mental status of health workers are negatively affected. Recent studies on the mental status of medical students too prove that there is an increase in anxiety and depression in them. Medical students are already stressed due to their extensive syllabus, adaptability to various challenging situations, multiple examinations and the lifestyle they lead. The present Pandemic has created additional

stress, anxiety, even depression regarding isolation, online classes, concern regarding their own health and that of their family members, worries regarding their assessments and examinations. Depression, anxiety and stress affect a considerable proportion of undergraduate medical students in India and systemic efforts are needed to address their concerns and provide mental health care as necessary to them⁴. Counseling and positive motivation of vulnerable students to handle this stressful situation will certainly be of benefit to them to decrease the associated depression, anxiety and stress, preventing suicidal tendencies and hazardous consequences.

AIMS AND OBJECTIVES

- (1) To assess the mental status of undergraduate medical students during the Pandemic.
- (2) To compare their present mental status to their status before counseling.
- (3) To assess whether counseling had any positive effect on their mental well being.

MATERIALS AND METHODS

Study population– Undergraduate medical students of 1st and 2nd professional MBBS.

Study design – retrospective quasi-experimental study.

Study population - 225

Place of Study – Murshidabad Medical College & Hospital.

Duration of Study – 9 months.

Sample size – 28.

Inclusion criteria- Students of first and second Professional MBBS of Murshidabad Medical College & Hospital who are willing and not undertaking any medication or counseling.

Exclusion criteria – Students suffering from any illness or under any medication.

Students of 1st and 2nd Professional MBBS students of Murshidabad Medical College and Hospital were screened for notable depression, anxiety and stress by standardized questionnaire as per Depression, Anxiety and Stress Scale (DASS-21) criteria after obtaining permission from Institutional Ethics Committee and individual consent. Of these, 28 students were selected and interrogated regarding their individual problems, which created depression, anxiety or stress in them. Students were counseled in small groups, individually by direct conversation, over phone as well as via positive motivational messages at weekly intervals throughout the study period. They were assured assistance from faculties in case of any need. The ongoing counseling of the above group of

students were continued even during the Pandemic, when they were at home via messages and WhatsApp group activities. Various citations of notable authors of authentic books were constantly posted to them to keep up their mental strength during the pandemic. The counseling was validated by the Head of the Department of Psychiatry of the Institute. When the Pandemic situation seemed to normalize with gradual opening up of essential activities, the mental status of this group was compared with their initial mental status before counseling as of DASS -21 score and the data analyzed statistically for any significance. Data of 28 students could be collected for final analysis. Those students, who did not undergo counseling or the control group, who did not require any counseling as their DASS-21 score was within normal limits. After the Pandemic, analysis of their DASS-21 scores showed 17.8% of them were found to be suffering from mild to moderate degrees of depression, anxiety and stress which was non-existent before the Pandemic.

RESULTS

Statistical analysis of data collected from students on counseling, prior to intervention and finally at the end of study period confirm that counseling and positive motivation had significant effect on their mental status during the Pandemic. The mental status of those not undergoing counseling was within normal limits prior to the Pandemic but at the end of the study, 17.8% of these students were found to be suffering from mild to moderate degree of depression, anxiety and stress as detected from their DASS-21 score at the end of the Pandemic. The mean score of depression of the students who underwent counseling from faculties and availed their help was 14.46 ± 6.351 and at the end of study was 8.58 ± 6.178 , paired T test confirms $p<0.0001$. Their mean score of anxiety prior to study was 11.04 ± 4.539 and at end of study 5.44 ± 3.445 , $p<0.0001$. Their stress level prior to study was 15 ± 5.299 and end of study 8.12 ± 5.472 , $p<0.0001$. This proves that preventive counseling of undergraduate medical students has a significant role in a Pandemic.

ANALYSIS

Data were described by means and standard deviation. Normality test revealed that the data was normally distributed and hence parametric paired t-test was undertaken to compare the difference in means before and after the study. $P<0.05$ was considered as the level of significance.

The cut off scores for depression, anxiety and stress were considered at 10, 8 and 15 respectively¹³. A high score for any of the subscales was used to

screen subjects for inclusion in the study. The total score was calculated by multiplying the scores on DASS-21 by 2.

The total DASS 21 cut off score was considered ≥ 60 .

Fig 1 shows the total DASS scores at baseline and post intervention. A significant decline was observed in the overall scores at the end of the counseling program. However increment in score was observed among two subjects. The baseline and post intervention scores ranged from 52 -146 and 4 to 110 respectively. The number of subjects having score ≥ 60 declined from 24 in the intervention phase to 11 in the post intervention phase.

Table 1 depicts the mean scores of subscales on DASS scale of the study subjects at baseline and post intervention. The baseline scores were noted at the wake of the pandemic prior to declaration of lockdown. The post intervention scores were recorded in the month of November, 2020. It is evident from the table that the mean depression, anxiety and stress scores declined significantly in the post intervention phase compared to the baseline scores.

The depression score declined from 14.46 ± 6.351 to 8.58 ± 6.178 , anxiety from 11.04 ± 4.53 to 5.44 ± 3.445 while stress declined from 15.00 ± 5.299 to 8.12 ± 5.472 and the differences were noted to be highly significant ($P < 0.0001$).

DISCUSSION

It is already established that the prevalence of depression as well as anxiety is more among the medical students, compared to the general population². Studies show that the medical community has been greatly affected by the COVID-19 pandemic and the medical students too face unique challenges and uncertainty during this period^{3,4}. Studies also reveal that negative psychological effects due to quarantine, frustration, boredom, confusion, stress symptoms were affecting the worldwide population⁵⁻⁸. In this study the mental health status of undergraduate medical students was assessed by standardized DASS-21 questionnaire. The DASS 21 scale comprises 21 items, with seven each for

screening depression, anxiety and stress. The total sub score ranges from 1 to 42 and is categorized into mild, moderate, severe and extremely severe categories^{11,13}. In this study, participants were selected as per standardized psychometric analysis scale^{13,14}, the DASS 21 scale, the cut off scores of depression, anxiety and stress being 9,7 and 14 respectively. The mental status of this group was compared prior to counseling and after the pandemic; the counseling and positive motivation continuing at weekly intervals throughout the phase. The data collected was analyzed by paired 't' test, and the difference in their depression, anxiety and stress score, was found to be significant. Even though studies show

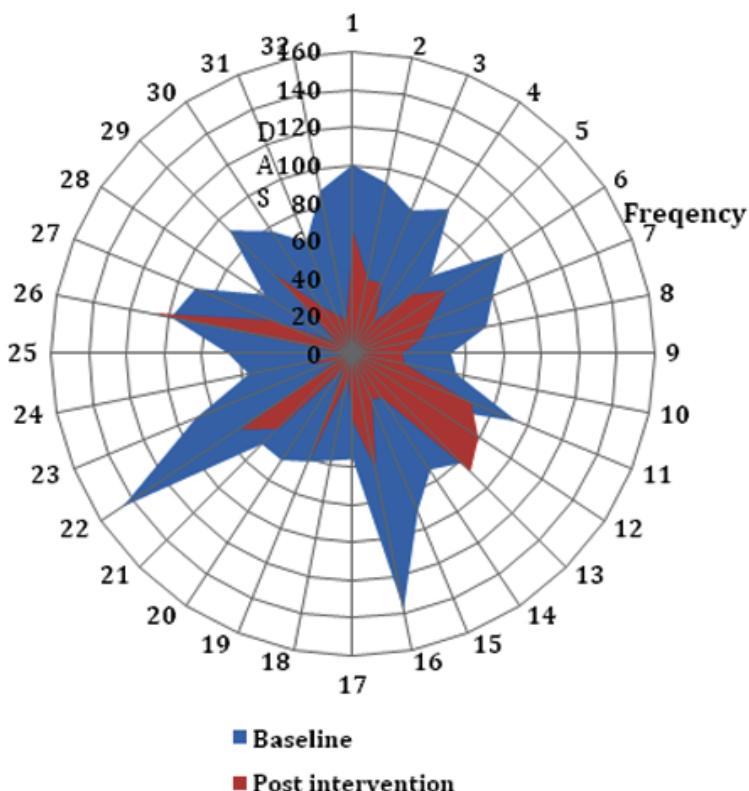


Fig 1 — Distribution of study subjects according to Baseline and post intervention DASS score

Table 1 — Comparison of mean scores of subscales on DASS scale at baseline and post intervention phases

	Mean score at baseline	Mean score at last post intervention phase	Paired t, Significance
Depression	14.46 ± 6.351	8.58 ± 6.178	$6.895, P < 0.0001$
Anxiety	11.04 ± 4.539	5.44 ± 3.445	$5.74, P < 0.0001$
Stress	15.00 ± 5.299	8.12 ± 5.472	$7.269, P < 0.0001$
Overall	79.56 ± 22.05	60.71 ± 25.34	$3.08, p = 0.0018$

that the Pandemic increased the depression and anxiety among medical students globally^{9,10,12}, this interventional study, on the contrary shows that instead of rise there has been a decrease in depression, anxiety as well as stress in the group of medical students who were under counseling. Of those students, who did not undergo counseling as their DASS 21 score was within normal limits, 17.8% of them were found to be suffering from mild to moderate degrees of depression, anxiety and stress in the later period of the Pandemic. Thus it proves that constant mental support, positive motivation from faculties of the institute do produce an impact on the mental status of undergraduate medical students, giving them mental support during the Pandemic, when the general population, including the health workers and medical students throughout the globe were suffering from anxiety and depression.

CONCLUSION

Depression, anxiety and stress are present in the medical students due to their extensive syllabus, multiple examinations and the lifestyle they lead. There is every possibility of increase in their depression and anxiety in stressful conditions like the present Pandemic situation. This study shows that positive motivation and counseling in times of stress like the Pandemic can provide mental support to the vulnerable population, especially the medical students, who are already stressed, over anxious or depressed. The Pandemic situation itself induces depression, anxiety and stress in normal population due to social distancing, the disease and its outcome, altered societal environment and for the medical students, additional stress due to uncertainties of examination system and online classes. Counseling and positive motivation can certainly help out medical students to handle the stress. This can certainly prevent the hazardous consequences of depressed mental states like suicidal tendencies, absenteeism and decrease in academic performance of students.

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(1) Dr Ranjan Bhattacharya, Head of the Department (Psychiatry), Murshidabad Medical College and Hospital, Behrampore, Murshidabad, West Bengal

Table 2 — Comparison of mean DASS scores at baseline and post intervention phases			
Variable	Mean score at baseline	Mean score at 1st last post intervention phase	Paired t, P
Depression	14.46± 6.351	9.12±8.056	3.6, P=0.001
Anxiety	11.04±4.539	7.04±4.56	3.5, P=0.002
Stress	15.00±5.299	10.58±7.788	3.15, P=0.004
Mean score at 1st Post intervention phase		Mean score at last post intervention phase	
Depression	9.12±8.056	8.58±6.178	0.478, P=0.679
Anxiety	7.04±4.56	5.44±3.445	1.203, P=0.214
Stress	10.58±7.788	8.12±5.472	1.17, P=0.86
Mean score at baseline		Mean score at last post intervention phase	
Depression	14.46± 6.351	8.58±6.178	6.895, P<0.0001
Anxiety	11.04±4.539	5.44±3.445	5.74, P<0.0001
Stress	15.00±5.299	8.12±5.472	7.269, P<0.0001

It is evident from the Table that the mean depression, anxiety and stress scores declined significantly in the first and last post intervention phases compared to the baseline scores. However no significant difference was observed across the 1st and the last intervention phases.

(2) 1st and 2nd Professional MBBS Students of Murshidabad Medical College and Hospital, Behrampore, Murshidabad, West Bengal

Ethical Clearance : Approval has been attained from the Institutional Ethics Committee of Murshidabad Medical College & Hospital.

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Conflict of Interest : There is no conflict of interest. No financial help of any kind has been taken.

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— **Hony Editor**

Original Article

Assessing Impact Event Scale of Post-traumatic Stress Disorder of COVID-19 Pandemic among Postgraduates Working at Tertiary Care Hospital — A Cross-sectional Study

Rekha S Udgiri¹, Sunil G Biradar², Mohd Shannawaz³

Background : COVID-19 is an infectious disease caused by the most recently discovered Corona Virus. The pandemic is having a significant psychological impact worldwide as evidenced by continued reports of panic and fear along with heightened anxiety and depression reported in the literature and news. The Indian Psychiatry Society (IPS) has noticed a steep rise in the number of patients suffering from mental illness after the outbreak of the Novel Corona Virus in India. Post-traumatic stress disorder (PTSD) is a psychiatric disorder that can result from the experience or witnessing of traumatic or life-threatening events such as disasters.

Objectives : (1) To know the impact of COVID-19 among postgraduates working at medical college. (2) To give counseling based on the score of the impact event scale.

Methodology : This was a cross-sectional study conducted among postgraduates (PGs), within one month after the event of the COVID-19 case was diagnosed in the selected medical college. After taking institutional ethical clearance and consent from the PGs the study was conducted. The data was collected by semi-structured questionnaires and using a structured format of The Impact Event Scale-Revised (IES-R). Proform was sent to them through email and requested them to reply within a week.

Results : The total IES-R score of more than 37 were found in all the PGs, but the severity was more in final year PGs. more than 24 IES-R scores were observed more in first year PGs.

Conclusion : The finding of the present study concludes that the COVID-19 pandemic was associated with severe stressful impact on postgraduates working at tertiary care hospital.

[J Indian Med Assoc 2021; 119(4): 19-23]

Key words : COVID-19 pandemic, Postgraduates, Impact event scale of PTSD.

COVID-19 is an infectious disease caused by the most recently discovered Coronavirus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019^{1,2}. The pandemic is having a significant psychological impact worldwide as evidenced by continued reports of panic and fear along with heightened anxiety and depression reported in the literature and news³. The Indian Psychiatry Society (IPS) has noticed a steep rise in the number of patients suffering from mental illness after the outbreak of the Novel Coronavirus in India⁴. Post-traumatic stress disorder is a psychiatric disorder that can result from the experience or witnessing of traumatic or life-threatening events such as disasters^{5,6}. Studies from India have shown the presence of psychiatric morbidity after various natural

Editor's Comment :

- In the present study, COVID-19 pandemic was associated with severe stressful impact on postgraduates working at tertiary care hospital.
- Regular counseling sessions are required for everyone as COVID-19 pandemic as it is still ongoing and increase in peak stage.
- It is a novel coronavirus and published literature is not much available in general. These findings would need to be verified in a larger sample size and follow up of the study participants to see the effect symptoms of psychological disorders.
- Both health professionals and community people are panicked about the COVID-19 pandemic. It may take few more months to know the epidemiological determinants of disease.

as well as man-made disasters, PTSD in post-disaster on the affected population has been useful in identifying people in need of psychosocial interventions⁷, WHO Director-general declared COVID-19 outbreak as a public health emergency of international concern (PHEIC) on 30th January 2020⁸.

Many times the Health care providers have to face an increased workload and they have been quarantined when they come in contact with infected patients⁹.

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Fear of infection will be very common during the outbreak, worries about caring for such patients, adequacy of protection, taking infections to their families, long working hours, inadequate access to food, liquids and rest, and separation from families can lead to severe psychological distress among health professionals.

Researchers found that worrying a lot about the illness was associated with worse mental health in the long run. Healthcare workers had worse long-term mental health outcomes than other groups. The present study was attempted to know the impact PTSD of COVID-19 pandemic among postgraduates (PGs) who are frontline workers in the institution.

In the above context, the main objectives of this study were:

1. To know the impact of COVID-19 among postgraduates working at Medical College.
2. To give counseling based on the score of the impact event scale.

MATERIALS AND METHODS

This was a cross-sectional study conducted among postgraduates working at tertiary care hospital. The data was collected one month after the event of the COVID-19 case was diagnosed at selected medical college. After taking consent from the PGs, the study was conducted. Those who gave the consent only has filled the self-reported form. The semi-structured questionnaire was used to collect data regarding socio-demographic details and using a structured format of The Impact Event Scale-Revised (IES-R)¹⁰. Proform will be sent to them through email and requested them to reply within a week. A total of 80 PGs participated in the study. The sample size was sufficient to validate the results with a 95% confidence level and margin of error of $\pm 10\%$. Data were collected by the Purposive Sampling method. All characteristics were summarized descriptively. For continuous variables, the summary statistics of mean \pm standard deviation (SD) were used. For categorical data, the number and percentage were used in the data summaries and diagrammatic presentation. Chi-square (χ^2) test was used for the association between two categorical variables. The difference between the means of analysis variables between two independent groups was tested by unpaired t-test. The difference between the means of analysis variables between more than two independent groups was tested by ANOVA and F test of testing of equality of Variance. Data were analyzed using SPSS software v.23.0, and Microsoft office 2007. Differences in proportions and means were assessed by χ^2 test.

The impact event scale –revised (The IES-R) tool :¹⁰ Posttraumatic stress disorder (PTSD) is the development of characteristic symptoms after exposure to one or more traumatic events. It is very helpful in measuring the effect of routine life stress, everyday traumas, and acute stress. Participants were asked to rate the level of distress for each component during the previous seven days of their interview. The IES-R is a self-report measure designed to assess current subjective (COVID -19) distress for a specific traumatic life event. Responses to 22 items are scored and summed to a maximum score of 88.

Score Interpretation (IES-R) :

24 and more : PTSD is a clinical concern. Those with scores this high who do not have full PTSD will have partial PTSD or at least some of the symptoms (Asukai & Kato 2002)¹¹.

33 and more : This represents the best cutoff for a probable diagnosis of PTSD (Creamer *et al* 2002)¹².

37 and more : This is high enough to suppress your immune system's functioning (even 10 years after an impact event) (Kawamura *et al* 2001)¹³.

The IES sub-scores were derived by dividing the total score in a subgroup by the total number of items in it. The subscales measure different dimensions of a stress response. It is helpful to measures the subscale in the response sets of intrusion (intrusive thoughts, nightmares, intrusive feelings, and imagery, dissociative-like re-experiencing), avoidance (numbing of responsiveness, avoidance of feelings, situations and ideas) and hyperarousal (anger, irritability, hypervigilance, difficulty concentrating, heightened startle), subscale scores which was calculated for the intrusion (consisting of the following items :1,2,3,6,9,14,16,20), avoidance (consisting of the following items : 5,7,8,11,12,13,17,22), hyperarousal (consisting of the following items : 4,10,15,18,19,21). The score range from 0 through 4. A mean score of 2 on a specific subscale was indicated as the appropriate cut-off¹⁴.

RESULTS

A total of 80 PGs participated in the study. 54% of them had mild PTDS symptoms followed by moderate (20%) and the mean range of their age group was 27.4 ± 2.4 . The majority of them were female (54%) and belongs to Clinical Departments (93%).46% of the PGs were in the first year followed by second-year (33%) and 21% of them were in the third year.

Among them, 34% of them were subjected to secondary contact and are self-quarantined followed by 24% of them were subjected to primary contact

and were quarantined at the institution. 44% of them were not exposed to either primary or secondary contact. 88% of the PGs were staying away from home. 89% of residents didn't have any habits. According to their subjective response regarding nutritional status, 49% of them said their nutritional status was fair during quarantine, followed by good was 40%. Only 9% of them coated it was poor.

The total IES-R score of ≥ 37 was found in all the PGs, but the severity was more in final year PGs. ≥ 24 IES-R score was observed more in first year PGs. A significant difference was found between the study year of their professional years at $P=0.028$. The overall mean IES-R subscales observed in our study for the intrusion scale was (6.8 ± 6.4) . Avoidance scale (6.9 ± 6.6) and hyperarousal scale was (4.2 ± 5) . An analysis of impact event scale of PTDS shows, overall mean range of the IES-R subscale was 19.2 ± 20.2 among male PGs, and in females, it was 16.8 ± 14.8 . No significant difference was found between male & female. Similarly, there was no difference in IES-R subscales scores between the genders (Table 1).

A statistically significant difference was observed between the different years of their year of the profession related to the IES-R subscale. The significant difference was observed with regards to the avoidance subscale at $P=0.034$ and $P=0.024$ for the hyperarousal subscale between the professional years.

The IES-R score severity of symptoms was observed more in the subject of primary contact compare to secondary contacts. But no statistical difference between subjects of primary and secondary contacts for the overall IES-R subscale (Table 2).

Overall IES-R score level was found more among those who are staying away from family but no statistically significant difference between staying with family or not with regards to overall both IES-R subscale and also for IESC-R score.

Only 5% of them have mentioned they need counseling to overcome the situation in the present study and counseling facilities were provided to all of them by expert opinion.

Table 1 — Distribution of postgraduates according to IES-R score and subscale score by Gender and PG Year

	Males	Females	p-value
IES- R SCALE N(%) by Gender :			
Nil	3(8.1)	10(23.3)	
Mild (≥ 24)	23(62.2)	19(44.2)	
Moderate (≥ 33)	6(16.2)	10(23.3)	
Severe (≥ 37 & above)	5(13.5)	4(9.3)	0.184
Subscales (Mean \pm SD) by Gender :			
The Intrusion subscale	7.1 \pm 7.4	6.6 \pm 5.6	0.744
The Avoidance subscale	7.7 \pm 7.3	6.3 \pm 5.9	0.33
The Hyperarousal subscale	4.4 \pm 6.0	4.0 \pm 4.0	0.69
IES- R SCALE N(%) by PG Year			
Nil	4(10.8)	7(26.9)	2(11.8)
Mild (≥ 24)	23(62.2)	10(38.5)	9(52.9)
Moderate (≥ 33)	7(18.9)	8(30.8)	1(5.9)
Severe (≥ 37 & above)	3(8.1)	1(3.8)	5(29.4)
Subscales (Mean \pm SD) by PG Year :			
The Intrusion subscale	6.4 \pm 5.4	5.3 \pm 5.1	9.9 \pm 9.2
The Avoidance subscale	6.6 \pm 5.2	5.1 \pm 5.3	10.4 \pm 9.5
The Hyperarousal subscale	3.5 \pm 3.7	3.2 \pm 3.7	7.1 \pm 7.8
Note: * significant at 5% level of significance ($p<0.05$)			

Table 2 — Comparison of Mean IES-R Scale and Subscale with Subject to Primary & Secondary Contact

IES- R SCALE N(%)	Nill (NA)	Primary contact	Secondary Contact	p-value
Nil	7(20.6)	3(15.8)	3(11.1)	
Mild (≥ 24)	17(50)	11(57.9)	14(51.9)	
Moderate (≥ 33)	7(20.6)	2(10.5)	7(25.9)	
Severe (≥ 37 & above)	3(8.8)	3(15.8)	3(11.1)	0.828
Subscales (Mean \pm SD)				
The Intrusion subscale	6.4 \pm 6.6	6.6 \pm 7.3	7.6 \pm 5.8	0.748
The Avoidance subscale	6.2 \pm 6.1	8.2 \pm 8.3	6.9 \pm 5.9	0.600
The Hyperarousal subscale	3.4 \pm 4.2	5.6 \pm 7.2	4.1 \pm 4	0.322

DISCUSSION

The literature related to the impact of COVID -19 was available only a few of the affected countries, presently there are not many studies have published in the literature on how severe the impact of COVID-19 pandemic is on mental health¹⁵. As much of the available data were not present for the novel coronavirus, many of the cross-references were taken from SARS & MERS. Because Studies conducted on the psychological impact of previous infectious outbreaks, the Severe Acute Respiratory Syndrome (SARS) was similar to the COVID-19 pandemic¹⁶.

The present study shows that the event of a major disaster of 2020, the so-called COVID-19 pandemic

has definitely made changes in mental health conditions among postgraduates (PGs) working at a Tertiary Care Hospital at selected Medical College.

A total of 84% of the PGs had one or the other symptoms of psychological in the present study. The severity range from mild to severe according to the IES-R score. The study was done by Lai J et al¹⁷ found a significant proportion of participants experienced anxiety, depression, and insomnia symptoms, and more than 70% reported psychological distress, similarly Chua SE et al¹⁸. In his study during the acute SARS outbreak, 89% of health care workers who were in high-risk situations reported psychological symptoms.

In this study, the mean score of IES-R was 17.9 ± 17.5 . there was no difference IES-R score between gender, similar results were observed in the study conducted by Zhang Y et al¹⁹ shows there was no difference in mean IES scores between females and males (14.2 versus 12.8 , respectively) ($P = 0.173$). This could be due to the fact that infectious disease outbreaks are known to have a psychological impact on healthcare workers as well as the general population and everyone has experienced the same impact of the outbreak in their life.

The overall mean IES-r subscales observed in our study for the intrusion scale was (6.8 ± 6.4). Avoidance scale (6.9 ± 6.6) and hyperarousal scale was (4.2 ± 5). The study conducted by Lee, Sang Min et al,²⁰ in his first survey, studied on healthcare workers who performed MERS-related tasks had significantly higher total IES-R scores and subscore which was higher than the present study. Similarly, a study conducted by Chew et al²¹ observed IES-R and subscore lesser than our study. The difference could be due to the study participants were apart from doctors other health workers were also involved in other studies.

The finding of the present study shows IES-R score severity of symptoms was observed more in primary contact PGs compare to secondary contacts. Report of other studies also shows a high prevalence of symptoms of psychological distress and disorder among hospital staff during the initial period of quarantine²². Severity was more during quarantine period because Quarantine is often an unpleasant experience for those who undergo it. Separation from loved ones, the loss of freedom, uncertainty over disease status, and boredom can sometime, create dramatic effect.

Analysis of our finding shows a Significant difference was found between different years of professionals the severity of IES-R score was observed more in final

year PGs. It could be due to the reason that they are the first to come in contact with patients and more experience for taking care of patients. But in another study, as such no difference of Work experience affected IES-score²³.

CONCLUSION AND RECOMMENDATIONS

Findings of the present study concludes that the COVID-19 pandemic was associated with the severe stressful impact on postgraduates working at tertiary care hospital, even though the COVID-19 pandemic is still ongoing. These findings would need to be verified in larger sample size and follow up of the study participants to see the effect symptoms of psychological disorders. Because PTSD will have a long term effect on the individual, it may sometimes persist or vanish after a long period.

Based on the finding of the resulting counseling is required for everyone. Especially to those whose IES-r score was more. Institute has made provision for Psychosocial cells to approach a subject expert for counseling. Toll-free number (24x7) and personal contact numbers are displayed at the hospital so that they can contact at any time.

Limitations of the study :

The study was conducted during the initial phase of the incidence of COVID-19 pandemic, so need a follow-up study to see the persistence of the impact of PTSD among PGs. Also, the sample size was less, therefore, we can't generalize the statement.

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Conflict of Interest : None

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“A mind all logic is like a knife all blade. It makes the hand bleed that uses it.”

— Rabindranath Tagore

Quotations courtesy : Dr C S Rajan, Bangalore

Original Article

Research Innovation for Osteoarthritis Knee by Adipose Derived Stromal Vascular Factor with Platelet Rich Plasma

Bhaskar Vyas¹, Pradip Mehta², Rajni B Vyas³, Palak Waghela⁴, Anant Marathe⁵

Purpose : The study aims to innovate the potential of Adipose derived Mesenchymal Stem Cells to chondrogenic translation so as to establish a less invasive, affordable alternative to knee replacement.

Background : Adipose tissue derived Stromal vascular fraction (AD-SVF) is heterogeneous mixture of different cell population. SVF possesses potential to translate into osteogenic and chondrogenic lineages. We designed a study to assess safety and efficacy of AD-SVF in 33 patients (for treating 66 knees) having osteoarthritis.

Basic Procedure : Patients were selected based on selection criteria. Lipoaspiration from the lower abdomen was done. The lipoaspirate was processed to obtain SVF. The intra-articular injection of SVF and Platelet-Rich Plasma (PRP) was given. Clinical outcomes were assessed with WOMAC and KSS scores at the interval of 1, 6 and 12 months. Pre and post MRI studies were done.

Main Findings : The safety of AD-SVF was confirmed as there were no adverse reactions. Patients exhibited rapid and progressive improvement of WOMAC & KSS Score by 12 months. For MRI studies, 1.5 tesla machine was deployed. This machine was insufficient to demonstrate new cartilage formation.

Implications : Our data demonstrates that AD-SVF therapy in combination with PRP is a safe and valid alternative treatment for knee osteoarthritis in 33 patients (66 knees). The intervention is simple, minimally invasive, requires minimal hospitalization and surgery; provides relief of pain and stiffness and improves physical functioning.

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Key words : Osteoarthritis knee, Adipose derived Stromal Vascular Fraction, Stem cell therapy, Regenerative medicine.

In 9.6% of men and 18% of women aged more than 60 years have symptomatic osteoarthritis¹. Osteoarthritis (OA) of the knee is now commonly treated surgically with total knee replacement when conservative management fails. Cartilage has limited self-renewal ability. This requires hospitalization, major surgery, that may need blood transfusion, has risk of infection and the treatment is expensive. Hence there is a need for development of alternate therapeutic modalities which are less-invasive and less expensive.

Stem cell technology is rapidly developing as a tool for regenerative medicine. Mesenchymal Stem cells [MSCs] possess numerous properties like anti-apoptosis, angiogenesis, growth factor production, anti-fibrosis, anti-inflammatory, immuno protection and chemo-atraction; in addition to translation to

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Editor's Comment :

- Article is original research in Indian Innovation.
- There is substantial clinical evidence for ADSVF application to be considered as a substitute for joint replacement for osteoarthritis knee.

chondrocytes. Numerous preclinical trials have shown promising results in osteoarthritis using SVF in various animal models²⁻⁴.

SVF isolated from human subcutaneous adipose tissue is an extract representing a heterogeneous collection of cells. Its composition is Mesenchymal stem cells (30-40%) having chondrogenic potential^{5,6}, endothelial precursor cells, T regulatory cells, macrophages, smooth muscle cells, and pre-adipocytes. Cells other than ADMSCs having CD 34+ cells in SVF also support angiogenesis⁷.

Highly biologically active molecular substances obtained following the disintegration of platelets not only cause an immediate relief from pain but also potentiate the action of MSCs. The effect is immediate but is not long lasting and cannot regenerate the cartilage singularly. Therefore PRP was used in combination with SVF.

Autologous SVF was injected intra-articularly along with PRP to investigate safety & efficacy in 33 patients (66 knees) with Osteoarthritis.

MATERIAL AND METHODS

A pilot study of 6 patients was conducted with satisfactory results⁸. The pilot study was carried out between 2011- 2013 with prior approvals from Institutional Ethics Committee. The study was enrolled as a clinical trial CTRI No 2013/02/004619.

Regulatory Approvals :

Indian Council of Medical Research (ICMR) has issued several editions of guidelines regarding stem cell research and therapy. The latest edition was in 2017.

In April 2018, Govt. of India published a notification in the Gazette to clarify about Stem Cell therapeutics. Accordingly, products such as Stromal Vascular Factor derived from Adipose Tissue come under the category of minimal manipulation.

A pilot study of 6 patients was conducted and results are published, whereby both safety and efficacy were provided with a proof of concept. The research was submitted for funding by Biotechnology Industry Research Assistance Council (BIRAC), Department of Biotechnology, Government of India and technical expert committee headed by Prof G Padmanabhan granted approval for funding. The research was conducted at Department of Scientific and Industrial Research (DSIR) certified research laboratory by Total Potential Cells Pvt Ltd (TPCPL). Research underwent scrutiny by Ethics Committee registered with DCGI by TPCPL. Institutional Committee for Stem Cell Research and Therapy under the Chairmanship of Dr Ramesh Bhonde at TPCPL further scrutinized the research and granted its approval. This was forwarded to ICMR.

Biotechnology Ignition Grant Scheme (BIG) funding was received with a time-limit to complete the project by 18 months. No: BIRAC/CCAMP0130/BIG -03/13. DCGI was informed. Clinical trial was registered at Clinical Trial Registry of India by their no. CTRI No 2013/02/004619. DCGI and ICMR representatives visited TPCPL by invitation and verified documents concerning Institutional Ethics Committee and ICSCRT approval in 2017. They noted that there were no adverse side effects and there was proven efficacy within the specified time limit by BIRAC. BIRAC in 2018 published the research in their book "BIRAC Innovations : Propelling the Bio-Economy"

The pilot study was carried out between 2011 – 2013 with prior approvals from Institutional Ethics Committee. The study was enrolled as a clinical trial CTRI No 2013/02/004619.

Following clinical examination of 138 patients, 33 patients with osteoarthritis of both the knees were selected as per the Inclusive & Exclusive criteria. Follow up of clinical and radiological assessments were

done up to 18 months.

Clinical Assessment was done as follows :

Western Ontario and McMaster Universities Arthritis Index (WOMAC)Score :

Arthritis Index (WOMAC)Score : This index evaluates pain with 5 criteria, stiffness with 2 criteria and physical function with 17 criteria. The scores are summed for items in each subscale. The possible ranges are; pain=0-20, stiffness=0-8, physical function=0-68. The statistical decrease in the score will indicate improvement.

Knee Society Score (KSS) : In KSS pain parameter, range of motion, walking, and stairs climbing were assessed. The scoring for pain point was 0-50; range of motion is 105-120; walking 0-50; stairs climbing 0-50. The statistical increase in the score will indicate improvement.

Total 33 patients with radiological evidence for osteoarthritis of both knees, satisfying selection criteria are included. MRI details in additions to Loss of Cartilage in patients are described in Table 2.

The patients underwent blood investigations including complete blood count, blood sugar, blood urea, serum creatinine, SGPT, HIV (I and II) antibody test, hepatitis B & C, Prothrombin time, thyroid stimulating hormone estimation.

Surgical Protocol :

The surgical procedures for lipoaspiration and intra-articular injection into the knee joints were performed at Premdas Jalaram Hospital, Spandan Hospital Vadodara Gujarat India. 800 – 1000 cc of lipoaspirate was obtained from lower abdomen. Under expert hands, collection of such huge amounts of lipoaspirate was routinely done under local anaesthesia with sedation. Lipoaspirate was processed at Total Potential Cells (P) Ltd, a GMP Class V research lab, Department of Science & Industrial Research approved in-house lab.

Isolation of Stromal Vascular Fraction :

Adipose tissue was aspirated with specially designed aspiration cannulae, with diameter ranging from 3mm, 4mm, 5mm and 6mm under local anesthesia. Lipoaspirate, with uniform viscosity like honey, was collected from lower abdominal subcutaneous fat. The samples were transferred to a GMP class V laboratory for cell isolation.

The isolation of adipose tissue derived stromal vascular fraction (AD-SVF) was performed with density gradient centrifugation technique. ADSVF from lipoaspirate were isolated after digestion with 0.2 % collagenase were incubated in CO₂ Incubator at 37° C. Cells obtained were made into a pellet at 1500 g in centrifuge.

Standard Operating Procedure for obtaining Concentrated Platelet Rich Plasma (ConcPRP) :

Concentrated PRP is obtained from 25cc

autologous blood for 1 joint with centrifugation 3 times at 200 x g for 20 min, 100 x g for 10 min and 800 x g for 15min at room temperature.

After the first spin 3 distinct layers will be observed –

Bottom layer : Red blood cells (accounting for 50–80% of the total volume)

Middle layer : Very thin band of white blood cells – buffy coat

Top layer : Straw-colored PRP

After second spin, buffy coat will be well defined. Supernatant plasma will be pipetted out leaving buffy coat undisturbed.

After third spin, a pellet containing most of the platelets will be generated. Keeping ~2 cc, the remaining supernatant will be discarded. When the pellet is dissolved in ~2 cc, it will yield concentrated platelet rich plasma to be injected into the knee joint.

Characterization of ADMSCs :

SVF was characterised to flow Cytometry (Fig 1). (Toprani Labs, Vadodara and C-CAMP, Bangalore) Isolation, culture and characterization with immuno cytochemistry of MSCs were done. Characterization was performed with 4 positive markers and 3 negative markers (Figs 2 & 3).

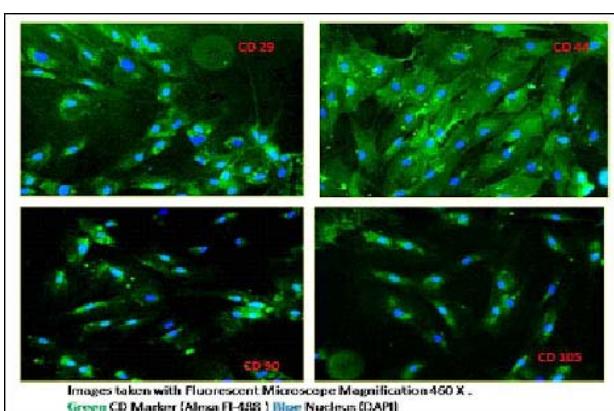


Fig 2 — Characterization of the ADMSCs (Positive markers)

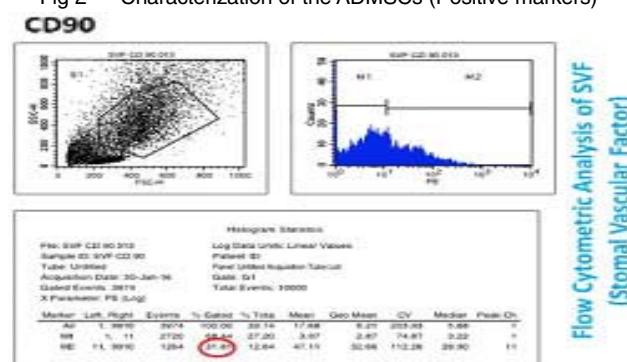


Fig 1 — Flow Cytometric Analysis of cell population in ADSVF: (a) Cells Positive for CD90 in Flow cytometric analysis of SVF CD90 n=31.81 – 39%, (b) Cells Positive for CD34 in Flow cytometric analysis of SVF CD34 n=12.58%

Statistical Analysis was done by Prism software (version 6). All data are expressed as mean \pm SD. Data was further analysed with ANOVA followed by Turkey's multiple comparison test for relevant inferences.

Proportion of AD-SVF & Concentrated PRP :

2cc of AD-SVF will be mixed with 3cc of Concentrated PRP to be injected into knee joint.

OBSERVATION

Sl No.	Sex (M/F)	Age (yrs)	Weight (kg)	Amount of lipoaspirate cells million	No of SVF cells
1.	F	58	55	250	110
2.	F	68	62	200	124
3.	M	79	59	270	118
4.	F	67	62	400	248
5.	M	63	60	470	237
6.	F	58	67	450	268
7.	F	45	75	700	250
8.	F	60	68	700	210
9.	F	56	104	800	322
10.	F	56	78	700	260
11.	F	77	46	400	209
12.	M	64	56	500	287
13.	M	67	82	480	189
14.	F	49	71	1000	240
15.	M	62	82	650	206
16.	F	61	57	800	390
17.	F	65	42	420	157
18.	M	72	63	550	254
19.	M	71	66	700	290
20.	F	56	64	470	253
21.	F	59	65	550	436
22.	F	62	63	525	230
23.	M	53	65	550	240
24.	F	61	85	600	279
25.	F	55	68	650	220
26.	M	60	87	700	579
27.	F	60	70	700	298
28.	M	56	70	600	329
29.	F	62	57	650	259
30.	F	66	71	800	264
31.	F	60	90	800	469
32.	M	76	68	600	224
33.	F	68	70	850	610

Flow Cytometric Analysis of SVF (Stromal Vascular Factor)

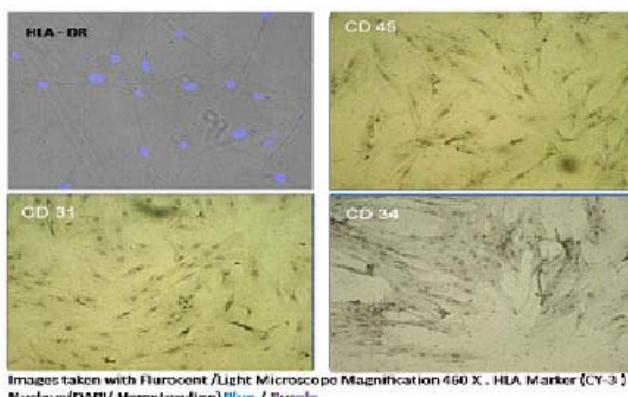


Fig 3 — Characterization of the ADMSCs (Negative markers)

Flow Cytometry Analysis : SVF in our samples contain 39% MSCs and 12.5% hematopoietic cells.

WOMAC Score :

Post Operative WOMAC Score of 66 knees before and after administration of SVF and PRP were as follows * $p<0.05$, ** $p<0.01$, *** $p<0.001$ for Pre vs Follow-up groups; # $p<0.05$, ## $p<0.01$, for comparison of 1month follow up vs 6 and 12 month follow up groups (Tables 1,2 & Figs 1,2).

The WOMAC score for right knee and left knee significantly ($P<0.001$) dropped with respect to pre treatment. In 31 of 33 the subjects, the score dropped at very first month and continued to improve till 12 months, 1 patient had prolapsed meniscus in the joint space and was advised excision. One patient was lost to follow up.

KS Score :

The increase in score indicates improvement. KS Score in 33 patients are shown in tabular representation. There was overall improvement in all the four criteria as per statistical analysis (Table 3).

KS Score of Osteoarthritis patients (total 66 knees) before and after administration of SVF and PRP * $p<0.05$, ** $p<0.01$, *** $p<0.001$ for Pre vs Follow-up groups; # $p<0.05$, ## $p<0.01$, for comparison of 1month follow up vs 6 and 12 month follow up groups.

One patient developed the symptoms of pain. He continued to do cycling for ~15 kms a day against the advice. On examination with MRI he was found to have prolapse of lateral and medial cartilage into the joint. This was removed with arthroscopy. Another patient required to be treated with a repetition of the same procedure after 17 months. He was walking ~7-8 kms a day and was repeatedly going up and down staircases upto 4th storey.

The physical therapy outcomes in

terms of range of motion, subjective pain, and functional status were all improved.

DISCUSSION

Present study confirms the cell population in Stromal vascular factor as reported by previously by Rada *et al*, 2010⁹ Preponderance of Mesenchymal stem cells in SVF derived from adipose tissue to the extent of 39% in our samples would have significantly contributed to better results than obtained from other sources.

MSCs exhibit different levels of osteogenic and chondrogenic differentiation properties. The regenerative property of SVF primarily depends on MSCs.

Nguyen *et al* 2016¹⁰ reported that autologous adipose derived SVF and PRP was injected to treat Osteoarthritis knee. Their study design was comparable to the present study. Nathan *et al* 2016¹¹,

Table 1 — Details of Lipoaspirate of the Patients undergoing treatment

MRI Findings In OA Patients	No of Knees
MMT = Medial Meniscus tear	26
LMT = Lateral Meniscus Tear	9
EMJ = Extrusion of meniscus joints	0
ACL = Anterior cruciate ligament	21
PCL = Posterior cruciate ligament	6
MCL = Medial Collateral Ligament	0
LCL = Lateral Collateral Ligament	0
CYST	16
OSTEO = Osteophytes	23
ISB = Infusion in suprapatellar bursa	22
SFTJ = Subluxation in femur-tibial joint	6
FB = Foreign bodies	4

Table 2 — The Western Ontario and McMaster Universities Arthritis Index (WOMAC) score in Osteoarthritis Patients Pre and Post treatment with Stem cells and PRP

	Pre	1 month	6 month	1 Year
Right Knee	67.84±13.21	42.75±20.54***	16.56±12.26***	9.09±9.49***
Left Knee	64.31±14.27	37.34±17.07***	15.13±13.45***	8.19±8.96***

Table 3 — The Knee Society Score in Osteoarthritis Patients Pre and Post treatment with Stem cells and PRP

Knee Society Score - Pain Point				
Right Knee	12.59±7.47	29.53±12.85***	38.13±8.59***	40.47±9.87***
Left Knee	14.38±7.16	32.97±10.99***	40.47±7.76***	42.19±10.16***
Knee Society Score - Range of Motion				
Right Knee	103.91±4.71	105.94±4.83	107.66±5.08	106.72±20.85
Left Knee	107.03±6.2	108.75±5.96	109.69±7.06	107.66±21.51
Knee Society Score - Walking				
Right Knee	21.88±11.48	30±8.42**	37.19±5.23***	36.88±8.59***
Left Knee	21.88±10.61	32.5±6.22***	37.5±4.4***	37.5±8.42***
Knee Society Score - Stairs Climbing				
Right Knee	25.31±10.92	35.47±8.74**	37.19±9.58***	37.5±10.78***
Left Knee	25.47±11.17	34.38±8.4**	38.13±8.96***	38.44±11.1***

reported 4 cases with autologous AD-SVF and PRP followed with subjective scoring of 12 months post therapy with favorable results. The present study reports 33 patients with age of 45-75 years, a larger group to assess safety and efficacy with internationally accepted WOMAC and KSS score for 12 months.

PRP has shown to contain 1507 protein based bioactive factors, Qureshi *et al*, 2009¹². These factors like TGF B and FGF2 help in formation of new cartilage¹³. Combination of PRP with MSCs in intra-articular injections increases collagen type II expression and reduces chondrocytes apoptosis as reported by Koh *et al*, 2013¹⁴.

Repair and regeneration of cartilage tissue in the meniscus is explained by Barry *et al*, 2013¹⁵. They concluded that adult mesenchymal stem cells stimulate the regeneration of meniscus tissue and delayed the progressive destruction of cartilage.

Huurne *et al*, 2012¹⁶ observed in C57BL6J mice where in ADMSCs thickened synovial lining and formation of associated ligaments and reduced destruction of ligaments. Favourable results in our study, even in patients with cruciate ligament rupture can be explained on this basis.

Favourable results in our study need to be buttressed further with (1) increasing the post-operative follow up with MRI studies with higher powered machine such as 7.5 Tesla (2) post treatment follow up with arthroscopic observation of the joint (3) follow up of the patient with longer duration, of 5 years.

We have shown that SVF along with PRP improved WOMAC as well as KSS score. We have observed improved score corresponding in OA patients without use of major invasive methods.

Limitations of the study :

The study has the following limitations:

(1) Translation of MSCs to chondrocytes/promoting chondrogenesis needs to be established with higher power of MRI machine and arthroscopy.

(2) The follow up of longer the 12 months is needed.

CONCLUSION

Intra-articular injections of autologous adipose SVF in combination with autologous PRP present a promising, minimally invasive option of treating OA knees.

ACKNOWLEDGEMENT

The M S University, Baroda has been incubator for the study. Manipal Institute of regenerative medicine, Bengaluru and Toparani Advance Lab, Vadodara for providing necessary facilities for Flow cytometry.

Research innovation is available in open domain. Approximate cost will be around Rs. 50,000.

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Original Article

Correlation between Her2Neu Status with Molecular Classification, Cyclin D1 Status and Ki67 Expression in Intraductal Carcinoma of the Breast

Sumita Bhattacharyya Panda¹, Sudipta Chakrabarti², Jayati Chakraborty³, Ranjan Bhattacharyya⁴

Introduction : With recent advancement of molecular biology, the prognosis and therapeutic strategy of breast tumours can be ascertained and predicted for a better prognosis.

Aims and objectives : The primary aim was to find out the correlation Her2Neu scoring and status with molecular classification of the breast. As the secondary outcome measure association will be looked for between Her2Neu status with Cyclin D1 and Ki67 expression in Invasive ductal carcinoma.

Material and Methods : The 57 cases with suspected breast carcinoma of intraductal carcinoma has been included in this study over a period of 18 months. Her2Neu expression and scoring done by Immunohistochemistry and Cyclin D1 expression was calculated semiquantitatively on the basis of positive nuclear staining fraction of tumour cells and their intensity. Ki67 expression has also been measured by IHC markers. The data analysed by SPSS version 25.0.

Results : The association between Her2Neu scoring ($p<0.001$) as well as Her2Neu status ($p<0.001$) have been found to be statistically significant. The association between Her2Neu scoring ($p=0.0359$) but not Her2Neu status ($p=0.2672$) with Cyclin D1 status has been found significant. The association between Her2Neu status and Ki67 status has been found to be significant ($p=0.004$).

Conclusion : The changes with increase in copy numbers and protein amplification of Her2, it has been shown the overexpression of this human epidermal growth factor receptor 2 is directly associated with early relapse, less survival time and poor prognosis.

[J Indian Med Assoc 2021; 119(4): 29-33]

Key words : Breast carcinoma, Her2Neu status, Molecular classification, Cyclin D1 status, Ki67 index, Immunohistochemistry

Breast cancer is most common in Indian women occurring in 1 in 4 women¹. Her2Neu oncoprotein (Human Epidermal Growth Factor receptor 2) also known as Neu CD 340 p 185, is a protein encoded by ERBB2 gene located in long arm chromosome 17q12 with tyrosine kinase activity. It was the first oncogene in the samples of Invasive Ductal Carcinoma (IDC) and seen in 10-20% of breast carcinoma patients. It is a marker for sensitivity to Herceptin (Trastuzumab)². The germline mutation (TP53 is commonly associated with breast cancers) seen in Li-Fraumeni syndrome. ER, PR, HER2 negative cancers (TN) or basal like cancers.

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Editor's Comment :

- The 57 cases with suspected breast carcinoma of intraductal carcinoma have been included in this study over a period of 18 months.
- The commonest type is Luminal A and the least common type is Her2positive type. The Luminal A type of tumours is commonly associated with Lobular carcinoma.
- The association between Her2Neu scoring ($p<0.001$) as well as Her2Neu status ($p<0.001$) have been found to be statistically significant.
- The association between Her2Neu scoring ($p=0.0359$) but not Her2Neu status ($p=0.2672$) with Cyclin D1 status has been found significant. The association between Her2Neu status and Ki67 status has been found to be significant ($p=0.004$).
- In this study, 40.4% patients had 3 Her2-Neu scoring, 90.9% patients had 3 Her2-Neu scoring, in LA Group 54.5% patients had 0 Her2-Neu scoring, in LB Group, 52.0% patients had 3 Her2-Neu scoring, in TN Group, 90.0% patients had 0 Her2-Neu scoring and the association of Her2-Neu scoring vs group was statistically significant ($p<0.0001$).

The response to chemotherapy is favourable with better prognosis in ER positive in HER2 negative breast cancers (24) Along with HER2, high Ki67 LI group of patients respond poorly to chemotherapy following

neoadjuvant endocrine therapy.³

The Molecular classification of breast carcinoma shows different hormonal receptors status and different immunohistochemistry (IHC) marker expression^{4,5}. The description of different molecular subtypes on the basis of this has been discussed below (Table 1, Fig 1).

The (ER/PR/HER2) expressions are key for molecular subtype classification. The expression of Her2neu2 in DCIS (Ductal carcinoma in situ) is extremely important to predict the local recurrence whereas LA and TN types have comparatively low risk of recurrence⁶.

MATERIALS AND METHODS

The primary aim of the presence study is to found the corelation between HER2Neu marker with other variables in invasive ductal carcinoma (IDC) of the breast) the secondary outcome results are corelation with other variables. The consecutive 57 samples over a period of 18 months have been included for the study. Written informed consent from the patients or their legal guardians has been taken. Patients who are attending Tertiary Medical College and have been diagnosed with breast carcinoma clinically have submitted either mastectomy /lumpectomy specimen to the department included in the study and after screening confirmed Intraductal carcinoma cases are being selected for analysis. The cases with presence of fixation artefact, other types of benign / malignant breast tumor besides invasive duct carcinoma,

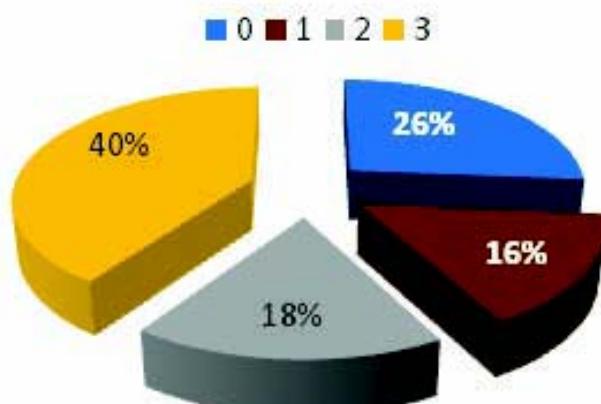


Fig 1

patients who have received any kind of chemotherapy, radiotherapy, homeopathic or ayurvedic treatment and the cases where the written informed consent couldn't be obtained were excluded from the study.

The correlation between Her2Neu scoring (0 to 3) and Her2Neu status (positive, negative and equivocal) with molecular classification, cyclin D1 status and Ki67are assessed. For statistical analysis data were entered and analysed by SPSS (Statistical Package for the Social Sciences) software (version 25.0; SPSS Inc, Chicago, IL, USA)⁷.

RESULTS

In our study, 15(26.3%) patients had 0 Her2-Neu scoring, 9(15.8%) patients had 1 Her2-Neu scoring, 10(17.5%) patients had 2 Her2-Neu scoring and 23(40.4%) patient had 3 Her2-Neu scoring. In HER2 Group, 1(9.1%) patients had 2 Her2-Neu scoring and 10 (90.9%) patients had 3 Her2-Neu scoring. In LA Group, 6(54.5%) patients had 0 Her2-Neu scoring and 5(45.5%) patients had 1 Her2-Neu scoring. In LB Group, 3(12.0%) patients had 1 Her2-Neu scoring, 9(36.0%) patients had 2 Her2-Neu scoring and 13(52.0%) patients had 3 Her2-Neu scoring. In TN Group, 9 (90.0%) patients had 0 Her2-Neu scoring and 1(10.0%) patient had 1 Her2-Neu scoring. The association of Her2-Neu scoring vs group was statistically significant ($p<0.0001$) (Table 2, Fig 2).

In HER2 Enriched Group, 10(90.9%) patients had 1 Her2 Status and 1(9.1%) patients had 3 Her2 Status. In LA Group, 11(100.0%) patients had 2 Her2 Status. In LB Group, 13(52.0%) patients had 1 Her2 Status, 5 (20.0%) patients had 2 Her2 Status and 7 (28.0%) patients had 3 Her2 Status. In TN Group, 10 (100.0%) patients had Her2 Status. The association of Her2 Status vs group was statistically significant ($p<0.0001$) (Table 3, Fig 3). In Grade-1 Group, 2(33.3%) patients had 0 Her2-Neu scoring, 1(16.7%) patient had 2 Her2-

Table 1 — Molecular Subtypes of Breast Carcinoma	
Molecular subtypes	Description
Luminal A	ER/PR positive, HER2 negative, low Ki67, low grade, slow growing seen in older patients and carries best prognosis.
Luminal B	ER/PR positive, either HER2 positive or negative with high Ki67, grow slightly faster has higher expression of gene proliferation carries worse prognosis than Luminal A subtype.
Triple Negative (TN) /basal like	ER/PR negative, HER 2 negative and more common in BRCA1 mutation.
HER2-enriched	ER/PR negative, HER 2 positive, grow faster, associated with nodal metastasis and have worse prognosis.
Basal like	Similar to Luminal A disease ER/PR positive, HER2 negative, low Ki67, seen in younger patients with visceral organ metastasis and has slightly poor prognosis than Luminal A disease.

Table 2 — Association between HER2-Neu scoring: Molecular Classification (Fig 5.20)						
Molecular Classification						
Her2-Neu scoring	HER2 n(%)	LA n(%)	LB n(%)	TN n(%)	TOTAL n(%)	
0	0(0.0%)	6(54.5%)	0(0.0%)	9(90.0%)	15(26.3%)	
1	0(0.0%)	5(45.5%)	3(12.0%)	1(10.0%)	9(15.8%)	
2	1(9.1%)	0(0.0%)	9(36.0%)	0(0.0%)	10(17.5%)	
3	10(90.9%)	0(0.0%)	13(52.0%)	0(0.0%)	23(40.4%)	
Total	11(100.0%)	11(100.0%)	25(100.0%)	10(100.0%)	57(100.0%)	

$\chi^2 = 61.7925$; p-value:<0.0001

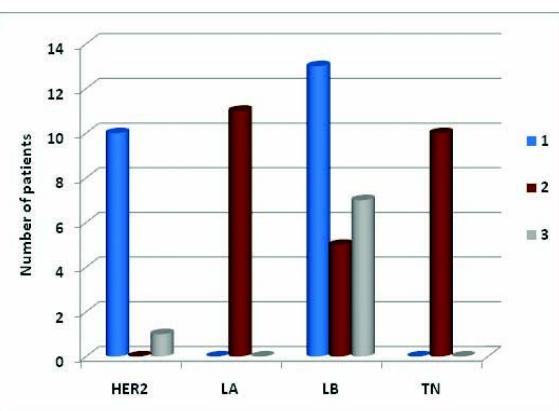


Fig 3

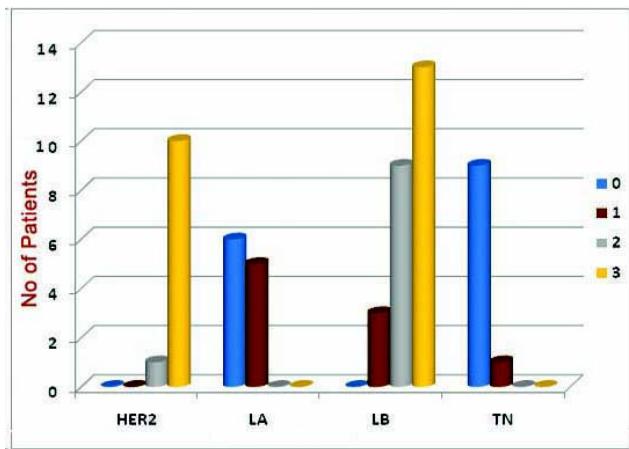


Fig 2

Table 3 — Association between Her2Neu Status : Molecular Classification (Fig 3)						
Molecular Classification						
Her2 Status	HER2 Enriched	LA	LB	TN	TOTAL	
Positive :						
n (%)	10(90.9%)	0(0.0%)	13(52.0%)	0(0.0%)	23(40.4%)	
Negative :						
Row Col (%)	0(0.0%)	11(100.0%)	5(20.0%)	10(100.0%)	26(45.6%)	
Equivocal :						
Row Col (%)	1(9.1%)	0(0.0%)	7(28.0%)	0(0.0%)	8(14.0%)	
Total :						
Row Col (%)	11(100.0%)	11(100.0%)	25(100.0%)	10(100.0%)	57(100.0%)	

$\chi^2 = 45.1262$; p-value:<0.0001

Neu scoring and 3(50.0%) patients had 3Her2-Neu scoring. In Grade-2 Group, 6(42.9%) patients had 0 Her2-Neu scoring, 3(21.4%) patients had 1 Her2-Neu scoring, 3(21.4%) patients had 2 Her2-Neu scoring and 2(14.3%) patients had 3Her2-Neu scoring. In Grade-3 Group, 1(25.0%) patient had 0 Her2-Neu scoring, 2(50.0%) patients had 2 Her2-Neu scoring and 1(25.0%) patient had 3 Her2-Neu scoring. In Grade-

4 Group, 4(16.0%) patients had 0 Her2-Neu scoring, 2 (8.0%) patients had 1 Her2-Neu scoring, 3(12.0%) patients had 2 Her2-Neu scoring and 16 (64.0%) patients had 3Her2-Neu scoring. In Grade-5 Group, 2(25.0%) patients had 0 Her2-Neu scoring, 4(50.0%) patients had 1 Her2-Neu scoring, 1(12.5%) patient had 2 Her2-Neu scoring and 1(12.5%) patient had 3Her2-Neu scoring. The association of Her2-Neu scoring vs group was statistically significant ($p=0.0359$). (Table 4, Fig 4) In Grade-1 Group, 3(50.0%) patients had 1 Her2 Status, 2 (33.3%) patients had 2 Her2 Status and 1(16.7%) patient had 3 Her2 Status. In Grade-2 Group, 2(14.3%) patients had 1 Her2 Status, 9(64.3%) patients had 2 Her2 Status and 3(21.4%) patients had 3 Her2 Status. In Grade-3 Group, 1(25.0%) patient had 1 Her2 Status, 2 (50.0%) patients had 2 Her2 Status and 1(25.0%) patient had 3 Her2 Status. In Grade-4 Group, 15(60.0%) patients had 1 Her2 Status, 8(32.0%) patients had 2 Her2 Status and 2(8.0%) patients had 3 Her2 Status. In Grade-5 Group, 2 (25.0%) patients had 1 Her2 Status, 5(62.5%) patients had 2 Her2 Status and 1(12.5%) patient had 3 Her2 Status. The association of Her2 Status with cyclin D1 status has not been found to be statistically significant ($p=0.2672$). (Table 5, Fig 5). In the 3 x 2 contingency table, Ki67 expression (high and low) with Her2Neus status (positive, negative and equivocal) status have been checked. The chi square test has been done (Table 6), It has been found that the chi-square statistic is 11.0083 and the p-value is 0.004 (Table 6).

DISCUSSION

Breast carcinoma has different clinical presentation, different behaviours and progression and existing histological classifications fall way short to correlate

Table 4 — Association between Her2-Neu scoring : Cyclin D1 Status (Fig 4)

Cyclin D1 Status	Her2-Neu scoring	Grade-1 n(%)	Grade-2 n(%)	Grade-3 n(%)	Grade-4 n(%)	Grade-5 n(%)	Total n(%)
0	2(33.3%)	6(42.9%)	1(25.0%)	4(16.0%)	2(25.0%)	15(26.3%)	
1	0(0.0%)	3(21.4%)	0(0.0%)	2(8.0%)	4(50.0%)	9(15.8%)	
2	1(16.7%)	3(21.4%)	2(50.0%)	3(12.0%)	1(12.5%)	10(17.5%)	
3	3(50.0%)	2(14.3%)	1(25.0%)	16(64.0%)	1(12.5%)	23(40.4%)	
Total		6(100.0%)	14(100.0%)	4(100.0%)	25(100.0%)	8(100.0%)	57(100.0%)

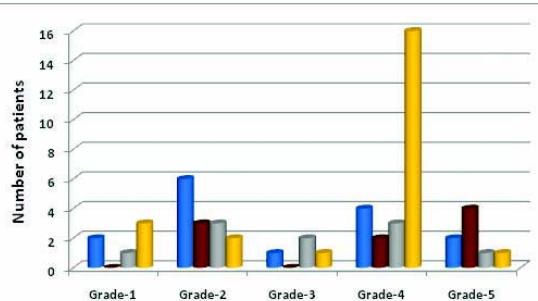
 $\chi^2 = 22.1492$; p-value:0.0359

Fig 4

less lymph node spread. It evolves slowly and with positive ER status shows favourable response to endocrine therapy^{8,9}. LA type B has intermediate prognosis with potential for local regional recurrence (LRR)^{10,11}.

They are often being treated with breast conservative surgery and radiotherapy and the risk of LRR is around 5%. The endocrine therapy reduces LRR and mortality rate by more than 50%. Her2 overexpression carries higher risk of LRR (4-15%). Breast carcinoma cells are more vulnerable to injury when the Her2 pathway is activated¹².

Her2 over expression is found in nearly all cases of comedo type DCIS in 20-30% of IDC and in smaller percentage of invasive lobular carcinoma. Her2 gene amplification in breast cancer is associated with tumour invasiveness, progressive regional and distant metastasis and adverse prognosis¹³.

The critical assessment with quantitative analysis has shown correlation between cyclin D1 and HER2 (Pearson's correlation = 0.90) and kappa correlation = 0.62). Cyclin D1 biomarker has also found to be inversely correlated to ER, PR HER2neu negative tumours. With growing public awareness, diagnostic facilities and availability biomarkers will guide the future management. Her2 positive cancers arise from the pathway which shows amplification of HER2 in which is located in chromosome 17q¹⁴.

In this study it has been found that both Her2Neu status and Her2Neu scoring are statistically significant ($p<0.001$) with molecular classification of IDC (Intraductal carcinoma of the breast) (Tables 2&3). The association of Her2-Neu scoring and cyclin D1 status (Table 4) has been found to be statistically significant ($p=0.0359$) however the same with Her2Neu status and cyclin D1 status (Table 5) are not found to be clinically

Cyclin D1 Status	Her2-Neu scoring	Grade-1 n(%)	Grade-2 n(%)	Grade-3 n(%)	Grade-4 n(%)	Grade-5 n(%)	Total n(%)
1	3(50.0%)	2(14.3%)	1(25.0%)	15(60.0%)	2(25.0%)	23(40.4%)	
2	2(33.3%)	9(64.3%)	2(50.0%)	8(32.0%)	5(62.5%)	26(45.6%)	
3	1(16.7%)	3(21.4%)	1(25.0%)	2(8.0%)	1(12.5%)	8(14.0%)	
Total		6(100.0%)	14(100.0%)	4(100.0%)	25(100.0%)	8(100.0%)	57(100.0%)

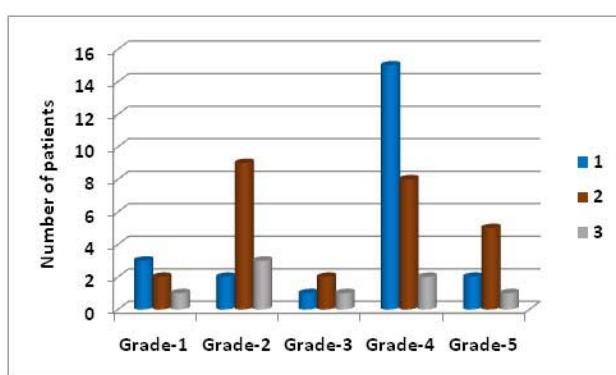
 $\chi^2 = 9.9694$; p-value:0.2672

Fig 5

the trajectory of progression and making clinical decision. The molecular classification of breast cancer cell lines used in scientific studies are done by surrogate panel of IHC markers.

LA subtype has very good prognosis and shows

Table 6 — Association between Her2Neu status and Ki67 expression

Variable	Ki67 high	Ki67 low	Row Total
Her2Neu Pos	22	1	23
Her2Neu Neg	14	12	26
Her2Neu Equiv	6	2	8
Column Total	42	15	57 (Grand Total)

 $\chi^2 = 11.0083$; p-value:0.004

significant ($p=0.2672$). The association between Her2Neu status and Ki67 expression (Table 6) has emerged up as statistically significant ($p=0.00407$).

Conclusion :

Immunohistochemistry may be used to subclassify the different breast tumours. The commonest type is Luminal A and least common type is Her2positive type. The Luminal A type of tumours are commonly associated with Lobular carcinoma. On the other hand Her2positive and TN (triple negative) groups show higher tumour grade and larger size when initially diagnosed usually in middle age group. The present study has some limitations like other varieties of invasive breast carcinoma like lobular carcinoma, metaplastic, medullary carcinoma have not been studied. A follow up longitudinal study with higher sample size and more biomarkers will be helpful to extrapolate the findings of present study. Despite these limitations, the present study is generates significant outcome which will be helpful for future research and will add scientific values with current knowledge.

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Conflicts of interest : None.

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Review Article

Transient Loss of Consciousness (TLOC) — A Low-risk High Stakes Condition that Every Physician Must Know How to Manage

Gautamananda Ray¹, Iain Keith²

Transient loss of consciousness also known as TLoC is a common reason for presentation in the Emergency Department and in General Practice and accounts for 3-5% of Emergency Department presentations. The incidence sharply increases with age. Finding the underlying cause after a single episode can be challenging particularly as patients recover fully by the time they are brought to medical attention. A systematic assessment including a detailed history from the patient and a witness are extremely important. A detailed clinical examination and a judicious use of investigations are key to the management of this low risk but high stakes condition. There are a number of risk stratification tools and scores that can be used to aid in identifying those at high risk of death and needing further investigation and treatment. Some patients presenting with TLoC are unnecessarily investigated and in as many as half of the cases the diagnosis of the underlying aetiology remains unclear despite multiple investigations. It is important that clinicians assessing patients with TLoC are aware of the driving regulations as guided by the DVLA in UK and provide these patients with appropriate advice while they get investigated.

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Key words : Transient Loss of Consciousness, TLoC, Syncope, Risk Stratification.

Transient Loss of Consciousness (TLoC) is defined as an abrupt loss of consciousness of short duration that is followed by a spontaneous and complete recovery. Almost half of the patients in UK do not get a diagnosis for an underlying cause and the burden on the NHS with the costs of investigations are very high¹. Patients often describe episodes of TLoC as "Blackout" or "Collapse" but some people can have collapses without any loss of consciousness and should not typically be described as TLoC. Up to 6% of emergency admissions in hospital and 3-5% of Emergency Department presentations can be due to TLoC². It is particularly common in patients over the age of 65 years and in this group syncope and seizure are most common.

The diagnosis of the underlying cause of TLoC can be challenging to physicians and can result in delay in correct diagnosis and effective treatment. For example, a patient with a cardiovascular cause for TLoC may be treated for epilepsy for several years before it

Editor's Comment :

- An important cause of TLoC in the elderly is orthostatic hypotension secondary to prescribed medications.
- Cardiological causes are more common than neurological causes of TLoC and carries a high risk of death.
- Use of risk stratification scores like the Canadian Syncope Risk Score, FAINT Score, OESIL Score or the San Francisco Rule can be useful to determine those who need hospital admission or at risk of death.
- ECG is mandatory for almost all patients with syncope to look for cardiac causes.
- Any patient with murmur with syncope needs echocardiography
- All patients in UK must be given driving advice as per the DVLA recommendations.

is identified correctly. Sometimes patients can end up having several inappropriate tests and are referred to the wrong specialty resulting in wastage of valuable healthcare resource and patient dissatisfaction. Sometimes delay in diagnosing significant and dangerous cardiac dysrhythmias may result in death and severe morbidities and long-term disabilities.

Classification :

There are two main groups of TLOCS – TLOC due to head trauma and TLOC due to non-traumatic causes. This review will cover the non-traumatic causes of TLOC and will henceforth be referred as TLOC. There are four major causes for non-traumatic TLOC and in order of their frequency are (1) Syncope, (2) Epileptic Seizures (3) Psychogenic and (4) Other Rare causes (Fig 1). Sometimes the term pre syncope or faint is

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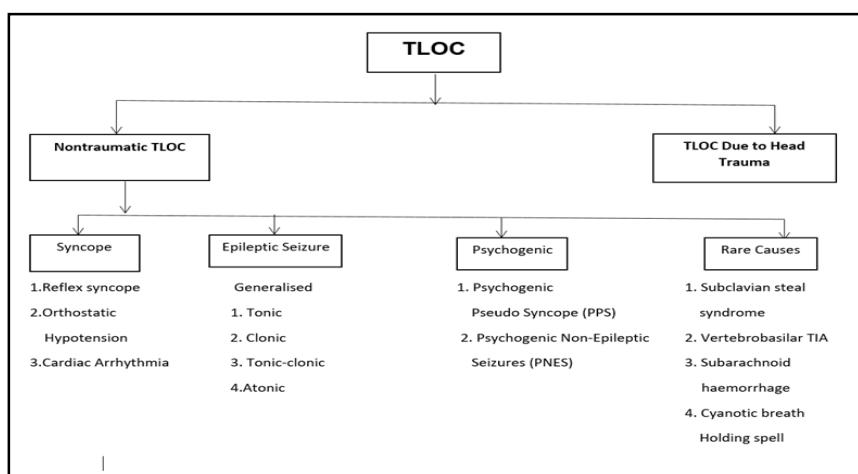


Fig 1 — Classification of TLoC according to the underlying cause

used to describe the prodrome where there is no loss of consciousness. The Framingham study found that 30 % of patients with syncope has more than one episode but the diagnosis of TLoC when patients present for the first time can be challenging.

Pathophysiology:

The major headings under which the causes of TLOC are classified in Fig 1 is based on the pathophysiology of each. The underlying mechanism for (a)syncope is cerebral hypoperfusion (b) epileptic seizures is excessive brain activity and (c) psychogenic causes is the process of conversion. Syncope occurs because of a global decrease in blood flow in the brain. A sudden reduction of cerebra blood flow for as short as 6-8 seconds can cause syncope. In upright position a systolic BP of 50-60 mmHg at heart level or 30–45 mmHg at brain level will cause syncope^{4,5}. Of the different causes of TLoC 92 % are due to syncope while 6% are due to non-syncope causes. In about 2% cases the cause of TLoC is unknown. Syncope can be "neurally mediated" and include vasovagal episodes, carotid sinus hypersensitivity and situational syncope. In neurally mediated syncope there is triggering of a "reflex response" that causes sudden vasodilatation and bradycardia either alone or in combination. In vasovagal syncope often the trigger can be emotional stress or due to prolonged standing in a closed place. In carotid sinus hypersensitivity the symptoms can be reproduced sometimes by manipulation and massaging the carotid sinuses that can elicit a vasodepressor response. The situational syncope includes physiological activities like micturition, cough, defaecation or swallowing. Sometimes it may be

difficult to elicit the trigger and hence history taking is extremely important in TLoC. Orthostatic Hypotension causing syncope is most commonly drug induced (especially in the elderly) but can also occur due to autonomic failures (both primary and secondary) or due to volume depletion. The typical history of a positional syncope of orthostatic hypotension is syncope while standing up from lying or sitting postures and the final pathway is the failure of the autonomic nervous system to changes in the posture. Cardiac arrhythmias cause a fall

in the cardiac output and results in cerebral hypoperfusion. They are a common reason for emergency hospital admission and death and includes both brady and tachyarrhythmias. Common brady arrhythmia include sick sinus syndrome, advanced AV blocks. While common tachyarrhythmias include both ventricular and supraventricular tachyarrhythmias. Inherited long QT syndromes like Brugada Syndrome (Fig 2) and implanted devices like ICD and Pacemaker malfunction can sometimes cause syncope. Structural diseases of the heart and lung cause syncope due to cerebral hypoperfusion where the diseased heart and lung cannot cope with the increased demands put on them and commonly occurs during exercise. In this group, hypertrophic obstructive cardiomyopathy (HOCM), severe aortic stenosis, myocardial infarction and severe pulmonary hypertension can cause syncope



Fig 2 — Typical ECG of a patient with Brugada Syndrome (characterised by coved >2mm ST elevation in V1-V3) that can cause syncope or sudden cardiac death in someone with a structurally normal heart

and sudden death in a small number of cases. Rare causes include Steal Syndromes where blood is diverted away from the brain because of obstruction of blood vessels (example subclavian steal syndrome).

In Non-Syncopal causes of TLoC the mechanism is not due to cerebral hypoperfusion but because of other reasons like increased electrical activity in the brain or breach in the physiological neural pathways. Common non syncopal causes for TLoC are epilepsy, metabolic causes like hypoglycaemia or hypoxia, intoxications with drugs or alcohol, psychogenic, drop attacks, vertebrobasilar Transient Ischemic Attack (TIA) and falls⁶.

Presentation :

Patients may present to their general practice or in the emergency department after a fall and or injury, they may have sustained trauma secondary to the fall and other accident and the prodrome of the fall may be forgotten. Mechanical falls should be the last diagnosis thought of especially in the elderly population presenting with TLoC.

Investigation :

A clear and complete history should be taken including past medical and family history with any recent medication changes. If possible collateral history and eyewitness of the event can be invaluable including paramedic information sheets. Special attentions should be taken to elicit the prodrome and postdrome of the event. Posture and activities before the index episode can point in the direction of postural and reflex cause of symptoms (for example sitting to standing, micturition or defecating). It should be noted that it can take up to three minutes for the systolic pressure to drop in orthostatic hypotension. One should ask the questions – (a) has there been a history of palpitations to suggest an arrhythmia? (b) was the pallor to suggest hypotension and or cardiac cause? Myoclonic jerks and incontinence are not a reliable sign of an epileptic event as this can occur with reflex syncope⁷. In recovery if there is a period of prolonged confusion and or postictal state with tongue biting this may well suggest an epileptic cause.

Facial injuries sustained to the patient are strong suggestions of loss of consciousness while claims of multiple falls and syncope with no apparent injuries may suggest a psychogenic cause. This can be collaborated by the witnesses of the syncope or seizure.

Capillary Blood Glucose : Is an important investigation in the Emergency Department for anyone with a transient loss of consciousness though it is

unlikely that they would fully recover without any glucose given to the patient during or after episode.

ECG : All patients should have an ECG and if this is normal then there is a low risk of serious cardiac cause for the TLoC. Heart block and bradycardias all require admission to further investigate. Non sustained tachyarrhythmias such as Atrial Fibrillation may only require rate control and a short period of observation before discharge.

Lying and standing blood pressure⁸ : This should be performed at 0, 1 and 3 minutes when erect to ensure that a delayed hypotensive event has not occurred.

Bloods : Full blood count and or urea and Electrolytes to rule out biochemical causes of an arrhythmia such as hypokalaemia and other rule out tests such as a D-dimer if a pulmonary embolus is suspected.

Echocardiography : If there is a history of syncope post or during exercise then an echocardiogram and exercise tolerance test specifically looking for a left ventricular outflow tract obstruction (Fig 3) and or arrhythmia should be sought.

Cardiac Monitoring : A history of palpitations may require cardiac monitoring and if their ECG is normal and depending on the frequency of attacks 48 hours to 7-day Holter monitoring may be required. If there are still episodes of TLOC and a cardiac cause is suspected then implantable loop recorder⁹ can help in the diagnostic pick up of cases.

Management :

The management of a patients with TLoC can be challenging because by the time they see a clinician they have fully recovered. The job of the Emergency Physician or the General Practitioner is to discharge those who are low risk and at the same time identify



Fig 3 — Echocardiogram of a patient with Hypertrophic Obstructive Cardiomyopathy with Dynamic Left Ventricular Outflow Tract (LVOT) obstruction

those who are high risk and need further investigations and hospital admission. The management of TLOC greatly depends on the cause of loss of consciousness, with specific management depending on the cause (Fig 4).

Tachyarrhythmias may require rate limiting drugs while heart blocks and significant pauses (greater than 3 seconds) in ECG will require pacemaker insertion⁹.

Orthostatic hypotension may require medication review and consideration of altering the drugs depending on the utility of each medication and the risk of harm with further collapses e.g. the treatment of hypertension and cardiovascular risk vs syncope and falls. Fluid loading can help with some cases with the addition of fludrocortisone in selected cases¹⁰.

Driving :

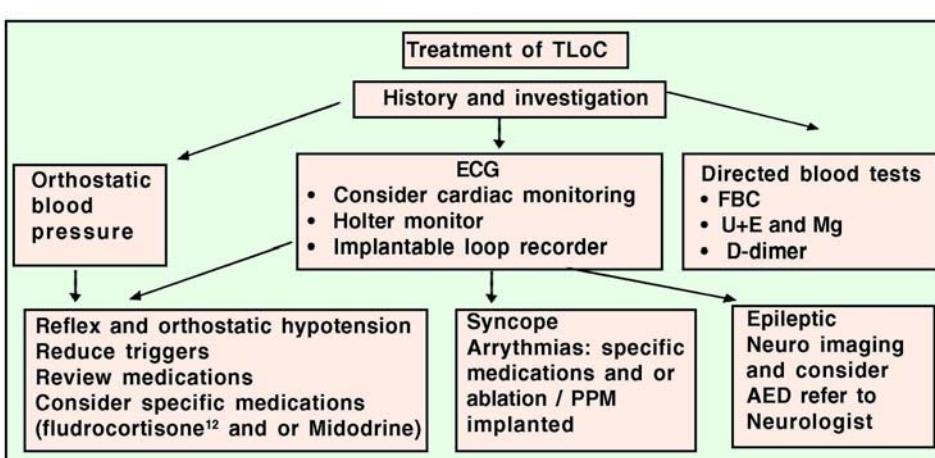
Depending on the diagnosis and the risk of occurrence the patient may have to suspend driving and inform their licensing body. In the UK there are clear guidelines published (by the DVLA) and accordingly advice can be given to the patient¹¹. If the patient drives, failure to warn the patient to stop driving, may cause harm to themselves or the public if there is an episode of syncope or seizure while operating a vehicle.

Risk Stratification Tools : There are a number of risk stratification scores like the Canadian Syncope Risk Score (for patients >16 years)(Fig 5)¹⁴, the FAINT Score for patients >65 years¹⁵, the San Francisco Rule¹⁶ and the OESIL Score¹⁷. All give validated relative risk and guidance for TLOC and can guide the safety of discharge from the General Practitioners Clinic or Emergency Department.

The National Institute for Health and Care Excellence (NICE) Guidelines¹³ recommend that patients with TLoC who present in the Emergency

Category	Points	
Clinical evaluation		
Predisposition to vasovagal symptoms*	-1	
History of heart disease†	1	
Any systolic pressure reading < 90 or > 180 mm Hg‡	2	
Investigations		
Elevated troponin level (> 99th percentile of normal population)	2	
Abnormal QRS axis (< -30° or > 100°)	1	
QRS duration > 130 ms	1	
Corrected QT interval > 480 ms	2	
Diagnosis in emergency department		
Vasovagal syncope	-2	
Cardiac syncope	2	
Total score (-3 to 11)		
	—	
Total score	Estimated risk of serious adverse event,§ %	Risk category
-3	0.4	Very Low
-2	0.7	Very Low
-1	1.2	Low
0	1.9	Low
1	3.1	Medium
2	5.1	Medium
3	8.1	Medium
4	12.9	High
5	19.7	High
6	28.9	Very High
7	40.3	Very High
8	52.8	Very High
9	65.0	Very High
10	75.5	Very High
11	83.6	Very High

Fig 5 — Canadian Syncope Risk Score¹⁴



Department will need referral for further investigations if they have any one of the following:

- An abnormal ECG
- TLOC during exercise
- Family history of sudden death (in a person <40 years old or an inherited cardiac condition)
- New or unexplained breathlessness
- Heart murmur

Fig 4 — Flowchart of the management of TLoC (FBC – Full Blood Count, U+E – Urea and Electrolytes Mg – Magnesium and AED- Anti Epileptic Drugs)

CONCLUSION

TLoC is a common presentation in both hospitals and in general practice and is a low-risk condition in most cases though high stakes in some patients that may result in death. It is vital that the physicians are able to risk stratify and differentiate the serious causes of TLoC from the non-serious causes and start appropriate investigations as early as possible to reduce both mortality and morbidity that comes with it but also avoid unnecessary investigations. Use of risk stratification tools like the different risk calculators can be valuable aid on top of the clinical judgement in this regard. It is also vital that patients presenting with TLoC are given appropriate advice on driving to protect the patient and the public from harm.

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Review Article

Managing Asthma : Must Know Areas for General Physicians

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Asthma is fast emerging as a major public health problem of India. The incidence of Asthma is increasing, so is our knowledge. Out of various guidelines available to manage asthma, that of Global Initiative for Asthma (GINA) is most commonly followed and recommended by practicing physicians. It is updated regularly. But still asthma is sub optimally treated. Most of the death of asthma can be prevented if asthma is treated as per guidelines. Knowledge of the pathogenesis, drugs and proper use of them can help in the long term goals of asthma management of risk reduction and symptom control. Inhalation therapy is the cornerstone of management of asthma. Drugs are available to manage different stages of the disease. Proper use of inhalers makes huge difference in the control of symptoms. Most cases of probable asthma come first to the general physicians or family physicians. These doctors should have basic understanding of pathophysiology and diagnostic criteria of asthma. They should familiarise themselves with latest guidelines and should have knowledge of giving right therapy at the particular stage of asthma. Right drugs at the right time to right patient is the only right way to manage asthma rightly. In this article we have highlighted the pharmacotherapy and step wise management of asthma that a general physician should know.

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Key words : Asthma, GINA, Guidelines, Corticosteroids.

Definition of asthma as per the Global Initiative for Asthma (GINA) guidelines involves two components: history of any of the characteristic symptoms – wheeze, shortness of breath (breathlessness), chest tightness or cough, and evidence of variable airflow limitation – based on bronchodilator reversibility testing using spirometry or peak flow meter or other tests. Hence, use of spirometry or peak flow meter is essential to make a reliable diagnosis of asthma¹. Like most chronic diseases, asthma is not curable and so it is justified to have the goals of asthma management. The long-term goals of asthma management are risk reduction and symptom control.

There are around 300 million patients of Asthma worldwide. This number is estimated to increase by another 100 million by 2025. It is estimated that asthma accounts for about 1 death in every 250 deaths across the world. Most of these deaths are preventable, being due to suboptimal long-term medical care and delay in obtaining help during the final attack. Clinical asthma prevalence is 4.5% of total world's population. However,

Editor's Comment :

- Asthma Management is not only about writing a prescription and giving to the patient.
- It is a process more of developing a patient- doctor partnership.
- Inflammation in the airway mucosa is the main cause of symptoms and with regular medication with inhaled corticosteroids hyperreactivity of the airways decreases and subsides.
- Step care management of Asthma as per guidelines achieves the long-term goals of asthma management which are risk reduction and symptom control.
- In addition to selection of medication as per guidelines care should be taken for adherence to the therapy, technique of using the inhaler and the device, avoidance of environmental trigger factors, and identification and treatment of any comorbidities.

8.6% patients suffer from asthma across the world based on self-reported prevalence. This means around 623 million people around the world are currently living with some level of Asthma symptom².

Symptom Control and Good Quality of Life :

Patients should have a good control of symptoms and should not get recurrent episodes of cough or breathlessness. Ideally, the patient should have:

1. No asthma exacerbations
2. Good symptom control (minimal episodes of cough, breathlessness and wheeze)
3. No dietary restrictions
4. No activity restriction
5. No loss of work or school
6. No night-time awakenings: Asthma symptoms

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are more during the night-time and cause sleepless nights, sometimes for the entire family. This can easily be stopped with proper control.

Minimizing Risks due to Disease and Management :

Asthma can exacerbate in anybody. Asthma exacerbation can cause suffering to individuals and progressive damage to the airways. It also imposes a huge psycho-socio-economic burden on the family. Long standing uncontrolled Asthma can lead to airways remodelling and permanent changes in the airways. This may lead to the patient developing fixed airways obstruction and Chronic Obstructive Pulmonary Disease (COPD) phenotype in future. These can be prevented with regular controller therapy to control the inflammation. A lot of medications both oral and inhalation are used to manage asthma. These all have some side effects. Adverse reactions are less with inhaled medications. Side effects of oral steroids can and must be avoided by using inhaled corticosteroids. Unfortunately, patients of asthma are happy with the little control they get from the medicines, objectively they are either uncontrolled or poorly controlled.

Pharmacotherapy of Asthma :

Medications required for management of asthma are classified into three groups:

1. **Controllers** : Include Inhaled corticosteroids, Long Acting Beta 2 Agonists (LABA), Anti leukotrienes

2. **Relievers** : Short acting Beta 2 Agonists (SABA, Salbutamol) as well as short acting Anti Muscarinics (Ipratropium)

3. **Add on therapy** : These are drugs required only in severe cases where standard therapy does not work.

Inhaled Corticosteroids :

Corticosteroids have a broad-spectrum anti-inflammatory effect in asthma³. Corticosteroids primarily act on the structural cells of the airways, mainly the epithelial cells. It also acts on the smooth muscle cells, the vascular endothelium and the fibroblasts. In these cells, corticosteroids act by suppressing the activation of the inflammatory gene transcription which is responsible for increased expression of multiple inflammatory proteins including cytokines, chemokines, adhesion molecules, inflammatory enzymes and receptors. Thus, at a cellular level, they reduce the number of inflammatory cells in the airways including eosinophils, Tlymphocytes, mast cells and dendritic cells. They also inhibit the survival of these cells in the airways. Corticosteroids also increases the expression of beta-2 adrenergic receptors in the lung and prevent their

down regulation and uncoupling in response to beta - 2 agonists. Table 1 shows the recommended dosage of common inhaled corticosteroids used in the management of asthma.

Short Acting and Long Acting Beta 2 Agonists :

$\beta 2$ agonists have a major role in asthma and have been the cornerstone for asthma management for several years till the role of steroids was identified. Beta 2 agonists especially short acting beta 2 agonists like Salbutamol have been used for the bronchodilator effects in the airways for a long period of time. However, monotherapy with $\beta 2$ agonists leads to desensitization and down regulation of $\beta 2$ receptors in the airways. Airways become refractory to their bronchodilator effect. Hence Beta 2 agonists have no role as monotherapy in management of chronic stable Asthma other than to obtain quick onset broncho-dilatation in an acute exacerbation^{4,5}. If this acts as reliever therapy.

Beta 2 Agonists in Combination with Inhaled Corticosteroids :

When combined with Inhaled Corticosteroids, $\beta 2$ -agonists also exert an anti-inflammatory effect. These effects include inhibition of release of oxidative bursts, thromboxane A2 and Leukotriene C4 from Eosinophils. There is also inhibition of release of mediators from neutrophils, and inhibition of the release of Th2 type cytokines such as IL-5 from peripheral blood lymphocytes. They have also been shown to inhibit release of granulocyte-macrophage colony-stimulating factor (GM-CSF) from cultured human lung fibroblasts. They also exert some amount of mast cell stabilizer activity. Despite this anti-inflammatory activity of the Beta2 Agonists, when used as monotherapy in vivo, (without the ICS), Beta2 Agonists both long acting and short acting, do not show any anti-inflammatory properties and hence cannot be used as monotherapy for management of Asthma. There is substantial down regulation of the Beta2 Receptors on prolonged use of SABAs alone. LABAs too have similar effects. Contrary to their in vitro anti-inflammatory effects, none

Table 1 — Common inhaled corticosteroids and their dosage

Inhaled corticosteroid	Total daily dose (mcg)		
	Low	Medium	High
Budesonide (DPI)	200–400	> 400–800	>800
Fluticasone propionate	100–250	>250–500	>500
Beclometasone dipropionate (CFC)	100–200	>200–400	>400
Ciclesonide (HFA)	80–160	>160–320	>320
Mometasone furoate	110–220	>220–440	>440
Triamcinolone acetonide	400–1000	>1000–2000	>2000

of the LABAs show an anti-inflammatory effect in vivo when used as monotherapy. Monotherapy with β_2 -agonists may even enhance the asthmatic-inflammatory process leading to a worsening of asthma control⁶.

Antileukotrienes :

Activated Eosinophils, T Lymphocytes, Mast Cells and Basophils release Cysteinyl Leukotrienes which are formed by arachidonic acid metabolism. Leukotriene (LT)3 C4, LTD4, and LTE4, collectively termed the cysteinyl LTs (cys-LTs), are peptide-conjugated lipids that are prominent products of activated eosinophils, basophils, mast cells (MCs), and macrophages⁷. The cysteinyl leukotrienes (Cys LTs) are potent lipid mediators implicated in the pathophysiology of asthma and allergic rhinitis (AR) whose effects include increased airway smooth muscle activity, microvascular permeability and airway mucus secretion⁸. Anti-Leukotrienes block the leukotriene receptors on the target organs thus reducing the inflammation as well as the bronchoconstriction.

Anti-Muscarinic Agents :

Bronchial smooth muscle contraction is the primary cause of reversible airway narrowing in asthma, and the baseline level of contraction is predominantly set by the level of cholinergic tone. Patients with asthma have increased bronchial smooth muscle tone and mucus hyper-secretion, possibly as a result of elevated cholinergic activity. Acetylcholine also exerts an inflammatory effect by inducing attraction and survival of inflammatory cells, with subsequent cytokine release. Hence long acting Tiotropium is now being identified as a potent bronchodilator in cases of severe asthma not responding to conventional optimal anti-inflammatory therapy.

Role of theophylline in Asthma :

Theophylline for several years have been used for their bronchodilator properties in asthma but there is evidence that suggests that Theophylline in a low dose act more as anti-inflammatory agents. At low doses, Theophylline acts by inhibiting Histone De acetylase enzyme (HDAC). This reduces recruitment of eosinophils in the airways. Thus, low dose theophylline act synergistically with the inhaled corticosteroids and can be used in patients who do not respond to regular ICS therapy. However, independently, theophylline are not effective in controlling the airway inflammation.

Anti IgE Antibodies :

Omalizumab is a monoclonal Anti IgE Antibody. It binds to the circulating IgE secreted by activated

plasma cells. It also reduces the expression of high affinity receptors on inflammatory cells like the Basophils, Mast Cells and Eosinophils. Thus, by reducing inflammation, it reduces asthma symptoms and prevents exacerbations⁹. Use of Omalizumab is limited to cases of very severe Asthma or uncontrolled asthma which does not get controlled even with high doses of ICS with optimal add on therapy despite good adherence to therapy and good technique of inhalation. Dose is dependent upon the level of serum IgE and body weight

Anti-IL - 5 Therapy :

Mepolizumab, Reslizumab, Benralizumab are monoclonal Antibodies that inhibits Interleukin 5 which is a key mediator in initiation and sustaining the Eosinophilic Inflammation. These drugs are effective only in those patients who have a predominantly Eosinophilic inflammation in blood and sputum and are steroid responsive. Careful selection of patients is recommended¹⁰.

Oral Steroids :

These are indicated only in those cases of asthma who are experiencing an acute exacerbation. Short burst of oral steroids in such cases for 8 to 10 days are effective and safe and can be stopped abruptly without the need for tapering them. Severe cases of Asthma not responding to conventional therapy may also require oral steroids for long durations. Such cases are rare. In such cases we must keep the patient maintained on a minimal possible dose and monitor for side effects of systemic steroids.

Assessing a Patient and Initiation of Therapy :

Asthma Management is not only about writing a prescription and giving to the patient. It is a process more of developing a patient- doctor partnership which is important for any chronic disease management. There are several other aspects to Asthma Management and a successful Asthma management protocol would include all these activities enlisted below preferably in the order given:

1. Developing a patient doctor Partnership
2. Identification and avoidance of triggers
3. Assessing the severity/level of control
4. Prescribing the medicines
5. Prescribing appropriate devices
6. Regular monitoring to check adherence and level of control
7. Correct technique of usage of device
8. Step up and Step Down
9. Asthma Action Plan

10. Addressing co-morbid conditions

Developing a Patients Doctor Partnership :

All chronic diseases bring with them several challenges in management but the most challenging is to have the patients' concordance in their treatment. This can only be achieved through a well strategized patient counselling session where physician explain the common issues that the patients have while accepting their disease, accepting the preferred modality of treatment, accepting that the treatment will be required for long durations and several other aspects of the disease that intimidate or perturb the patient.

Identification and Avoidance of Triggers :

During the initial visit, it is useful to identify what are the factors that trigger off the patient's asthma. This also helps us explain to the patients why they are getting recurrent symptoms and how can they avoid them. Common triggers are mentioned below:

- Indoor and outdoor air pollution
- Long standing dust inside the house/workplace
- Smoking and environmental tobacco smoke
- Occupational exposures/ Chemicals
- Damp mouldy walls
- Animal dander
- Cockroaches
- Drugs like beta blockers or NSAIDS
- Psychological stress
- Perfumes/ strong odours
- Food and drinks/ cold food

Assessing the Severity/level of Control :

In the first visit it is to be seen if the patient is in exacerbation. If the patient is in exacerbation the patient is to be treated as an exacerbation, if not then the patient is to be assessed by level of control, risk factors of exacerbations and spirometry. Nowadays, asthma treatment is guided by the step wise approach and severity of asthma is decided retrospectively depending upon what level of treatment the patient got controlled. Asthma control has two domains, one is the current level of control and the second is the future risk of asthma exacerbation.

Asthma Control :

With regular medications, the inflammation in the airway mucosa subsides and the hyperreactivity of the airways decreases. Thus, patients remain asymptomatic when the disease is well controlled. Symptoms are assessed on 4 parameters, presence of daytime symptoms, use of reliever medication, night-time symptoms and activity limitation. Presence of one or more of these indicates either partial control or

poor control. Level of control helps us what treatment to initiate and decide whether we need to step up therapy, step down therapy or continue with the current therapy.

Future Risk of Asthma Exacerbation :

Certain patients are predisposed to high chances of getting an asthma exacerbation. Patient with uncontrolled asthma symptoms, high SABA usage, no/inadequate ICS, poor adherence, incorrect inhaler technique, low FEV1 (<60% of predicted), major psychological/ socioeconomics issues and persistent exposure to triggers is at a high risk of exacerbation.

Stepwise Treatment of Asthma

Asthma treatment needs to be individualized as per the patient's severity of symptoms, frequency of symptoms, socio-economic conditions and beliefs and practices. However, while deciding the drugs and dosages, we need to consider the patients severity and frequency of symptoms. The dose needs to be constantly relooked into and titrated as per level of control. The patients need to be regularly monitored and dosages should be titrated as per level of control.

Step Up of Therapy :

Consider stepping up therapy to the next level if the patient does not remain well-controlled on the current step. However, we need to check and recheck the following before deciding step up:

- Adherence to the therapy
- Technique of using the device
- Environmental trigger factors
- Presence of any co-morbidities

Only when one is sure that none of the above factors are responsible for the poor control should one consider stepping up of therapy.

Step Down of Therapy :

Step down is an important aspect of asthma management. We should aim to maintain the patient well-controlled on medications but at the same time avoid any long-term complications of prolonged use of steroids. Hence, we need to identify the minimal possible dose on which the patient remains well controlled and continue the same. In due course we can also stop the therapy and see. If the patient remains well controlled, it is very good. However, if the symptoms recur, we need to restart the minimal dose on which the patient had remained well controlled. Key points to consider during step down:

- The patient should have remained well controlled for the past 3 months before we decide a step down.
- We aim at reducing the ICS by 25 to 50% depending upon the patient's condition.

- It is essential to convey to the patient that continuous monitoring would be required.
- The 'Peak Flow Meter' is an excellent tool for monitoring.
- Stopping the medication does not mean that he/she will never get symptoms. Asthmatic airways are hyper-responsive, and they will remain so.

Treatment of Co-morbidities :

Allergic Rhinitis and Gastro Oesophageal Reflux Disease are important co-morbidities associated with asthma. Identifying and treating these is very important as asthma may not get controlled despite optimal therapy if co-morbidities exist.

Follow-up and Monitoring :

Monitoring the patient for current level of control, any risk factors for exacerbation, adherence and good technique of using the inhaler device are important aspects of asthma management. Early first follow up is useful as one can address issues regarding acceptance of the disease and therapy, check technique of inhalation therapy and if required re-train in the technique. After the first follow up, the follow ups should be once every month. The physician should assess the following during follow ups:

- Assess symptom control/ Administer Asthma Control Test
 - Check PEFR/ PEFR record if being recorded
 - Check Inhaler technique
 - Administer Asthma Control Test
 - Consider step up/step down depending upon control
 - Gradually introduce:
 - PEFR Home Monitoring
 - Asthma Diary
 - Asthma Action Plan

Conclusion :

Asthma is an important public health problem of our country. It is a chronic disease and thus difficult to manage. The general physician should regularly update himself with the guidelines which are regularly updated for management of asthma. General physicians are

the first point of contact of a patient of asthma. Diagnosing and initiating the treatment is thus made by them. Correct diagnosis and correct first line of management will go a long way in improving the quality of life of the persons suffering from asthma.

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"Man needs his difficulties because they are necessary to enjoy success."

— **A. P. J. Abdul Kalam**

Review Article

Challenges and Adaptation in Healthcare Delivery during COVID-19: Perspectives from four different Service Providers

Mansij Biswas¹, Joydeep Ghosh², Sulagna Giri³, Susmit Naskar⁴

The corona-virus disease outbreak has tremendously disrupted the way of life for people from every social strata and profession. Healthcare workers, being on the frontline, are one of those who are facing the worst hit. Providing adequate and timely service to the community without jeopardizing self or family well-being has become an immense challenge. Not only had the people diagnosed as COVID-positive, even those who are visiting hospitals for other acute or chronic illnesses are facing severe logistic challenges in receiving optimum service. Similarly, learning and teaching activities have also taken a backseat due to lack of hands-on trainings and face-to-face meetings. A shift towards complete digitalization in scientific discussions has come to a rescue but with the caveats of technological unawareness and glitches. Appropriate usage of protective equipment, strict asepsis at workplaces, maintenance of distancing and following a healthy lifestyle must be incorporated in our daily life and workplace protocol as well. Here we describe the actual experiences from the routine of four medical professionals working at different fields and our perspectives on the same, keeping in mind the regular challenges that we face, how we are adapting to those, and how we view the way forward.

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Key words : Pandemic, Oncology, Medical Affairs, Surgery, Laboratory Medicine.

A Novel Strain of Coronavirus (SARS-CoV-2) was first reported in Wuhan, China in December, 2019 to cause Severe Acute Respiratory Symptoms (COVID-19)¹. Subsequently, this viral outbreak has spread to 213 countries and territories around the world and two international conveyances. A wide range of mortality rate has been reported from this viral illness and World Health Organization declared this outbreak as pandemic on 11th of March 2020². As of July, 2020, based on publicly accessible web database (Worldometer), the disease has infected around 16 million people globally with mortality rate of approximately 4%³. More importantly, this pandemic has caused severe disruption in our social, economic, professional and personal life. The social medias and news channels are now flooded with alarming statistics, on a daily basis. We have now started embracing SMS (sanitization, mask and social distancing) as the 'new-normal' way of life. Undoubtedly, Health-care Professionals (HCP) are one of the worst affected

Editor's Comment :

- COVID-19 might bring challenges, but could be an opportunity too.
- Quick adaptability is the key, with optimization of limited resources.
- Keeping healthcare professionals safe would benefit the society at large.
- Non-COVID medical needs should be addressed with equal importance.
- Digitalization is the way forward for all scientific communications.

segment, due to their nature of work as 'front-line warriors'. Till date, around 200 physicians in India have lost their lives while serving their duty. Moreover, the amount of physical and mental stress the whole community is going through is enormous. In this article, we have tried to capture the perspective on how the pandemic has affected the professional lives, learning curves and delivery of healthcare services from four different quadrant: practicing oncologist, practicing Spine Surgeon, Clinical Pathologist and Medical Affairs professional.

Perspective of a Practicing Medical Oncologist :

An analysis by Lee et al involving 800 patients, who had cancer and COVID-19 together demonstrated that major risk factors for death were advancing age, male gender and presence of other comorbidities⁴. There have been a rise in advisory guidelines, which have seen more of personal recommendations and suggestions rather than compilation of high levels

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evidence⁵⁻⁷. It is difficult to derive high quality data at such short intervals, so we have to rely on expert opinions. Studies that looked from the perspective of patients during COVID-19 revealed majority of them were worried regarding their cancer progression and wanted their chemotherapies to continue⁸. It becomes difficult to imbibe the best strategies at all times for the end users. Therefore, considering significant interplay between the health professionals and the patients with their families, it is important to know the individual perspectives of cancer care from the bedside rather than the command centre.

Effect on Routine Clinics —

There has been a significant impact on the way routine cancer care is being delivered. Starting from the point the patient and their relatives enter the hospital, they need to go through various screening processes to rule out subtle symptomatic cases. This increases their duration of stay inside the hospital. Multiple checkpoints have been installed to ensure that symptomatic cases do not mix with other patients. This leads to longer waiting time in the Outpatient Department. The delay takes a toll on the patience of our patients and relatives. Similarly, there is a longer delay in-between patients in the day care, as nurses have to change Personal Protective Equipment (PPEs) before they can administer the next chemotherapy. Many hospitals have resorted to reducing the number of appointments to account for these delays. This leads to cancellation of OPD appointments as well as day-care dates. This creates a problem especially for the patients who have undergone curative surgery and are awaiting adjuvant chemotherapy or radiotherapy. For patients who have COVID-19 infection, many consultants are delaying treatment for 14 days. Due to lack of enough evidence behind the above practice, we do not know how much their outcomes are getting affected. Unless we have more clarity on the interplay of COVID-19 and cancer treatment it is impossible to formulate high level guidelines.

Most of the Private Hospitals are charging a little extra that goes for buying PPE kits and the additional materials. The Government hospitals have the PPE from inventories. Cost-effective analysis for this increased cost is not available in peer-reviewed literature. However, it would be worthwhile to look at it considering this pandemic might last quite long.

Effect of Oncology Learning —

Due to the flurry of COVID-19 cases, Oncology learning has largely shifted from discussing randomised clinical trials to "How to manage cancer in COVID-

19". There has been a steep rise in webinars and lectures that deal with COVID-19 and cancer. COVID-19 related articles have crossed 55K mark at the time of drafting this article. Whether this is a setback for proper Oncological Clinical studies, only time will tell that. With the increase in the number of webinars due to the ease of conducting these, significant chunk of personal time is eroded by clinical discussion. In fact, pure oncology reading is a refreshment these days.

Effect on Patients and their Caregivers —

By far, this is the most significant aspect during this pandemic. There is heightened anxiety among patients due to the dual problem of cancer and COVID-19. Frequent cancellation of Chemotherapy radiotherapy or Surgery due to COVID-19 positivity is affecting their mental peace to a significant extent. Many patients are being upstaged due to the longer appointment date and coming to us at a higher stage after a prolonged symptomatic period. This will definitely affect the long-term mortality rates of the overall oncology population in the near future. The additional impact is having effect on the financial strain of our patients. Cancer treatment in itself is expensive, which is further complicated by longer ICU stay and intensive monitoring that is required if these patients get COVID-19 infection. The availability of oncology services also reduced significantly because of the shortage of staff in many hospitals. Many cancer hospitals have been turned into poor COVID-19 hospitals which is impacted patient care to a significant extent. Logistic difficulties have soared to great heights. Many patients are unable to come on the right time on the right date due to lack of logistic support and public transport. They have to hire personal vehicles, which adds on to the expenses.

Effect on Clinical Trials —

Due to the lack of on-site support and supporting staff, recruitment into clinical trials have also taken a backseat. Due to COVID-19 infection there is a higher number of adverse events that is occurring in patients who are ongoing treatment in clinical trials. These events might actually hamper the results of the clinical trial, which makes the whole process useless after so much of efforts. Patients are denied of potentially expensive and effective therapies due to halt of recruitment in these trials.

Perspective of a Practicing Spine Surgeon :

HCPs who are not directly associated with active COVID-19 management are also being greatly exposed to the risk of transmission from asymptomatic carriers (patients and colleagues). A spine surgeon is no

exception here, as he has to continue managing emergency spine problems with utilization of minimum healthcare resource, maximize patient and caregiver safety and prevent transmission.

Triage of Spine Surgery—

As this global pandemic is increasing at a rapid speed, it is obvious that COVID-19 patients will soon overwhelm our resource-poor healthcare system. By delaying elective procedures, surgeons can preserve hospital beds including ICU beds, ventilators, blood products, Personal Protective Equipments (PPEs) and these can be used for COVID-19 care delivery. Patients being operated carry the risk of acquiring nosocomial disease, and to manage a postoperative complication in an already exhausted healthcare setting could be challenging. Hence triaging of patients for surgery becomes cornerstone of spine-care. Surgery should not be delayed in cases with severe neurological symptoms due to compressive etiology, postoperative infection, epidural abscess, spinal instability threatening neural tissue damage etc. All other cases of spinal pain, neurological deficit that can be observed or reasonably controlled with medication for few months, can be postponed. This recommendation is primarily based on North American spine society (NASS) guidance⁹.

Pre-op Precautions : All patients are strongly recommended to undergo RTPCR testing for COVID-19 as routine pre-operative screening. In an emergent condition when COVID-19 report is not available the patient should be considered as positive. A detailed discussed protocol for operating room should be formulated to minimize the transmission in such scenario¹⁰.

Operating Room (OR) Set-up : It is of paramount importance to set up a COVID-19 designated OR, preferably away from other similar set-ups. If possible negative pressure ventilation should be installed. All stationary equipment like ventilators, computers should be covered. All surgical tools required for the procedure should be stocked beforehand. Minimum personnel for each job to be employed and minimization of OR traffic to be ensured. All personnel should wear all requisite protective gears as per guideline. Adequate training of donning and doffing of PPE should be done. The most experienced surgeon should do the surgery to minimize the surgical time and complications. Fellow, post-graduate or post-doctoral training may unfortunately take a backseat.

Extubation/ Intubation : As the virus is mainly shed through respiration, coughing, sneezing, intubation and extubation procedures produce huge

aerosols. To minimize that patient should be adequately paralyzed, covered with a transparent plastic sheet. Most senior anaesthetist should do the procedure. All personnel not involved should stand outside of OR. Postoperatively patients should be transferred through dedicated routes and to dedicated wards.

Considering elective surgeries are being postponed until COVID negative report, for emergency COVID positive or COVID unknown cases hospitals have established Standard Operating Procedure (SOPs). The anaesthesia part is the most critical as they come in close proximity to patients' respiratory systems. The step pods to reduce transmission are as follows:

- All patients are put on masks unless otherwise necessary
- All OT personnel wear full PPE kit
- Regional anaesthesia is preferred whenever possible
- Minimum personnel stays inside OT during anaesthesia and surgical team stays outside the OT during anaesthesia
- When general anaesthesia is necessary, the patient is given adequate muscle relaxant before intubation. A transparent plastic sheet is being kept on the patient's face and upper body and intubation is done by inserting a hand above it. It is a simple cost effective but very efficient way to reduce aerosol generation
- This procedure is being followed again during extubation
- Surgical team enters OT after 15 minutes of intubation and exits before extubation

On-call Management : A Spine Surgeon must attend the emergency room on call service with complete PPE. The unit should divide work of on-call management, OR, OPDs and take two weeks off after two weeks of work, though this system may not be feasible in smaller units.

OPD Management : Majority of OPD patients in our Spine Clinic are old age population with various co-morbidities and having degenerative spine disease. These patients are more vulnerable to contracting the viral illness. As most of the State Governments are imposing lockdown to reduce transmission, telemedicine should be encouraged among patients and caregivers, when appropriate and feasible. Video consultation can give detailed patient report and may substitute a physical visit, in selected cases. If some patients require direct consultation they should be properly screened for any COVID-19 related symptoms, travel history, infrared thermal screening,

etc. Proper use of masks, practicing adequate hand sanitization and physical distance between doctor and patient are mandatory (a transparent plastic screen could be helpful).

Surgeons' own learning : Continuous Medical Education (CME) occurs through various conferences, seminars, cadaveric courses, operative courses. Due to worldwide lockdown all such have been called off, and e-learning took the driver's seat. Various webinars are being conducted, where the discussions are revolving mainly on new guidelines of managing spine patients in COVID-19 era, albeit, students and trainees are mostly affected in their learning as they have a stipulated time limit for their course completion.

Spine Research : Operative and non-operative research activities are definitely affected globally as the number of cases are drastically reduced. In such time, a surgeon may try to maximize the free time for personal reading and data compilation of previous surgeries.

Perspective of a Pathologist from the Field of Laboratory Medicine :

In this rapidly transformed crisis period, the Laboratory Medicine is playing a major role in testing the massive size of our population. The laboratory system has altered in order to validate testing in-house, to procure sufficient reagent, swabs and instruments to set up COVID-19 testing for supporting our health system and the community. Main challenge for the entire diagnostic facility is to maintain the normal workflow for routine activities. With growing number of cases every day, regular laboratory work is significantly affected in view of higher turnaround time and diminished work force. The laboratory staffs are one of those frontline fighters in this pandemic who are risking their own health. Due to high transmissibility of this virus, doctors and staffs of diagnostic laboratories are facing genuine challenge as test samples and specimen can contain the pathogen and thus handling those make us vulnerable albeit proper safety precautions¹¹⁻¹⁴.

Effects on Daily Routine Work —

The laboratories must continue the daily routine work alongside COVID-19 testing as per Government regulation. To ensure proper safety for all the persons working in a laboratory, a new quality manual has been implemented with proper guidelines for all the pre-analytical, analytical and postanalytical phases of laboratory testing and analysis. In day-to-day practice, the safety of lab personnel has to be balanced against timely reporting of results and high quality analysis.

Both doctors and technicians face obvious fear as blood & urine samples, body fluids and other tissue specimen can contain viable and transmissible virus. So maintaining the proper guidelines regarding handling and processing of every sample and specimen is necessary to minimize the impact on laboratory personnel. Considering potential infectious nature, appropriate PPE is being worn while obtaining and handing samples or specimen and frequent cleaning of the laboratory has become an absolute necessity. Also the number of staffs within laboratory has been reduced to maintain proper distancing while working, and allowing sufficient time between two shifts of a particular staff. All these factors are leading to obvious delay in reporting of routine tests. Patients are also suffering due to long waiting period for getting the test results. This in turn causing delay in managing the patients. Though COVID-19 has clearly become the center of attention at this moment, but we must also not forget that patients still need laboratory specialist doctors for their diagnosis and disease progression.

The precautionary measures are primarily targeted to minimize the spread of the virus, both to the person in charge of handling samples and to the environment in which the samples are processed. For this, specific persons are assigned to carry the samples from COVID wards, emergency and also the samples collected for COVID testing with full PPE including face shields and goggles. The samples are handled in a separate negative pressure room and processed in class 2B bio safety cabinet. Only specially trained technical staff and doctors are allowed to process the sample wearing full PPE. Donning and doffing of PPE are done in designated areas. After each batch of testing, surfaces are cleaned with hypochlorite solution and cabinets are sterilized with UV light. For floor and wall mopping, sodium hypochlorite solution is used after completion of daily routine work. After testing is done, all samples are discarded in a special double-layered bag designed to discard only tested samples. Bags are air sealed before taking it out of the room for disposal.

Effects on Learning and Training Program —

Teaching and training program in laboratory also took a back seat in this COVID-19 era. Hands-on training program has been replaced by webinars and online lectures in order to maintain social distancing. This pandemic is also encouraging the implementation of digital pathology, not only in day-to-day work, but also as a tool of teaching and education. It will also provide easy access to expert opinion for difficult cases. However, it is too early to tell that digital pathology, webinar or online teaching program is

enough for teaching the future laboratory specialist.

Perspective of Medical Affairs Professional from Pharmaceutical Industry :

Situation and Tasks —

Medical Affairs (MA) helps in bridging the critical gap between the pharmaceutical industry and its internal and external stakeholders. MA has evolved significantly in the past few years from a supportive function to an instrumental role player, for generating and implementing scientific insights and drive patient-centered solutions aligning with the organizational strategy. This function is unique in managing external relationships with key opinion leaders (KOLs) within the scientific community across different therapeutic area, as well as with patients, payers, regulatory bodies, authorities, healthcare organizations, clinical research units and many more. Internally, the MA personnel works within a cross-functional environment, effectively links scientific evidence with promotional activities in an ethical and credible manner, thus reaching a larger audience with better value-proposition for all end-users¹⁵. Many a times these actions are driven through face-to-face and peer-to-peer interactions, which involves a lot of travelling within or outside city/regions quite frequently. With the sudden lockdown imposed, leading to severe travel constraint and lack of face-to-face meetings, the MA function faced a herculean challenge to embrace the paradigm shift with heightened digitalization of interactions. However, this challenge was taken positively and the situation was turned into an opportunity. Arguably it became of paramount importance to improvise, innovate and maintain the connect with all the stakeholders without the traditional meeting formats. The task was not easy, and as we know “when the going gets tough, the tough gets going”, the MA professionals got themselves prepared and adapted to the change, quickly and efficiently.

Action and Results —

How did MA leverage on the opportunity? The first and foremost challenge was probably revamping all the medical communications, making them suitable and interactive, yet user-friendly to be discussed over virtual platforms. No doubt, many of senior opinion leaders showed extreme agility to get accustomed with the virtual platforms within a short span of time, despite initial challenges, and medical affairs professionals had a key role to play in such transformation. Needless to say, HCPs too have accepted this new mode of communication positively and as a valuable tool to keep themselves updated. Especially, at a time when they

wanted to share experience and learn from the stalwarts in the same platform, not only on their respective areas of interest or expertise, but on also how science is evolving with respect to the pandemic situation. Definitely, saving on travel time and converting them to productive hours worked as a boon in many sense. Similar impactful scientific discussion are happening over virtual platforms over shorter time span (without the humane touch, I must say), while the spared time are being utilized (which otherwise would have been spent on commuting) in developing content, working on scientific projects, formulating research hypothesis, and other various forms of medical writing, to name a few. It has also become easier to reach and connect with more HCPs across a wider geographical area. Being virtually connected with patient-support groups and caregivers, to increase awareness has been a value addition to the MA role. We have become more technology-savvy, data oriented, outcome-driven and impactful like never before. This actually could pave down the path for future trends, as in the post-COVID-19 era, this digital shift is expected to continue long-term. What MA have experienced in past few months is a massive expansion of scientific and training engagements with providers, patients, and other cross-functions, across a vast range of touchpoints that are entirely digital. These have been designed in a way to provide tailored information to those who actually need it, thus focusing on a more personalized approach. Albeit the challenges, this could be a grand learning opportunity for MA to improve on certain soft skills, ability to influence over virtual platforms and decision making capabilities^{16,17}.

Need of the Hour and Way Forward :

Considering the novelty of the situation and the disease process, we must learn to tackle each problem through different individualized approaches.

- Multi-specialty or super-speciality hospitals(for eg, a tertiary oncology care centre) should not be converted into dedicated COVID-19 centres.
- Delay in treatment of non-COVID-19 illness(due to lack of hospital bed or treatment provider or other resources) may lead to increase in mortality of the overall population
- Optimum usage of PPE, strict asepsis and appropriate shift-work (avoiding long-shifts) with adequate quarantine facility in between are advisable to prevent self-contamination and thus subsequent inevitable resource loss for healthcare delivery
- There should be prospective studies looking at the interplay of COVID-19 infection and various other disease processes including interactions of

therapeutic agents and anti-COVID-19 drugs

■ This pandemic is causing extra challenge than usual, towards providing high quality service in a timely manner with minimal risk to the healthcare workers and their families. Adopting new practices and following additional measures that directly or indirectly affect all aspects of workflow should become a standard practice at all set-ups

■ We must become familiar with digital technologies, to the best of our abilities. This is surely going to remain as the preferred mode of communication as far as the scientific discussion and sharing of expertise or experience is concerned

However, even considering these as setbacks, we must focus on our mental and physical well-being as well. It is important to keep the immune system healthy by having a balanced diet, proper sleep and some exercise or yoga at regular basis. This is inevitable that even on returning to a relatively normal time, some of these adaptive practices will be embedded as a part of future protocol for a safe work place. Whether the solution lies in herd immunity or an effective vaccine, only time will tell us. Until then, we all need to keep our fingers crossed, and continue to serve our patients relentlessly.

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Mansij Biswas is an employee of Boehringer Ingelheim India Pvt Ltd. His contribution to this manuscript represents his independent viewpoints related to the topic and does not represent in any way, the opinion of Boehringer Ingelheim. Rest of the authors have no competing interest to disclose.

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Review Article

Mask for All – Physical & Immunological Barrier of COVID 19 !

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Shashank R Joshi⁵, Santanu K Tripathi⁶**

The COVID-19 pandemic which started in late 2019 is still continuing unabated, rather with resurgence of cases in certain areas globally. Even with the emergency use authorization of several vaccines and extensive vaccination programs, we are yet to bring the pandemic to its knees. The present scenario has more than ever highlighted the importance of face masks in controlling the infection and transmission of the SARS CoV2 virus. In this review article, we discuss the evidence available to date to support the use of masks as a protective barrier to limitvirus entry. We also discuss how masks indirectly help stimulate protective immune responses and provide a comparative glimpse on the characteristics of various masks.

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Key words : COVID-19, Masks, Immune response, Pandemic.

The whole world is now waiting eagerly to be vaccinated against SARS-CoV2 virus. A few vaccines are already being used by several countries to vaccinate their citizens while many others are in advanced stages of development. A vaccine is a product that stimulates a person's immune system to produce immunity to a specific disease and protects the person from that disease¹. Vaccination is a form of active immunization. Vaccine is a biologic in the form of an antigen, as a whole, killed (inactivated) organism; attenuated (live) organism; or a specific protein or peptide constituent of an organism which is responsible for active immunity against infectious diseases, cancers and a few auto-immune diseases². A face mask is obviously not a vaccine as per definition. In a lighter sense, it generally shows an immense preventive role in COVID 19 pandemic. Masks reduce transmission of COVID 19 infection, decrease viral load and in turn trigger both T cell and B cell immunity. It is neither a biologic, antigen (whole, killed or inactivated organism), live attenuated organism nor a protein or

Editor's Comment :

- Masks reduce transmission of COVID 19 infection, decrease viral load and in turn trigger both T cell and B cell immunity
- Adherence to the universal face-covering policy helps to mitigate the spread of SARS-CoV-2.
- Along with its use, proper storage, cleaning and disposal of masks are essential to make them as effective as possible.

peptide constituents of organism; mask is a protective barrier which limits virus entry and indirectly helps stimulate protective immune responses.

On April 3, 2020 the Centre for Disease Control, USA (CDC) had recommended cloth face coverings due to frequency of asymptomatic transmission. They had used the slogan – “protect others”. This slogan was updated on September, 2020 in California – “protect yourself and others”.

Table 1 suggests that use of any type of mask is probably going to decrease viral exposure and infection risk on a population level. Use of mask in outdoor and in specific indoor cases should be mandated by the Government till any new conflicting evidences are generated.

Table 1 — *Level of Exposure and Wearing Mask³*

COVID 19 Carrier	Risk of Spread	Healthy Person
Without Mask	High	Without Mask
Without Mask	Moderate	With Mask
With Mask	Low	Without Mask
With Mask	Extremely Low	With Mask
With Mask	No Risk (with 6 ft Social Distancing)	With Mask

Evidences :

In a study with 9850 health care workers it was found that 1271 (12.9%) had positive results for SARS-

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CoV-2. During the pre-intervention period (not using universal mask) it was observed that the SARS-CoV-2 positivity rate increased exponentially from 0% to 21.32%, with a weighted mean increase of 1.16% per day and a case doubling time of 3.6 days (95% CI, 3.0-4.5 days). During the intervention period, with initiation of universal mask usage, the positivity rate decreased linearly from 14.65% to 11.46%, with a weighted mean decline of 0.49% per day. The net slope change was 1.65% (95% CI, 1.13%-2.15%; P<0.001). There were more declines per day compared with the pre-intervention period. Results of this study support universal masking as part of a multipronged strategy in health care settings to reduce infection⁴.

In another report it was found that 139 clients of a salon were exposed to two symptomatic hair stylists with confirmed COVID-19. The stylists and the clients wore face masks. There were no reported cases of secondary symptomatic cases. Among 67 clients tested for SARS-CoV-2, all test results were negative⁵. It was concluded that adherence to the universal face-covering policy helps to mitigate the spread of SARS-CoV-2.

A Few Important Statements :

"Handwashing, physical distancing and use of mask in public and work places will help us to overcome this difficult time" — Prof (Dr) Balaram Bhargava DG-ICMR

"These facemasks are the important, powerful public health tool we have ... I might even go so far as to say that this face mask is more guaranteed to protect me against COVID than when I take a COVID vaccine." CDC Director, Sept 16

"Well, if people are not wearing masks, then may be we should be mandating it" — NIAID Director, October 23, 2020

Mask, A Double Edged Sword to Fight against COVID-19 ?

It is important to explore the right answer to COVID 19 pandemic, to find whether some agents can reduce the transmission rate and decrease morbidity. Universal mask usage can efficiently address these two issues. Universal mask use can decrease both infectivity and severity of COVID 19 virus infection. Different epidemiological studies suggest that approximately 40-45% of infected persons with SARS-CoV-2 virus remain asymptomatic. These studies suggest that the virus might have greater potential to spread silently among man. Asymptomatic persons can transmit SARS-CoV-2 to others for longer than 14 days. The absence of COVID-19 related symptoms in persons

infected with SARS-CoV-2 might not necessarily signify an absence of harm⁶. Depending on the type, masks can be used for either protection of healthy persons or to prevent onward transmission (source control).

Types of Masks :

Medical masks are recommended for all health workers and in clinical settings, for those who are symptomatic, anyone awaiting COVID-19 test results or who are tested positive and the caregivers of these patients⁷.

Universal masking in health facilities is defined as the requirement for all persons (staff, patients, visitors, service providers and others) to wear a mask at all times except for when eating or drinking⁸.

Recommendation of medical mask also includes people aged >60 yrs, people with severe chronic comorbidities like chronic respiratory disease, cardiovascular disease, cancer, obesity, DM and immune compromised patient.

Non-medical, fabric masks or cloth mask can be used by the general public under the age of 60 and who do not have underlying health conditions. It should meet three essential parameters-filtration, breathability and fit^{7,8}.

Medical masks (also known as surgical mask) are composed of three layers of synthetic non-woven materials, configured to have filtration layers sandwiched in the middle. They are available in different thickness and have various levels of fluid resistance and filtration. They are single use disposable masks⁸.

Respirators (also known as filtering face piece respirators - FFP) are available at different performance levels such as FFP2, FFP3 (EU Standard), N95, N99 (NIOSH certified). Such masks have high fluid resistance and provide protection to the wearer from droplet of infectious material emitted during coughing/sneezing/talking⁹.

Medical masks and respirator masks are similar in terms of protective value. However respirators are specific for certain procedures because they have a tightly fitted component to them.

WHO does not recommend masks or respirators with exhalation valves.

Along with its use, proper storage, cleaning and disposal of masks are essential to make them as effective as possible (Table 2).

Masks Reduce Virus Inoculum :

90-95% viral particles filtered via N95 masks and 65-85% viral particles are filtered via cloth or surgical masks, if used properly. Less viral inoculum leads to an advantageous position for hosts. Reduced viral

Table 2 — Comparative characteristics of different types of face masks¹⁰

	Multilayered Cloth Mask	Medical Mask	N95/N99 Mask
Filtration efficacy	50-70 %	99% particles >0.3 µm; 75% particles <0.3 µm	99.9% particles >0.3 µm; 85 % particles <0.3 µm
WHO recommendation for use	General public use	People at high risk of COVID-19, those with COVID-19 and healthcare workers	People at high risk of COVID-19, those with COVID-19 and healthcare workers
Reusability	Yes	No	Cautious reuse due to availability constraints
Washing/treatment methods before reuse	Washed daily or immediately after use with soap and warm water	Single use	Can be cautiously reused hydrogen peroxide, dry heat pasteurization, ultraviolet irradiation and moist heat

inoculum could be responsible for less viral disease. LD50 is defined as the virus dose at which 50% exposed hosts die. This is generally determined via experiments in which a range of doses are injected to animals to calculate a dose-mortality curve. Many animal studies have shown dose-response for other viruses. Increase in virus inoculum is directly proportional to virus related morbidity and mortality. In Syrian hamster model study, micro-CT analysis had revealed that severity of the pulmonary abnormalities is related to the degree of infectious dose of SARS COV-2¹¹. Upper respiratory tract viral RNA replication, distinct lung pathology and post viral fatigue were observed most consistently in the high virus inoculum dose group in ferret model of SARS-CoV-2 infection¹². As masks can reduce virus inoculum, it will reduce the infection associated morbidity and mortality. In golden Syrian hamster SARS-CoV-2 model it was found that non-contact transmission was 66.7% (10/15) of exposed naive hamsters. Surgical mask partition had significantly reduced transmission to 25% (6/24, P = 0.018) and surgical mask partition for challenged index hamsters had shown significantly reduction in transmission to only 16.7% (2/12, P = 0.019) of exposed naive hamsters. Intervention with surgical mask partition had shown lower clinical scores, milder histopathological changes, and lower viral nucleocapsid antigen expression in respiratory tract tissues¹³. Though human studies are rare due to valid ethical reasons; a few studies support this hypothesis. Challenge studies¹⁴⁻¹⁶ have been conducted in human volunteers by injecting wild-type influenza A at different doses. It was found that higher doses are associated with more severe disease manifested by more severe cough and shortness of breath.

Lessons from 1918 – 1919 Influenza Pandemic :

The second wave of pandemic generally produces less severe pathology due to development of immunity but the influenza pandemic of 1918 was an exception. Scientists postulated that exposure to higher infectious dose with 2nd wave after May 1st, 1918 was associated with higher mortality¹⁷. So before the start of the second wave of COVID 19 pandemic, it is extremely important to strengthen preventive measures so that history is not repeated.

Interesting Evidences :

In one study conducted among health care workers it was found that most infections had occurred at the early stage of the epidemic, when there were lacks of protective measures¹⁸. Another study suggested that social distancing can reduce the speed of the spread of SARS-CoV-2 in a cohort of young, healthy soldiers. This study had suggested that social distancing and other preventive measures can induce an immune response by colonizing in nasal passages. Dose of viral inoculum during infection or mode of transmission may determine the clinical course of COVID-19. Out of 354 soldiers, 30% fell ill from COVID-19. They were infected prior to the implementation of social distancing. In a group of 154, no soldiers were suffering from COVID-19, where infections appeared after implementation of social distancing. Despite the detection of viral RNA in the nose and virus-specific antibodies within this group, no soldiers were suffering from any symptoms¹⁹. The question which arises is whether we are getting more asymptomatic carriers due to the use of masks. Cruise ships experiences are good experiments in this case as they are closed settings. In one study, researchers had conducted statistical modelling on publicly available data to analyze the asymptomatic proportion among the COVID-19 cases on board the Diamond Princess cruise ship. Their estimated asymptomatic proportion was 17.9% (95%CI: 15.5–20.2%)²⁰. Another Japanese study had shown similar results. They had shown asymptomatic COVID 19 patients were 33.3% (95% CI: 8.3–58.3%) among the Japanese citizens who were evacuated from Wuhan²¹. After an Argentine ship had an outbreak, they gave surgical masks to all the passengers and N95 masks to all crew members. It was found that 128 out of 217 passengers and staff eventually tested positive for SARS-CoV-2, but majority

of the positive patients (81%) remained asymptomatic²². Another study in a pediatric hemodialysis unit had shown a high prevalence of subclinical seroconversion while using masks. Two out of 11 health care workers who were involved in caring for two patients with subclinical seroconversion developed SARS-CoV-2 antibodies. Health care workers had not developed any symptoms. All seroconversions were associated with no symptoms.²³ Different media reports also point to the fact that usage of masks reduces the disease severity while increasing the proportion of asymptomatic COVID 19 patients. It was reported that 95% asymptomatic cases out of the total people affected in outbreaks in Oregon seafood plant and Arkansas Tyson chicken plant after issuing mandatory mask regulation. Initially there were more illness and sufferings among the workers²⁴. In a SEIR model [susceptible (S), exposed (E), infectious (I) and recovered (R)], it was shown that social distancing would reduce 50% of infection whereas masking would decrease infection in 80% of the population. This model had also suggested that universal masking at 80% adoption would be responsible for 60,000 deaths but a strict lockdown would result in 1,80,000 deaths. At only a 50% adoption rate of masking was not shown to be sufficient to prevent continued spread and eventually results in 2,40,000 deaths. That study group had also suggested that replacing the strict lockdown with social distancing without masking results in exponential COVID 19 infection spread.²⁵

Mask & Immunity :

Host immune responses play major role in pathogenesis in viral infections. High doses of viral inoculum can devastate innate immune defenses which can lead to dysregulation of innate immunity. Dysregulated immunity has increased severity of viral infection²⁶. Use of mask in an appropriate way can reduce viral load and may be beneficial for patient by preventing disease severity. Asymptomatic or patients with mild infection would experience strong T-cell & memory B-cell immunity. CD4+ and CD8+ T cells, along with other factors, help in producing a coordinated immune response, first resolving an acute viral infection and then producing protection against reinfection. There is a certain difference noted between immune response directed against SARS-CoV-2 versus SARS-CoV-1. Immune response after SARS-CoV-2 represents broader spectrum compared to SARS-CoV-1. T cell mediated immunity is largely specific for spike protein. In a study it was shown that the breadth and magnitude of the T cell response is greater in more severe COVID 19 patients. But the

proportion of the T cell response that is related with CD8+ (rather than CD4+) T cells is higher in mild infections²⁷. This finding is consistent with findings in another study. This study had shown higher percentage of activated and proliferating CD8+ T cells production in mild as compared to severe COVID-19²⁸. These findings emphasize the protective role for SARS-CoV-2-specific CD8+ T cells. In infected lung in mild COVID 19 patients, a greater proportion of clonally expanded CD8+ T cells were found²⁹.

Conclusion :

Mass vaccination would take time to reach every corner of the world. Available vaccines are developed in a compressed timeline which raises questions on their safety and efficacy. We do not have any data regarding their long-term safety. Appropriate use of masks, which is cheap and accessible, could be an effective way to fight against this epidemic. Resource constrained countries should adopt universal mask use protocol as a strict regulatory policy. A behavioral change with effective health education is extremely important in this perspective. Mankind has faced challenges of COVID 19 pandemic very recently but there are many more challenges like air pollution, threats of other non-communicable diseases like tuberculosis etc., where policies for universal, appropriate mask usage would help mankind approach these problems holistically.

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Case Report

Laparoscopic Management of Acquired Diaphragmatic Hernia

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Diaphragm is a dome shaped Musculo-tendonous septum separating the thorax from abdomen. It develops from septum transversum, mesentery of foregut, body wall, and pleuroperitoneal membrane. These four parts fuses and close the primitive communications between pleura and peritoneal cavities. Defect any where can lead to development of hernia. Diaphragmatic hernias can be congenital or acquired. Majority of congenital diaphragmatic hernia are antenatally diagnosed and repaired when haemodynamic and cardiorespiratory physiology is normalised 24hrs after birth. Some may present as acute respiratory distress postnatally and some may remain asymptomatic and diagnosed incidentally. Acquired diaphragmatic hernias are common among adult and the most common aetiology responsible is trauma including both blunt and penetrating one. Adults with diaphragmatic hernia may have varied presentation. They may present acutely, may have unexplained symptoms or may be discovered months to years after being evaluated for some disease or symptom. Due to the negative intra-thoracis pressure and depending upon the site of defects, intra-abdomen or retroperitoneal organs or tissue may prolapse inside the thorax. Surgical treatment of diaphragmatic hernia is mandatory to prevent potentially serious associated complication. Since the advent of minimal access surgery, laparoscopy has taken significant role compared to tradition laparotomy or thoracotomy approaches. We present the case series of two traumatic diaphragmatic hernia cases and the role of laparoscopy in the management. This case series and literature review highlights the unusual presentation of chronic post-traumatic diaphragmatic hernia and feasibility of primary laparoscopic repair.

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Key words : Acquired Diaphragmatic Hernia, Laparoscopy, Congenital Diaphragmatic Hernia.

Diaphragm is a musculo-tendinous partition separating the abdominal viscera from the chest. It has a powerful musculature that helps us in breathing. It develops from the fusion of septum transversum, mesentery of foregut, body wall, and pleuroperitoneal membrane. Diaphragmatic hernias can be congenital or acquired. Congenital diaphragmatic hernia occurs due to the incomplete formation/muscularization in the development and allow abdominal viscera to fill the chest cavity. Prenatal ultrasonography is successful in diagnosis of congenital diaphragmatic hernia as early as 15 weeks gestation and earlier the diagnosis, worst the prognosis¹. The prevalence of Congenital Diaphragmatic Hernia (CDH) is estimated at 3-3.6/10,000 live births² and with slightly higher male predominance³. Majority of patients present with severe respiratory distress in neonatal period and only 5-10% present after infancy with varied presentation. Only 1% of individuals are completely asymptomatic and the defect is discovered incidentally on imaging studies⁴.

Acquired diaphragmatic hernia is common in adults and results from either blunt (35%) or penetrating trauma (65%)⁵. Blunt trauma produce rupture(due to rapid

Editor's Comment :

- For diagnosing a diaphragmatic Hernia High index of suspicion is very important.
- We need not have much advanced investigations for diagnosis- a plain standing x-ray chest with both domes should be enough for diagnosis, augmented by CT scan.
- Diaphragmatic hernia can be managed easily by laparoscopic technique with excellent results.

elevation of diaphragm) and radial tears of diaphragm whereas penetrating trauma produces small perforations. Traumatic diaphragmatic hernia and diaphragmatic injuries in general are difficult to diagnose up to 31% of patients may demonstrate no abdominal tenderness and 40% may have normal chest radiograph⁶. Because the penetrating injuries produces small perforations, they remain salient and asymptomatic for months to years and may later on lead to diaphragmatic hernia possibly with incarceration or may be strangulation. The surgeon in general and accident emergency residents in particular should prompt appropriate investigations in patients with clear history of thoracoabdominal trauma and high clinical suspicion of traumatic diaphragmatic rupture.

Traumatic diaphragmatic hernia should always be repaired once diagnosed in order to decrease the morbidity and mortality associated with it. The traditional thoracotomy and laparotomy approaches have been taken over by laparoscopy since the advent of minimal

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access surgery. We hereby present case series of two of our traumatic diaphragmatic hernia subjects and their laparoscopic management. Our case series highlights the unusual, delayed presentation, diagnosis and management of chronic traumatic diaphragmatic hernia in adults.

Case 1 :

50-year-old female, P2L2 without any underlying comorbidity, presented with one-day history of pain upper abdomen and multiple episodes of vomiting in our accident and Emergency Department. Patient was subjected to thorough physical and clinical examination which was unremarkable. Any past surgical and medical history was excluded. Baseline haematological and biochemical investigations including complete blood count, Kidney/Liver function test, serum electrolytes, radiography of chest and ultrasonography of abdomen was ordered. Except elevation in left hemi diaphragm in radiography of chest, rest of the investigations were grossly normal (Fig 1). In view of X-ray chest findings, history was again reviewed and patient recalled the event of significant blunt trauma left lower chest some 5 months back. Contrast enhanced computed tomography of chest and abdomen was ordered which revealed the left diaphragmatic hernia with herniation of stomach and spleen with collapse of ipsilateral lung and mild pleural effusion.

Patient was planned for laparoscopic repair of hernia under general anaesthesia. Pre-anaesthesia check-up made and patient was cleared for procedure. The procedure and associated complications explained to the patient and accompanied legal attendants in their own language and written informed consent was taken.



Fig 2 — Radiograph and CECT of Chest (Case 2)

planned for laparoscopic repair on rounds in the next list. Written informed consent taken and intravenous dose of 1gm of ceftriaxone was given before the procedure.

Procedure Details :

The procedure was performed in supine position under general anaesthesia using three ports and 30-degree camera. Operating surgeon, assistant and scrub nurse on right side, monitor on left head end and operating table in left up and reverse Trendelenburg's position. Nasogastric tube was put in by anaesthesiologist. Pneumoperitoneum created via Veress needle and primary port made above umbilicus.

Diagnostic laparoscopy was done and diagnosis of diaphragmatic hernia confirmed. Rest of the two ports were created under direct vision one on either side of primary port. Whole of stomach, spleen and part of omentum had herniated in Case 1 and multiple loops of small intestine in Case 2. However, no signs of incarceration, obstruction or strangulation were noted. There were no apparent ischaemic changes of bowel or other hernial content, however, there was significant collapse of left lung in Case 2. The hernia contents were reduced using atraumatic laparoscopic graspers and defects measured as 6x6 Cms in Case 1 and 5x6 Cms in Case 2. Multiple small adhesions in Case 1 were meticulously dissected using Harmonic Scalpel and free edges of hernia defect were demarcated. Spleen was pulled down gradually with steady traction, chest cavity visualised and fluid aspirated.

The defects were closed in two layers, first layer by

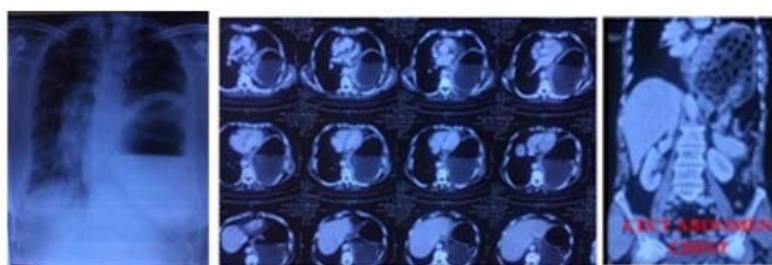


Fig 1 — Radiograph and CECT of Chest (Case 1)

Patient was given 1gm of intravenous ceftriaxone before the intubation in operating theatre (Fig 1).

Case 2 :

17-year-old female, unmarried, without any known medical comorbidity, presented with upper abdominal discomfort since last one year and also gave history of thoraco abdominal trauma some 4 years back. Since last one year patient was subjected to multiple ultrasonography abdomen focussing on hepatobiliary

barbed suture (STRATAFIX) and second layer interrupted 1-0 polypropylene. 26F tube drain placed in left pleural cavity in both the cases. Another tube drain was placed in left sub-phrenic space in case-1. After final laparoscopic look, pneumoperitoneum was deflated, working ports were removed under vision followed by primary port. Primary port closed with 2-0 Vicryl and both the patient extubated uneventfully and shifted to high dependency unit of our surgical ward. Both the patients were monitored critically during first 24hrs of postoperative period. Oral liquids started in 48hrs in Case 1 and after 24 hrs in Case 2. The chest tube drains were removed 36hrs after operation and normal check-radiograph of chest. Post-operative antibiotics continued for 48 hrs. Case 1

discharged on 5th post-operative day and Case 2 on 4th day and were attached to our out-patient department for follow up. Both the patients are doing well as of now in the past 3½ years follow-up period (Figs 3,4,5).

DISCUSSION

Trauma including blunt and penetrating to the upper abdomen can both result in diaphragmatic rupture/hernia with penetrating trauma being the leading cause accounting for 65% cases⁵. Approximately 0.8 to 3% patient of thoracoabdominal trauma are associated with diaphragmatic rupture^{7,8}. This loss of integrity may cause the abdominal organs to shift upwards into the thorax due to the pressure difference between the two cavities and presenting as diaphragmatic hernia. Left hemidiaphragm injuries are diagnosed more commonly than right in blunt trauma, likely as a result of force-distribution protection afforded by extensive solid parenchymal mass of liver⁹. The patients of diaphragmatic hernia may be diagnosed immediately after trauma or some cases may remain asymptomatic and diagnosed during evaluation for various symptoms. Patients of acquired diaphragmatic hernia can have respiratory symptoms like shortness of breath or chest pain, abdominal symptoms like recurrent pain abdomen, post-prandial fullness or may have obstructive symptoms¹⁰ and some can have cardiac symptoms¹¹.

In order to prevent the occurrence of serious complications, the surgical management of diaphragmatic hernia is mandatory once the diagnosis is made. Therapy entails either primary repair with permanent non-absorbable sutures or prosthesis in case of large defects which would require undue tension in muscular edges if repaired primarily. Chinnusamy Palanivelu *et al* and Yoshihiro Kitano *et al.* in their respective studies on diaphragmatic hernias, have recommended use of meshes in defects exceeding 20 to 30 cm^{12,13}.

Approaches of diaphragmatic repair in a haemodynamically stable patients include traditional ones (laparotomy or thoracotomy) and newer minimal access approaches (laparoscopy or thoracoscopy). Both the laparoscopic and thoracoscopic repair of adult diaphragmatic hernia, have been reported in the literature¹⁴. Thoracoscopy has advantages in cases with dense adhesions between hernial contents and lung. Laparoscopic diaphragmatic

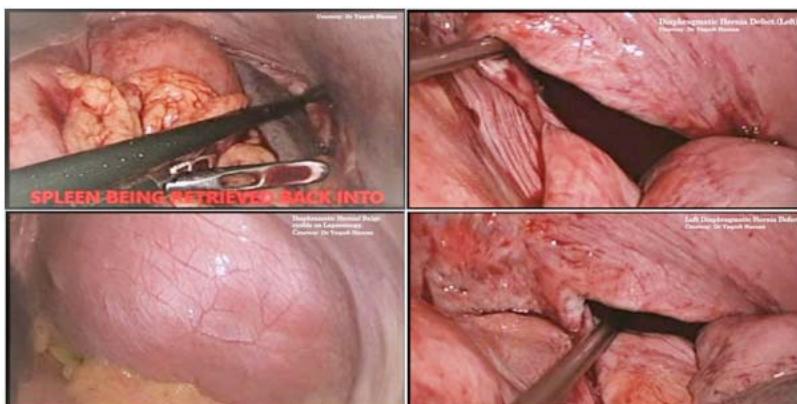


Fig 3 — Intra-operative Photographs of Case 1



Fig 4 — Intra-operative photograph of spleen retrieval of Case 1



Fig 5 — Intra-operative photographs of Case 2

hernia repair is increasingly reported to be an acceptable, safe with minimal morbidity and postoperative pain and performed in times comparable to those required for open surgical repair¹⁵ besides having excellent visualization of repair and good clinical outcome.

Conclusion :

Traumatic diaphragmatic hernia may remain asymptomatic or may present with unexplained and unrelated symptoms. The diagnosis requires high clinical suspicion and patient should be advised prompt radiological investigation. Tradition approaches of thoracotomy or laparotomy have been superseded by minimal access approaches of laparoscopy or thoracoscopy. Laparoscopy is an attractive, safe, and efficient approach for repair of haemodynamically stable and chronic traumatic diaphragmatic hernia.

Conflict of Interest : None.

Ethical Issue : None.

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“Life is like a game of cards. The hand you are dealt is determinism; the way you play it is free will.”

— Jawaharlal Nehru

Case Report

Aripiprazole induced Neuroleptic Malignant Syndrome : A Case Report

Soumi Ghosh¹, Indranil Saha², Arijit Mondal³

Neuroleptic Malignant Syndrome (NMS) is a life threatening adverse reaction to antipsychotics. It manifests as disorientation rigidity, fever and autonomic instability. NMS is commonly seen with first generation antipsychotics, and usually uncommon with atypical antipsychotics. A 20 years old female patient with the diagnosis of acute and transient psychotic disorder (ATPD) presented with characteristic features suggestive of NMS, following treatment with tablet aripiprazole 20 mg daily. The patient was diagnosed NMS, offending drug aripiprazole was immediately stopped, and rapid treatment with tablet bromocriptine and supportive care lead to recovery.

[J Indian Med Assoc 2021; 119(4): 59-60]

Key words : Aripiprazole, Neuroleptic malignant syndrome, Acute and transient psychotic disorder.

Neuroleptic malignant syndrome (NMS) is an unpredictable, rare adverse reaction to antipsychotics. Characteristic features of NMS are rigidity, tremor, autonomic instability, fever, mental status change, leukocytosis, and elevated creatine kinase (CPK)¹. NMS is encountered more with first generation antipsychotics (FGA) and is a rarity with second generation antipsychotics (SGA)².

Regarding the etio-pathogenesis of NMS, there are two hypothesis which may occur individually or together. First is Dopamine receptor blockade hypothesis: dopamine plays a important role in hypothalamic thermoregulation. Therefore, typical antipsychotics can cause dys-regulation of the dopamine mediated signalling on thermoregulatory centre by antagonising it³. Second is musculoskeletal fibre toxic hypothesis : it has postulated that massive entry of calcium ion in musculoskeletal fibre is the main factor behind sustained muscle contraction with rigidity and hyperthermia. This is supported by the evidence that dantrolene, which acts by a mechanism that decreases intracellular calcium concentration, is the effective treatment of neuroleptic malignant syndrome⁴.

Here we are dealing with aripiprazole, which is being a atypical antipsychotic, is a partial agonist at dopamine receptors (mainly affinity for D2,D3), ie, it causes signal transduction from the receptor to be in the middle of somewhere between full output to no output (much less than an full agonist). So, according to the hypothesis of dopamine receptor blockade mechanism of NMS, it is quite unlike for atypical antipsychotics like aripiprazole to cause neuroleptic malignant syndrome⁵.

Editor's Comment :

- Neuroleptic Malignant Syndrome (NMS) is a rare fatal side effect of antipsychotic medication commonly with first generation(typical antipsychotics).
- Aripiprazole is a newer atypical antipsychotic which acts by modulation of dopaminergic system in brain.
- The uniqueness of this case report lies on the fact that NMS may occur with aripiprazole (very rarely)which can be explained by rapid dose escalation.

There are very few cases reported on this regarding this in the literature^{6,7}. Here we present a case of NMS caused by aripiprazole in a young female having acute and transient psychotic disorder, thus focussing on NMS with the use of atypical antipsychotic aripiprazole.

CASE REPORT

A 20-year-old female with no significant past, personal and family history with well-adjusted premorbid personality presented with restlessness, aggressiveness, behavioral oddities, self-muttering, self-laughing without any apparent reason, and insomnia for past one week. She attended outpatient department (OPD), and a diagnosis of acute and transient psychotic disorder was made. She was advised aripiprazole 10 mg/day and lorazepam 2 mg/day. 3 days after starting medications, she presented to the OPD as her restlessness and aggressiveness did not subside significantly. Dose was increased to 20 mg of aripiprazole and 3mg of lorazepam daily. Four days later, the patient revisited the OPD with complaint of high fever, stiffness in all four limbs, and mutism. On examination, her consciousness was altered and she did not respond to commands. There was associated fluctuation of blood pressure. She was suspected to develop NMS and admitted. Her serum creatine kinase (CPK) level was 4068.25

IU/L The liver function tests were normal and the total leukocyte count was raised (15,200/mm³) with

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polymorphonuclear leukocytosis. Computed tomography of brain did not reveal any abnormality. Aripiprazole was stopped. Conservative management with Foley's catheterization, intravenous fluid, anti-pyretic, frequent monitoring of vitals and mental status was done. Tablet bromocriptine 5 mg/day in divided doses was started, which was gradually increased to 15 mg/day in divided doses. She also received tablet lorazepam 4 mg/day. After two weeks, the patient started to take food orally, walked on her own and rigidity decreased and had normal body temperature, suggesting significant improvement. Her serum CPK level gradually reduced to 127 IU/L after two weeks. Bromocriptine was slowly tapered down and stopped. On account of some residual psychotic behaviour, she was advised quetiapine 50 mg/day which was gradually escalated to 200 mg/day. She was then discharged in stable condition.

DISCUSSION

Second generation or atypical antipsychotic drugs, also known as Serotonin Dopamine Antagonists (SDA), are widely used for schizophrenia and schizoaffective disorder, mood disorder, dementia, autism spectrum disorder etc. The term atypical is used as these drugs differ in their side effect profile, most notably a lower risk of extra-pyramidal side effects (EPS)⁸.

Aripiprazole is a dopamine (D2) antagonist, but can also act as partial D2 agonist. Partial D2 agonists compete at D2 receptors for endogenous dopamine, thereby producing a functional hypodopaminergic state. The absence of complete D2 blockade would be expected to minimize EPS⁸.

A sharp escalation of antipsychotic dose is assumed to be the responsible for NMS by causing a massive and sudden down-regulation of dopamine receptors. This would be the possible mechanism in this patient too as there was rapid loading of aripiprazole to 20 mg/day. Symptoms subsided after holding the drug and along with supportive management. The causality of this adverse reaction was assessed by the Naranjo's Assessment Scale⁹.

In our patient, there are clinical features and abnormal laboratory test results (serum CPK 4068.25 IU/L and total leucocyte count 15,200/mm³) post exposure to the offending drug. Clinical features of our patient could not be explained on the basis of other disease or drugs. Stopping the drug produced significant clinical improvement. Considering the typical clinical features and laboratory abnormalities of NMS, a re-challenge with the drug was not required.

According the Naranjo's Assessment Scale, the probability score was '8' (probable). The severity of the adverse reaction was determined according to Hartwig

*et al*¹⁰. This was life threatening adverse reaction and led to long hospital stay and required intensive observation and hence can be classified as 'severe'.

With rapid escalation of dose, NMS can occur with atypical antipsychotics such as aripiprazole. We should be more cautious particularly regarding dose adjustment in susceptible patients. A better understanding of this syndrome for prediction, early diagnosis and rapid intervention would be helpful in reducing fatalities.

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Voice of the Expert

Mixopathy

The recent notification on 'Mixopathy' issued by the Central Government has triggered serious controversy among the modern medicine doctors in the country. In an exclusive interview given to the JIMA.

Dr J A Jayalal, National President, IMA has thrown lights on some important issues. Here are some excerpts.

Q. What's your opinion about the notification of CCIM dated :

This is an arbitrary unacceptable move by the Centre deviating from the primary objective of providing better modern medicine treatment to all people in our country.

Q. What Do you mean by 'Mixopathy'?

'Mixopathy', a policy advocated by the National Education Policy (NEP) 2020 and the Four committees of NITI Aayog for officially integrating the systems of medicine in medical education, practice, public health and administration, would ring the death knell of modern medicine system as a whole. All the undergraduate and post graduate degrees in modern medicine would also be abolished.

The purity and identity of Ayurveda would be equally challenged. The policy would have also a major impact on the image of Indian doctors in abroad. Medical tourism would also be affected with drastic fall in number of patients coming to Indian hospitals from foreign countries.

Q. Is there any dearth of Doctors in modern medicine and surgery that prompted the Centre to introduce such an irrational and non-pragmatic move?

India has sufficient number of around 13 lakh doctors and the WHO has also recently excluded our country from the list countries with inadequate number of doctors in modern medicine. Doctors-patients ratio in our country is 1000:1. Unfortunately, job opportunities for graduate doctors are not sufficient because of poor infrastructure in healthcare services in both public and private sectors and dissatisfying salary.

Every year, 86000 medical graduates are coming out from 586 teaching hospitals but all of them don't have jobs.

The Speaker in the Lok Sabha has caught COVID-19 infections. Is he taking treatment of Ayurveda medicine?

Q. What's your view about MS (Ayurveda) surgeons offering services to rural people?

We should not differentiate between patients in rural and urban categories. All patients are equal to us.

It would be a 'mass genocide' if the Ayurveda surgeons offer services to patients belonging to any category. There are around 440 Ayurveda medical colleges in India and most of them are owned by political leaders.

The move to bring 'Mixopathy' is nothing but a plan to increase the market of Ayurveda products. How many Ayurveda doctors have their presence in rural India?

Q. What's the present training pathway for modern medical graduates to become a surgeon or surgical specialist?

It takes eleven and a half years with rigorous study for entrance and semester examinations for different levels of medical courses starting from MBBS, MD/MS to post doctoral DM and MCh while for an Ayurveda



Prof J A Jayalal

MS, FRCS (Glasgow), DLS (Germany), FIAGES, MBA (HA), PhD (Surgery)

National President, IMA

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doctor it takes six and a half years to complete the degrees.

Q. Do you feel 'Mixopathy' will cause any harm to people?

Considering its harmful impact on patients IMA has already called for a non-cooperation movement asking surgeons and anaesthesiologists not to cooperate in training the Ayush doctors in protest against the notification.

Q. What's the role of the IMA to protect people's health?

We are always for the causes of the common people since 1928 when this body was formed. Our objective is not only for doctors but also for the entire community.

Q. CCIM is under the union health ministry. Will you take up the issue with the ministry?

We have already submitted a list to the Union government of 1,500 modern medicine doctors who are willing to serve in any remote areas of the country. This is done to counter the false claim of lack of doctors which is cited as a reason to promote mixopathy.

We have also moved the Supreme Court against the notification. The case has been accepted in the Apex Court.

Recently, the Ayurveda minister met an accident in Goa. Did he rush to any Ayurveda doctor seeking emergency treatment?

The Speaker in the Lok Sabha has caught COVID-19 infections. Is he taking treatment of Ayurveda medicine?

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The move to bring 'Mixopathy' is nothing but a plan to increase the market of Ayurveda products. How many Ayurveda doctors have their presence in rural India?

Q. Which one is your priority? Utilisation of 'Mixopathy' or improvement in infrastructure facilities, increase in GDP allocation for health instead of giving knives and scissors to Ayurveda doctors following the notification?

Our priority would be definitely to increase for GDP allocation in health and infrastructure development with setting up of more medical colleges and hospitals across states and UTs.

Q. Will the move of mixopathy have direct impact on both higher study in medical science and employment generation of young MBBS doctors coming out from 550 medical colleges across the country?

It will have major impact on common people instead of doctors community.

Q. Will the think-tanks of the CCIM notification recommending 'Mixopathy' rush to any 'Ayurvedic surgeons' if they require any major surgery?

You know the answer better than me. Recently, the Ayurveda minister met an accident in Goa. Did he rush to any Ayurveda doctor seeking emergency treatment?

Our priority would be definitely to increase for GDP allocation in health and infrastructure development with setting up of more medical colleges and hospitals across states and UTs.

Prof J A Jayalal, thank you for the valuable insight into 'MIXOPATHY'.

Pictorial CME

Foot Drop as the Initial Presentation of Amyotrophic Lateral Sclerosis

Sumi M Pillai¹, Jayakrishnan MP¹, Tanu Arora¹, Jeyaraj K Malcolm², M Sathish Kumar², Sakthi Velayutham S², PR Sowmini², Viveka Saravanan R³, K Mugundhan⁴

Pseudo polyneuritic ALS mimics motor neuropathy as it is characterized by unilateral foot drop which progresses as the disease advances. In this report we are discussing a case that presented with foot drop. Detailed neurological examination, supported by electrophysiological findings helped us to arrive at the diagnosis of this unique variant of ALS. Pseudopolyneuritic form has a slow progression and better prognosis when compared to other ALS subtypes. Recognition of this form of ALS is important for clinicians because the combination of distal weakness of the lower limb and absence of Ankle jerk usually suggests peripheral neuropathy.

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Amyotrophic lateral sclerosis ALS is defined as adult onset idiopathic progressive degeneration of anterior horn cells and pyramidal tract resulting in progressive muscle weakness, wasting and fasciculations. Patients with pseudo polyneuritic variant of ALS presents with distal weakness and foot drop as the initial manifestation. Hereby we report this case of ALS with foot drop as initial manifestation.

CASE REPORT

58 year old male presented with subacute onset, progressive flaccid weakness of left lower limb, distal more than proximal, associated with thinning of left foot since 1 year. It was followed by weakness of right lower limb after 1 month. Patient also reported muscle twitching over both thighs. He developed weakness of both upper limbs, left followed by right over past 2 months, distal more than proximal, flaccid type associated with thinning and twitching. Higher mental functions were normal. Cranial nerve examination revealed exaggerated gag reflex. Tongue showed atrophy, weakness and fasciculations. Motor examination revealed flaccid weakness of both hands and feet with MRC grade of 4/5 proximally and 1/5 distally associated with wasting and fasciculation. Patient had high steppage gait with bilateral foot drop, right more than left. All deep tendon reflexes were exaggerated except bilateral ankle jerk which were absent. Jaw jerk was brisk with prominent cortical release reflexes. Sensory examination was normal. MRI brain and spine was normal. Nerve

conduction study showed severe motor axonal neuropathy with normal sensory action potentials. Laboratory investigations including Complete blood count, Liver function test, Renal function test, and Thyroid profile were within normal limits. Serum electrophoresis, Urine Bence Jones Proteins and Paraneoplastic work up were negative. Electromyography showed fasciculation and fibrillation potentials with giant polyphasic motor unit action potentials with increased duration and incomplete interference suggestive of neurogenic pattern. Hence diagnosis of Amyotrophic Lateral Sclerosis was made as per modified El Escorial criteria. Patient was initiated on Riluzole and counselled regarding prognosis.



Fig 1 — Patient in sitting position demonstrating bilateral foot dorsiflexion weakness with right foot drop

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¹Resident

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DISCUSSION

Amyotrophic lateral sclerosis (ALS) was first described in 1869. It is frequently referred to as "Lou Gehrig's disease" in memory of the famous baseball player who died of ALS in 1941. ALS is defined as adult-onset, idiopathic, progressive degeneration of anterior horn cells and upper motor neurons resulting in progressive muscle weakness, wasting and fasciculations. The clinical picture varies, depending on the location and progression of the pathologic changes. Diagnostic criteria of the World Federation of Neurology (The "El Escorial criteria") can help define and classify ALS.

The pseudopolyneuritic form of ALS is a subtype of ALS characterised by distal weakness of unilateral lower limb and absence of ankle jerk at disease onset¹. Pathology of this form of ALS is associated with myelinated fiber loss in the corticospinal tract of the thoracic and lumbar spinal cord segments².

The pseudo polyneuritic form of ALS may begin with foot drop in some patients. This form may be confused with some clinical conditions such as lumbar plexopathy,

L5 radiculopathy, peroneal neuropathy and distal myopathy because of the presence of isolated foot drop at presentation. This form of ALS has better prognosis and survival rates than the other subtypes of ALS².

CONCLUSION

This case is reported here to emphasise that Pseudo polyneuritic form of ALS can present with foot drop. In this aspect, it may be misdiagnosed as neuropathy. Therefore, a patient's history, neurologic examination and electrophysiologic evaluation should be assessed carefully for a proper diagnosis.

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Pictorial CME

Giant Cell Tumour of The 1st Metacarpal Bone Salvaged by Fibular Graft

Santanu Banerjee¹

A 45 year male presented with a progressive painful swelling of 18 months duration of Left Thumb. There was no history of trauma and the movement of thumb was grossly restricted. Local examination revealed a diffuse, tender, 5cm x 4.5cm x 4 cm swelling on the Dorso – ventral aspect of the thumb [Fig 1(a)&(b)]. Physical examination showed a tender osseous mass over the left thumb. The Radiograph demonstrated a large expansile lesion involving the entire 1st Metacarpal with thin septae and associated soft tissue mass [Fig 1 (c)&(d)]. Chest Xray and screening laboratory tests were normal. MRI gave D/D of 1. Aneurysmal Bone cyst 2. Extensive Enchondromatous Lesion and 3.Giant cell tumor (GCT). FNAC suggested Benign GCT [Fig 1 (a,b,c,d)].

On surgery, the tumour was found to consist of brown cheesy material and was seen involving the surrounding soft tissue. The tumour was carefully removed along with a cuff of normal tissue and the proximal and distal joints were inspected. The Trapezium was partially eroded. An appropriate size Fibula Graft was taken, inserted into the troughs created in the remaining part of Trapezium and the Proximal Phalanx and fixed with K wire both proximally and distally aiming at fusion [Fig 1 (e),(f)].The Histopathology report suggested giant cell tumour (GCT). At 5 mnths follow up he has satisfactory function of left hand [Fig 2 (a to e)].

Our case is different from those reported because of the involvement of the 1st metacarpal bone which was totally eroded and had subarticular extension.^{1,2} The patient is a poor farmer and the only earner of his family. Salvage by Fibula in this case is innovative and very rare. The fusion was done so that the reconstructed thumb can touch the tip of little finger and



Fig 1 (a), (b) — Shows diffuse swelling on the Dorso ventral aspect of thumb



Fig 1 (c), (d) — Radiograph of hand AP and Oblique view revealed a large expansile lytic lesion involving the entire 1st Metacarpal with soft tissue involvement



Fig 1 (e) — Postoperative Xray AP and Oblique view demonstrating Fibula Graft with K wire Fixation

Fig 1 (f) Follow up xray showing incorporation of graft at 4.5mnths followup

for that the thumb was kept in opposition and DIP joint in 15 degrees flexion. The result and outcome is highly satisfactory .Informed consent was taken from the patient before publication of this clinical case.



Fig 2 (a to f) — At 5 mnths follow up he has satisfactory function of Left Hand

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Dr Pankaj Jindal, MS Orthopaedics, Hand Surgeon.

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Case Discussion in Neurology

Dealing a Patient with Dementia : Some Basic Concepts

Gautam Das¹

It is a common belief that patient with dementia presents with forgetfulness only. Dementia encompasses deficits in multiple domains of cognition. Presently there are very few treatment options for dementia. Few are coming out. Anatomical localisation is the basic requisite for diagnosis. Symptom exploration still is the best way to reach a diagnosis. Details of the deficit as well as the relative strength in different cognitive domains are the cornerstone of dementia classification. Conceptual approach is more needed than specific skill set when obtaining a history. This conceptual framework is needed for eliciting specific information about the patient's cognition, behavior and daily function. Age, handedness, education, occupation is important consideration. Onset, duration, progression and chronology of the symptoms better characterize the dementia. History of other neurological, medical diseases, family history is important as well. Neurological and neuropsychological tests may give important clues. Everyone of us should be very careful using these tools, as often they are overlapping in eliciting results. At the same time, multiple tests are needed frequently to elicit a single domain. Neuroimaging adds to the armamentarium of dementia diagnosis. Needless to say, it is a comprehensive approach to deal cases of dementia.

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Key Words : Cognitive, dementia, domains, neuropsychological, neuroimaging.

Common belief is that dementia means some problem in memory and people complain of forgetfulness. In DSM IV, memory problem is a compulsory criterion for defining dementia. In DSM V, the term "Dementia" has been changed to "Neurocognitive disorders" and memory problem is no more compulsory but one of the criteria. So, dealing a patient with dementia we have to know about the domains of cognition. They are executive function, attention, memory, visuospatial function, language and behavior. Before we go into the details, let's explore some cases.

Case 1 :

A 78-year-old right handed man with 14 years of education was brought into the clinic urgently for assessment of the acute onset of "confusion". He had been evaluated 4 days prior to assess his 2-year history of the insidious onset of progressive anterograde memory loss that affected his usual instrumental activities of daily living. Neuroimaging at that initial visit revealed bilateral hippocampal and parietal atrophy. At the initial visit, he was diagnosed with Alzheimer's disease. He had been well over the intervening 4 days but in the morning, his family noted that he appeared confused and requested an urgent reassessment. His medical history was remarkable

Editor's Comment :

- Symptom elaboration is very crucial, as deficits in most of the other domains usually present as memory deficit erroneously by the patient.
- Deficit as well as the relative strength of the cognitive domain are to be handled with equal importance, as dementia can be characterized best by this approach.
- Conceptual approach is more needed than specific skill set.
- Real life incidences are of more values than results of the tests done in clinics.
- Dementia approach is a comprehensive one encompassing all the neurological, psychological, behavioral symptoms along with necessary neuropsychological tests, imaging.

for hypertension, type 2 diabetes mellitus and hypercholesterolemia.

On cognitive testing, he scored 17/38 on the Short test of Mental status^{1,2}; he had scored 25/38 at the initial evaluation 4 days earlier. The elements of each test and his scores for each area are listed below. His elemental neurologic examination was normal on both visits.

Short Test of Cognitive Domain	Score at initial visit	Score at follow-up visit
Total score	25/38	17/38
Orientation	6/8	5/8
Attention	6/7	4/7
Learning (number of trials)	4/4 (1 trial)	4/4 (2 trials)
Calculations	4/4	0/4
Similarities	2/3	2/3
Construction/drawing	3/4	0/4
Information	4/4	3/4
Delayed recall	0/4	0/4

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Given the acute clinical change and the results of the clinical assessment at the second visit, he was clinically diagnosed with an acute left parietal stroke and sent to the emergency department for urgent neuroimaging. Brain CT revealed an acute left parietal intracerebral hemorrhage.

This case illustrates that cognitive testing can aid with the localization of brain lesions. When comparing the two test results, a marked and focal difference is seen in this patient's ability to perform calculations and draw items, and both functions localize to the left parietal lobe. Given the acute change reported, the clinical conclusion was an acute stroke affecting left parietal lobe.

Conceptual approach is more needed than specific skill set when obtaining a history. This conceptual framework is needed for eliciting specific information about the patient's cognition, behavior, and daily function. History from collateral informant is very important. A patient's cognitive profile includes not only the patient's weakness but also his relative strengths. History from collateral informant is very important to clarify the symptoms, to determine the chronologic progression of the signs and symptoms and to

determine the course of the progression (gradual, fluctuating or stepwise) (Table 1).

Identifying Patient Features : Depending on the age when the first symptom develops, the dementia can be early onset (before age 65) or late onset (age 65 or older). Although not exclusionary, older age of onset likely predicts that a neurodegenerative process is the etiology, while genetic, vascular, or metabolic causes are more often found in younger patients. It is important to note that ischemic cerebrovascular disease is commonly associated with neurodegenerative disorders, such as AD. Handedness is a marker for lateralization of cognitive functions in the brain. In 95% of right-handed patients, language function is lateralized to the left hemisphere. In contrast, 22% of left-handed patients have language centers either in the right hemisphere or both hemispheres. Change in use of preferred hand can imply either weakness or apraxia on the dominant side. Education and occupational history provide information about the patient's premorbid level of intelligence and function. It is also helpful for the interpretation of cognitive test results.

Table 1 — *Comments to Consider by Presenting Symptoms*

First Symptom Noticed	Affected Cognitive Domain	Disorders to consider
Repeats him/herself; rapidly forgets conversation	Anterograde memory loss	Alzheimer's disease
Cannot recall people he/she sees on the street; does not recognize familiar people at a party; cannot recognize his or her own house	Prosopagnosia	Semantic dementia variant of frontotemporal dementia
Cannot align things; has problem seeing, reading, blurry vision; cannot fill out a form; cannot find things in the refrigerator; cannot read a map; misplaces items; gets lost/geographic disorientation	Visuospatial dysfunction	Alzheimer's disease (posterior cortical atrophy variant), dementia with Lewy bodies
Inability to fix things	Apraxia, executive dysfunction, visuospatial dysfunction, attentional dysfunction	Corticobasal syndrome, Alzheimer's disease, dementia with Lewy bodies, vascular cognitive impairment
Forgets words; describes words; talks around them; mixes up words; mispronounces words; forgets what a word means	Language (anomia)	Primary progressive aphasia (nonfluent, logopenic, or semantic variants)
Sometimes able to do things and sometimes appears more confused and cannot do things	Attention (fluctuations)	Dementia with Lewy bodies
Cannot plan, multitask, or stay on task; must do everything in single steps; cannot combine tasks	Executive dysfunction	Alzheimer's disease, vascular cognitive impairment, behavioral variant of frontotemporal dementia (behavioral abnormalities must also be present for this diagnosis), dementia with Lewy bodies

(By David F. Tang-Wai MDCM, FRCPC; Morris Freedman, MD, FRCPC, FAAN.)

Case 2 :

A 55-year-old right-handed man with 17 years of formal education presented with the insidious onset of progressive word-finding difficulties of 3 years in duration. In conversations, he knew that he should know some words, but he had forgotten what they meant. Although he could recognize colleagues, he did not recall their names. He had no change in personality or behavior.

On cognitive testing, he scored 30/38 on the Short Test of Mental Status^{1,2}, with the following breakdown of the subitems: orientation 8/8, attention 5/7, learning 4/4 words in three trials, calculations 4/4, construction/drawing 4/4, information 3/4, and delayed recall 3/4. His elemental neurologic examination was normal.

Additional cognitive testing revealed normal performance on the Rey-Osterrieth Complex Figure Test³ (a test that involves copy and recall of a complex figure and measures several functions, including visuospatial ability, planning, and visual memory), Logical memory subtest of the Wechsler Memory Scale⁴ (a test of memory in which the patient learns and recalls elements of a story), and Rey Auditory Verbal Learning Test⁵ (a test of memory in which the patients learns and recalls a list of unrelated words). However, he obtained 5/30 on the Boston Naming test, generated seven animals for semantic fluency, and generated 25 words on verbal letter fluency (C, F, L).

Brain MRI revealed focal left anterior temporal lobe atrophy. Brain single-photon emission computed tomography (SPECT) revealed left more than right anterior bitemporal hypoperfusion. A diagnosis of semantic variant primary progressive aphasia was made.

This case illustrates the limitation of certain bedside screening tests to adequately evaluate a patient to reach a diagnosis. The patient had scored reasonably well on the Short Test of Mental Status, losing points for difficulties in learning words as additional points are deduced for learning after one trial. This test also does not adequately evaluate language; therefore, additional language tests were administered as language deficits were the patient's presenting symptom. Furthermore, his deficits were clinically localized to the left temporal lobe, which was confirmed on MRI.

It is important to say that, no single test can cover the entire aspect of cognitive domains. On the contrary, there is usually no one to one relationship in a test (that means no single test can measure a single domain only). Therefore, we have to depend on history crucially. We usually try to evaluate the predominant

cognitive domain affected first. At the same time, the spared cognitive domains are evaluated with equal importance. Because both these deficit and strength gives the actual picture. Systematically we explore the cognitive domain involved first, then we ask for the behavioral aspect. Next, we look for any other neurological, medical illness. We search for family, occupational history next.

With this back-up we start clarifying symptoms and the course of the illness. Requisites for this are the information about the onset (insidious or acute), nature of the symptoms, course of the condition (gradually progressive, stepwise, fluctuating, or improving) and duration. Correct assessment of these information leads us nearer to provisional diagnosis and differentials. Like other streams of neurology, our endeavor is to localize anatomically, then pathology of the lesion and lastly the etiology. What is unique in cognitive neurology, anatomical localization is not very concrete. One single anatomical site is responsible for many cognitive domains and multiple sites may involve in a single cognitive processing. The organization of brain adds more complexity. A single cognitive domain has different level of processing depending on different anatomical sites. For example, visual activity in brain starts with occipital cortex subserving the elemental function (brightness, contrast, colour, size etc.). Then gradually, depth, movement perception comes in through different levels of occipital cortex (V1, V2, V3, V4.....V8 etc.). As it proceeds further, ramification of that domains takes place. If it moves to the (ventral path) temporal cortex, particularly the inferior temporal cortex ("Whatpathway") object recognition results. If it moves to the (dorsal path) parietal cortex ("Where pathway") spatial processing results⁶. On top of this different cognitive modalities interact among themselves through association cortex. For these reasons, we are gradually shifting to the "network" concept⁷.

Considering all these complexities and paradigm shift, we still bang on the basic approach. Depending on onset, progression and duration we can deal with the pathology and etiology.

ONSET AND DURATION

Acute (seconds to days) : stroke, infection (viral bacterial), metabolic.

Subacute (weeks to months) : metabolic, infection (Creutzfeldt-Jakob disease, fungal, spirochete)

Chronic (years) : neurodegeneration, chronic cerebrovascular disease

PROGRESSION

Improving : stroke, infection (viral bacterial), metabolic, delirium

Static : stroke (fixed deficit)

Fluctuating : epilepsy, paraneoplastic, metabolic, dementia with Lewy bodies (DLB).

One of the important aspects of dementia diagnosis is to explore the chronology of symptom appearance. Memory, executive dysfunction, language, behavior all are affected in both Alzheimer's disease (AD) and behavioral variant of frontotemporal dementia (bV-FTD), but the sequence is different. Certain Neurodegenerative syndromes may evolve to incorporate other distinct clinical syndrome, and this is being reflected in revised diagnostic criteria.^{8, 9} For example, patients presenting with progressive non-fluent aphasia (PNAFA) can progress over time to develop corticobasal syndrome (CBD), progressive supranuclear palsy (PSP), or bV-FTD⁸.

In AD the usual sequence of affected domain is: memory, executive function, language, visuospatial and lastly behavior.

In bV-FTD the usual sequence of affected domain is: behavior, executive

function, language and lastly memory.

The chronologic approach can also determine if differing pathologies are developing in the same person. It has been reported that the patient develop the core features of DLB after developing typical AD many years earlier.^{10, 11}

The ability of the patients to perform their activities for daily living (ADL) [grooming, managing hygiene, bathing, eating, dressing etc.] should be determined. Changes in the basic ADLs range from fully independent to needing reminders, requiring help, and fully dependent.

Major deficit seen on testing	Pattern	Example conditions
Orientation, delayed word recall	Amnesic	Mild cognitive impairment (amnestic) [MCI], Alzheimer's disease.
Planning and monitoring, attention, sequencing (eg. Three-step command) word list generation for letters	Executive dysfunction, frontal-subcortical dysfunction	Dementia with Lewy bodies (DLB), Parkinson disease dementia, vascular dementia.
Drawing	Visuospatial impairment	Posterior cortical atrophy (PCA), DLB, corticobasal syndrome (CBD).
Naming, repetition, writing	Aphasia	Primary progressive aphasia.
Normal testing	Not applicable	Can be seen in bV-FTD, subjective cognitive impairment.

Examination element	Examination finding	Disorders to consider
Extra ocular movements	Initiation of saccades (indicates an ocular apraxia): PCA, CBD. Slow saccade velocity: PSP. Limitation of extra ocular movement: PSP	CBD, PSP, PCA.
Upper motor neuron signs	Pyramidal distribution weakness (weakness pattern in arms: extensors >flexors; in legs: flexors >extensors), hyperreflexia, extensor plantar response.	Stroke, CBD, intracranial mass lesion.
Assessment for parkinsonism	Bradykinesia, bradiphenia, masked facies, limitations/absence of downgaze: PSP. Rigidity with or without cogwheeling [distinguish between axial (PSP) versus appendicular (Parkinson's disease [PD], DLB, CBD) rigidity], rest tremor (not typically seen in DLB, PSP, CBD); fatiguing (rapid alternating movements eg. Finger tapping, opening/closing hands, festinating gait, progressive hypophonic speech); early postural instability: PSP.	Parkinson disease with dementia (PDD), DLB, CBD, PSP, Stroke.
Assessment for early focal cortical dysfunction	Balint syndrome (some or all components): simultanagnosia [inability to see objects simultaneously]; optic ataxia (inability to reach a target under visual guidance); ocular apraxia (inability to move the eyes to a target purposefully). Gerstmann syndrome (some or all components): right-left disorientation, finger agnosia, acalculia, dysgraphia Dressing apraxia Ideomotor apraxia Language (anomia)	PCA, CBD (bilateral parietooccipital area lesion) PCA, CBD, Logopenic progressive aphasia. (Inferior parietal lobule, Angular gyrus) PCA, Corticobasal syndrome (CBS). CBS, AD. Primary progressive aphasia (PPA).

(By David F. Tang-Wai MDCM, FRCPC; Morris Freedman, MD, FRCPC, FAAN.)

We have to keep it in mind that, first we have to ascertain the true cause of the symptom or functional decline. Suppose a patient who is no longer able to use a mobile phone could be demonstrating difficulty with executive function (affecting task setting and monitoring to track the appropriate steps), visuospatial deficit (to recognize the mobile itself or its parts), language impairment (deficit in the meaning of the number engraved in the mobile), apraxia (problem I organizing or sequencing of movements) or simply physical weakness. A combination may play role.

Medication history, medical and neurological past history that could affect cognition like endocrinopathies, chronic organ failure, and chronic neurologic disorders like Parkinson disease, stroke, epilepsy, multiple sclerosis (MS) should be noted. A history of concussion or traumatic brain injury (TBI), confusion following recent surgeries, alcohol, smoking, and illicit drug use should be sought for.

A few words about the cognitive tests must be included here.

Lastly, to discuss something about neurologic examination findings in neurodegenerative disorders, the following table would help.

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The post-operative fart is music to the surgeon's ears.

— **Moshe Schein**

Special Correspondence

*[We are publishing this Special Correspondence to commemotare
World Health Day on 7th April]*

World Health Day 2021 : Another Wake-up Call for Health Equity

Rajib Dasgupta¹

The World Health Day theme for 2021 is: "Building a fairer, healthier world".¹ It is with good reason that this has been chosen as the theme as we continue to witness the ravaging effects of the COVID-19 pandemic. The overwhelming concern around health equity is on account of the fact that while COVID-19 has left no country untouched, it disproportionately affected communities with pre-existing vulnerabilities who faced greater exposure to the risk factors of the disease, were far less likely to have access to quality health care services and worse, more likely to suffer adverse consequences as a result of control measures. The WHO reminds us that this is not just unfair, but preventable.

What Is Health Equity, and Why It Matters :

Health inequality reflects the disparity in access to promotional, preventive, curative, or palliative health services or differences in outcomes including disability, morbidity, and mortality spanning physical, mental, and social health.² However, health inequities, caused by a set of diverse socio-economic determinants, are conditions that are unnecessary, unfair, unjust and avoidable.^{3,4} The WHO advocates for the availability of fair opportunity to everyone to attain their full health potential.

Inequality signifies variations and disparities in the health achievements by groups and individuals; it is thus a descriptive term and does not imply any moral judgment.⁵ The difference between health equity and inequality is premised upon the normative judgment of one's theories of justice, society and reasoning for the underlying causes of inequality.⁵ The complex system operating at global, national and local levels

influences the ways in which societies embody different forms of social position and social hierarchy.⁶ Addressing the social determinants of health and empowering individuals, communities and countries was a core imperative of the COVID-19 response – at national, state and local levels.

Learning from COVID-19 Related Inequities :

The key pathways that influenced COVID-19 related inequity included access to information, basic amenities, health service and social and financial protection which impact adherence to behavioral interventions, health care seeking and coping with the disease and resultant socio-economic disruptions. These are the entry points for mitigation measures. Inequities in health cannot be addressed effectively during public health emergencies (such as a pandemic) if these are not addressed on a continuous basis; while efforts and resources can be stepped up during an emergency, mechanisms and platforms for addressing equity are difficult to set up during emergencies.

Addressing equity ought to be an integral part of national health strategies at all times and entails implementing universal access to health services within the universal human rights framework. It is imperative to ensure that all persons are counted and identified using non-discriminatory mechanisms and offered adequate social and financial protection. The pandemic has underscored the importance of identification of health-related vulnerable groups in the population and instituting group-specific interventions; health informatics clearly has a key role to play. Two priorities thus emerge: (i) including equity considerations and addressing needs of vulnerable groups in standard operating procedures and training programs of all rapid response stakeholders; and (ii) decentralization of planning processes of emergency responses at district /municipal/local self-government levels to contextualize equity-promoting strategies.

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Countries and states with robust governance frameworks have in general managed to both control the transmission of infection and keep mortality low. Some of the key enablers are (i) creating frameworks for greater community oversight and involvement in service management, procurement and distribution of all health-related interventions; (ii) expanding outreach services to provide home and community-based care through the deployment of extension workers; (iii) sensitizing care providers to diversity issues and promoting responsive and respectful services; and (iv) formalizing social audits and oversight committees.

One of the three cardinal recommendations of the Final Report of the WHO Committee on Social Determinants of Health (CSDH) is about measuring the problem and evaluating the interventions.⁷ Lessons from the pandemic point to the need for rapid appraisals to identify existing equity gaps and assess needs with regard to the vulnerable groups and, repeating these at regular intervals. Group-specific studies play a key role in unraveling pathways to inequities and coverage as well as effectiveness of mitigation measures. At the same time, citizen science through public participation and collaboration in data monitoring efforts remains grossly under-addressed and has important contributions to make both in emergency settings as well as long-term needs.

This year's theme reiterates the CSDH's articulation of working towards a fairer, healthier world. The CSDH report unequivocally stated that social justice is a matter of life and deaths, affecting the way people live, their consequent chances of illness and their risk of premature death – the pandemic bears

ample testimony to this. The Commission was set up in 2005, in the spirit of social justice – “to marshal the evidence on what can be done to promote health equity, and to foster a global movement to achieve it”.⁷ Presenting a compelling body of research and evidence, it called upon all governments to act on the social determinants of health with the aim of achieving health equity. COVID-19 exposed the gaps that the world has not succeeded addressing in the intervening decade, or worse not bothered enough. “Social injustice is killing people on grand scale”, the CSDH had chillingly stated;⁷ this year's theme is a grim reminder of this message— let us take it up as an ethical imperative.

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Image in Medicine

Bhoomi Angirish¹, Bhavin Jankharia²

Quiz 1

CT scan image of the chest of a 25 year old male presenting with cough and fever since 1 month.

Questions :

- (1) What is the pattern of distribution of nodules ?
- (2) What is the diagnosis ?
- (3) What are the different patterns of distribution of nodules ?

Answers :

- (1) The nodules show random distribution pattern.
- (2) Multiple 2-3 mm sized diffusely distributed nodules are seen. Findings are in favour of miliary tuberculosis.
- (3) The distribution of nodules on HRCT can be placed into one of the three categories: Perilymphatic, centrilobular or random.

In **perilymphatic distribution**, the nodules are seen along pleural surfaces, interlobular septa and peribronchovascular interstitium. It is most commonly seen in sarcoidosis. It can also occur in silicosis, coal-worker's pneumoconiosis and lymphangitic spread of carcinoma.

In **centrilobular distribution**, the nodules spare the pleural surfaces. It is seen in diseases that enter the lungs through the airways such as hypersensitivity pneumonitis, respiratory bronchiolitis, endobronchial spread of tuberculosis.

In **random distribution** pattern, the nodules are randomly distributed relative to secondary lobule. It is seen in miliary tuberculosis, hematogenous metastases, langerhans cell histiocytosis.



Quiz 2

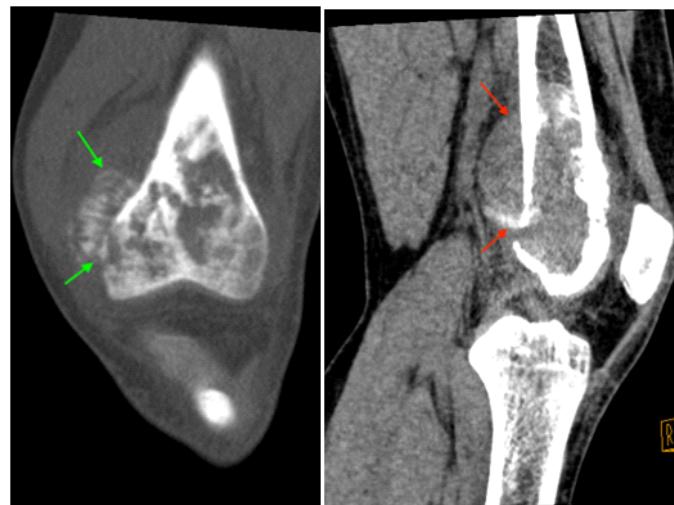
A 18 year old male presented with painless swelling involving lower end of femur since 3 months.

Questions:

- (1) What is the diagnosis ?
- (2) What are the common locations of this lesion ?
- (3) What are the types of osteosarcoma by anatomic relationship to the bone ?

Answers :

(1) An osteolytic lesion with wide zone of transition, showing permeative bone destruction and sunburst type periosteal reaction (green arrow) is seen involving distal meta-diaphysis of femur. Associated soft tissue component (red arrow) is seen. These imaging findings favour diagnosis of osteogenic sarcoma , which was confirmed on biopsy.



(2) Primary osteosarcomas occur at the metadiaphysis of long bones. The commonly involved locations are distal femur, proximal tibia, humerus.

(3) Primary osteosarcoma can be categorized as intramedullary and surface lesions. Intramedullary lesions include conventional , low-grade central and telangiectatic osteosarcoma. Surface lesions include parosteal, periosteal and high-grade surface osteosarcoma.

Student's Corner

Become a Sherlock Holmes in ECG

M Chenniappan¹

Series 4 :

"Looks Similar but not Similar"

This is the routine ECG of 78 years old patient with no specific complaints.

Questions :

- (1) **Describe ECG changes**
- (2) **Why is this clue?**
- (3) **What are practical implications?**

ECG Findings:

ECG shows basic sinus rhythm with frequent ventricular ectopic beats. Sinus beat shows Left Anterior Fascicular block (LAFB- terminal r in aVR). These ventricular ectopic beats have pattern of Right Bundle Branch Block (RBBB) and LAFB indicating the site of origin is Left Posterior Fascicle (LPF). These are not escape beats as they come before the next expected sinus beat ;you can see the non-conducted sinus P in ST segment of first VPD. These ventricular ectopics also occur in couplets with long R-R intervals. Usually in this ECG the common diagnosis is likely to be frequent ventricular "extra" systoles with couplets with long inter ectopic intervals. The usual couplets of ventricular extra systoles commonly have very short inter ectopic interval. There are some peculiar findings of these ventricular ectopics:

- (a) As mentioned above couplets with long inter ectopic interval
- (b) The longest inter ectopic interval is the multiple of shorter inter ectopic interval (shorter inter ectopic interval between second and third beats – 16 small squares ; The longest inter ectopic interval between third and fifth beats – 48 small squares)
- (c) There is slight variation in coupling interval especially the last sinus beat-ventricular ectopic coupling interval.

These findings are suggestive of "para " systoles rather than "extra" systoles.

The differences between Ventricular extra systoles and

Para systoles are shown in Table 1 ,105:

Table 1	
Ventricular extra systole	Ventricular para systoles
Other than sinus	Alongside sinus
Constant coupling interval	Varying coupling interval
Couples with short RR interval	Couplets with long RR interval
No entrance and exit block	Entrance and exit blocks are present
No relation between shortest inter ectopic interval and longest inter ectopic interval	Longest inter ectopic interval is the multiple of shortest inter ectopic interval
Fusion beats are rare	Fusion beats are frequent

The Clue :

The ventricular ectopics in this ECG look similar to ventricular extra systoles but as explained above they are not ventricular extra systoles but ventricular para systoles , that is why the clue of "Looks similar but not similar" is given. The 3 classical ECG findings are shown in Fig.1,105.

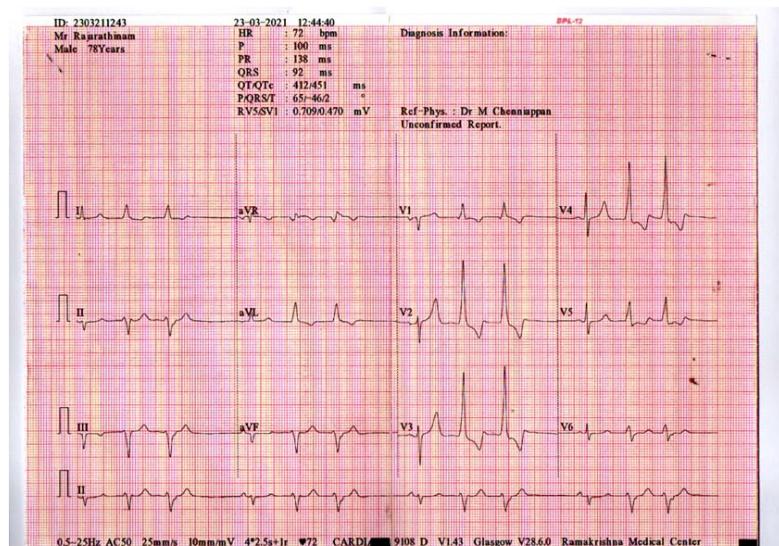


Fig 1

Practical Implications :

As para systoles have entrance block it is difficult to control them because anti arrhythmic drugs may not be able to penetrate entrance block and suppress it. Because of exit block the real frequency of para systoles is under estimated. The underestimation is due to the continuous impulse production from the para systolic focus which is not seen in ECG because of exit block. These two findings of para systoles make it more dangerous than ventricular extra systoles.

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Perspective

Chronotherapeutics — The Need to Listen to Nature's Rhythm

Nandini Chatterjee¹

The concept of chronopharmacology is not new¹ but its use in day to day practice is suboptimal even though awareness about the circadian rhythm and its clinical ramifications has gained momentum.

Circadian rhythm is a system of 24 hour oscillations of the bodily functions in conjunction to the solar day. It controls sleep/wake cycles, food intake, body temperature, neurohumoral as well all metabolic processes. Day and night as well as the sleep/wake cycle has profound effect on the physiology of the organ systems of our body by causing fluctuations in hormones and neurotransmitters. Similarly disease symptomatology varies at various times of the day. Diseases, such as hypertension, asthma, coronary syndromes, peptic ulcer, arthritis, etc, follow the body's circadian rhythm.

For example, there is a physiologic fluctuation in BP which peaks at around 21 hours and dips to minimum at night during sleep (SBP by 3-6 mm Hg DBP by 2-3 mmHg).

It has also been observed that acute myocardial infarction, sudden cardiac death and syncopes are more common in early mornings probably due to increased glucocorticoid levels and increased tendency of platelet aggregation in the mornings.

Hypothalamic nuclei maintain a daily rhythmic fluctuation in corticotrophin releasing hormone and AVP which in turn controls ACTH and cortisol levels in the daytime. Cortisol levels peak in the morning to prepare the body for activity and feeding.

Insulin secretion and sensitivity is lowest between 3-5 am leading to early morning hyperglycemia (Dawn Phenomenon). The Somogyi phenomenon is found in diabetics on insulin where there is hypoglycaemia in the late evening/night due to increased sensitivity and early morning hyperglycemia due to counter regulatory hormone action. The solution is to decrease night insulin dose.

Osteoarthritis worsens during the day and is most troublesome in the evenings but for people with rheumatoid arthritis, the pain usually peaks in the morning and decreases as the day progresses.

Observing such rhythmic patterns, the science of

chronopharmacology which includes chropharmacokinetics and dynamics, has evolved.

Chronopharmacokinetics involves the study of temporal changes in drug absorption, distribution, metabolism and excretion with respect to time of administration. in order to optimise therapeutic outcomes and minimise side effects².

Chronodynamics refers to dosing time, i.e., rhythm-dependent, differences in the effects of medications. Such administration- time differences are due to rhythms in the free-to-bound drug fraction, number and conformation of drug-specific receptors, ion channel dynamics, and rate limiting step(s) in metabolic pathways. Both the beneficial and adverse effects of medications can vary significantly according to their administration time³.

Here are some instances involving different organ systems and their diseases where circadian biology may be used to our advantage

Gastrointestinal System :

Gastric acid secretion is highest at night. Chronotherapy of peptic ulcers with **evening once daily dosing of H2 receptor antagonist is an effective measure⁴**.

Differences in chronopharmacokinetic profiles between Propranolol, a lipophilic α -blocker, and Atenolol, a hydrophilic β -blocker, in patients with hypertension showed that Propranolol, but not Atenolol, is absorbed more rapidly after morning administration compared with evening administration. This confirms that the absorption rate of a lipophilic, but not a hydrophilic, drug is faster after the morning dosage in humans.

Cardiovascular System :

BP is at its nadir during the sleep cycle and rises steeply during early morning awakening period but nightly dip is lost or reversed at times. **ACE inhibitors given at night ensures night time dip and controls early morning rise. Statins are to be given in the evening before bedtime as cholesterol synthesis peaks in the early morning** and this may produce better LDL reduction

Joints :

For **osteo arthritis, painkillers are best given in the noon**. The same drug will be effective when taken after the evening meal for rheumatoid arthritis. In severe **morning**

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symptoms of Rheumatoid arthritis, steroid works better as a night time release formulation.

Lungs :

A normal lung function undergoes circadian changes and reaches a low point in the early morning hours. Chronotherapy for asthma is aimed at getting maximal effect from bronchodilator medications during early morning hours. Ex: **Theophylline preparation taken once a day in the evening so that blood level reaches peak in early morning⁵.**

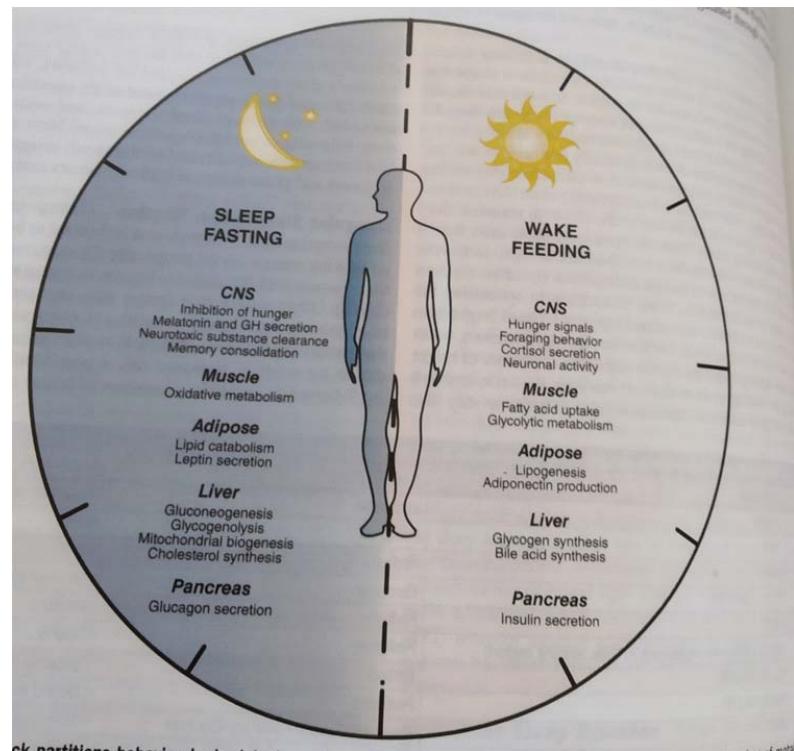
Cancer :

Chronobiological cycles for normal cells and tumour cells may be different. Cancer drugs should be timed to cycles of tumour cells making them more effective against cancer and less toxic to normal tissues. Blood flow to tumours and tumour growth rate are greater during activity phase than rest phase.

5-Fluorouracil works best at night in colon carcinoma as the malignant cells are more susceptible at that time. This displays the phenomenon of Chronoesthesia, which is the circadian change in the susceptibility of any biosystem to a drug (including organ systems, tumors) parasites, etc. **Doxorubicin is less toxic in the early morning as WBC recover faster.**

If symptoms of a disease display circadian variation, drug release should also vary over time. Variations, both in a disease state and in drug plasma concentration need to be taken into consideration in developing drug delivery systems with adequate dose at appropriate time. Various technologies such as time-controlled, pulsed, triggered and programmed drug delivery devices are coming up⁶.

To conclude, chronobiology is a vast subject hitherto untapped to its full potential. Not only medications but the concepts of chronoexercise and chrono diet are catching



up. It is important to sensitize the medical fraternity to the benefits of this branch of medicine by broadening the horizon of our collective consciousness.

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Mediquiz - 04 / 2021**Gynecology****Lahori Roy,***MBBS, MS, DNB, MRCOG, Consultant Gynecologist & Laparoscopic Surgeon, ILS Hospital*

(1) A 27-year-old nulliparous woman undergoes surgical management of a tubal ectopic pregnancy. At laparoscopy, the contralateral tube is examined and noted to be damaged. The woman has strongly expressed her concern about future fertility.

Which is the single best management option?

- (a) Bilateral salpingectomy
- (b) Bilateral salpingotomy
- (c) Medical management of ectopic pregnancy
- (d) Salpingectomy with conservation of contralateral tube
- (e) Salpingotomy with conservation of contralateral tube

(2) A 29-year-old woman attends the Early Pregnancy Unit at 7 weeks of gestation with mild lower abdominal pain that settles with analgesia and moderate bleeding vaginally. Abdominal and vaginal examination is normal and a urine pregnancy test is positive. A transvaginal scan shows no intrauterine gestational sac, both ovaries appear normal and there is no free fluid in the pouch of Douglas.

What is the most appropriate management?

- (a) Diagnose complete miscarriage and advise to repeat pregnancy test in 10 days
- (b) Diagnostic laparoscopy
- (c) Inpatient admission for observation with monitoring of serum β hCG
- (d) Outpatient management with monitoring of β hCG
- (e) Repeat ultrasound in 7 days

(3) A 32-year-old primiparous woman presents to the emergency department with sudden onset of lower abdominal pain, mainly localised in the right iliac fossa. The pain is sharp in nature and is radiating to the right flank. Her last menstrual period was 8 weeks ago. A urine pregnancy test is positive. On transvaginal scan the right adnexa was seen to contain an ectopic pregnancy measuring 25 mm x 17 mm x 12 mm with cardiac activity and an absent haemoperitoneum. Vital signs on arrival are:

- Blood Pressure = 138/68 Mmhg
- Pulse = 82 Beats/Min
- Temperature = 36.5°C
- Respiratory Rate = 18
- Hcg Level = 6000 IU/L

What is the treatment of choice for this woman?

- (a) Expectant management
- (b) Methotrexate regimen
- (c) Laparoscopic right salpingectomy
- (d) Laparoscopic right salpingotomy
- (e) Laparotomy and right salpingectomy

(4) A 27-year-old P0 woman at 7 weeks of gestation presents to the emergency department with a 3 week history of brown vaginal discharge. On transvaginal scan, the left adnexa is seen to contain an ectopic pregnancy measuring 22 mm x 12 mm x 10 mm with absent fluid in the pouch of Douglas. Vital signs on arrival were:

- Blood Pressure = 128/68 Mmhg
- Pulse = 82 Beats/Min
- Temperature = 36.5°C
- Respiratory Rate = 16.

Vaginal Examination Is Negative For Cervical Excitation. On her recent blood tests serum β HCG was 727 ui/l.

What is the treatment of choice for this woman?

- Conservative management with serial β hCG tests until levels falls below 20
- Laparoscopic left salpingectomy
- Laparoscopic left salpingotomy
- Laparotomy and left salpingectomy

(5) A 26-year-old woman experiences bleeding at 6 weeks of gestation and attends the Early Pregnancy Unit for a scan. On transvaginal ultrasound there is a gestational sac containing a fetal pole with a CRL of 6.2 mm without a fetal heart.

What is the next step in your management?

- (a) Arrange a follow up in <7 days for a repeat ultrasound before making a final diagnosis
- (b) Arrange a follow up in >7 days for a repeat ultrasound before making a final diagnosis
- (c) Ask a colleague for a second opinion before giving the final diagnosis
- (d) Discuss surgical management of miscarriage and book for the woman for surgery in the next available slot
- (e) Inform the woman that she had a miscarriage and discuss management options of miscarriage

(6) A 33-year-old G3P0 presents at 7 weeks of gestation to the Early Pregnancy Unit for an early scan. She has previously had one miscarriage at 8 weeks of gestation that was managed expectantly, and one ectopic pregnancy that was managed by

Special Article

END TB by 2025: Way forward to Achieve this Mission while Recovering from the COVID-19 Pandemic

Surya Kant¹

The COVID-19 disease caused by the novel corona virus, severe acute respiratory syndrome corona virus 2 (SARS-CoV2), has upset the major public health care system throughout the world. Originating from Wuhan, China, it was declared as a health emergency by WHO on 30th January 2020. It quickly spread around the globe in more than 200 countries and was declared a 'pandemic' on 30th March 2020. By February 2021, there have been more than 11 crore cases and 25 lakh deaths worldwide, as reported to WHO.¹

On 30 January 2020, India reported its first case of COVID-19 in Thrissur, Kerala.² On 12 March, a 76-year-old man, with a travel history to Saudi Arabia, became the first COVID-19 fatality of India. As it steadily began to wreak havoc throughout the country, the Government of India banned international flights from 22nd March 2020. The country took several measures to contain the spread of pandemic which includes lock-down of the entire country for nearly forty days from 25th March to 31st May 2020.

Apart from preventive measures to contain the spread of the virus, the Government of India also took several measures for public involvement and boosting the morale of healthcare workers throughout the country. Before implementing the full lockdown, the Prime Minister announced a 14 hour 'Junta Curfew' on 19th March 2020. At 5 pm that day, all citizens were asked to stand in their doorways, balconies, or windows, and clap their hands or ring their bells in appreciation for the professionals delivering essential services. In the following days, the media was persistently broadcasting messages regarding public awareness and the importance of healthcare services. Flowers were showered over hospitals by helicopters in several cities. Again, on 5 April, citizens all over India cheered and showed solidarity with the health

workers, police, and all those fighting the disease by switching off the electric lights at home lighting diyas, candles or flashlights, and spread awareness regarding prevention. After a rising trend for several months, the daily new cases finally started showing a downward trend from the middle of September. To re-enforce the practices of mask wearing and social distancing, the Government announced a 'Jan Andolan' against COVID 19, with the aim to involve and motivate the masses to stop the spread of COVID 19. The message- 'jab tak davai nahi, tab tak dhilai nahi' was broadcasted. On 16th January, the Government approved 2 vaccines against COVID 19, kickstarting the vaccination programme against COVID 19. By the end of February 2021, the disease has infected more than 1.1 crore and killed more than 1.5 lakh people throughout the country.

Before COVID-19 became a global pandemic, India was dealing with another, much older epidemic—tuberculosis (TB)—which affected 26.4 lakh Indians in 2019 and killed nearly 4,50,000 people in the country. That is over 1000 TB deaths every single day, well before COVID-19 entered the picture.¹ In fact, no country has a higher TB burden than India, which accounts for a quarter of the 1 crore global TB cases and 14 lakh TB deaths each year.³

Tuberculosis has been infecting humans for at least 35,000 years, probably closer to 2.6 million or even 3 million years. Previously it has been considered to have an animal origin, but recent studies using molecular genetics now suggest that human TB predated that in other animals, including cattle. Tuberculosis is referenced in ancient texts from all over the globe, including the *Rig Vedadating* around 1550 BC. It was termed as 'phthisis' in Hippocrates in Book 1, Of the Epidemics (410-400 BCE). On March 24, 1882, Dr. Robert Koch announced the discovery of *Mycobacterium tuberculosis*, the bacteria that causes. In 1839 JL Schonlein suggested that the word "Tuberculosis" be used as a generic name for all the manifestations of phthisis. A century later, March 24 was designated World TB Day.⁴

Until the advent of chemotherapy, treatment for TB was limited to warmth, rest, fresh air and nutrition.

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The history of TB drugs starts around 1940 with the development of para-amino salicylic acid (PAS) and streptomycin in 1944. However, after the development of the rifamycins in the 1950s, no new drugs were to become available for the next fifty years, until delaminid and bedaquiline became available in 2012.⁴

On 13th March 2018, the Prime Minister of India set for the country an ambitious goal of Ending TB by 2025, 5 years ahead of the Global target. The aim was to end the TB epidemic, with targets to reduce TB deaths by 95% and to cut new cases by 90% compared to that was in 2015; and to ensure that no family is burdened with catastrophic expenses due to TB. To achieve these goals, the RNTCP, India developed the National Strategic Plan (NSP) 2017-2025. The notification of tuberculosis cases was fortified by means of a Gazette Notification on 16th March 2020 (published 19th March 2020), which criminalised the failure to notify cases, carrying an imprisonment of 6 months to 2 years, or a financial penalty or both. To boost notification, financial incentives were announced for private doctors and informants. Active Case Finding was made a priority, and mobile medical vans were utilised in remote and tribal areas where conventional establishments were not possible. As malnutrition is associated with a higher risk and morbidity of tuberculosis^{5,6,7}, a nutritional support scheme- 'The Nikshay Poshan Yojana' was launched in April 2018, which provided every patient Rs.500 monthly till the completion of treatment. Different choices for Information and Communication Technologies (ICT) were used for adherence support, such as Real Time-Medication Event Reminder Monitor (RT-MERM), 99DOTS and automatic pill counters were utilised.⁸ In September 2019, the Union Minister for Health and Family Welfare launched the '*TB Harega Desh Jeetega Campaign*', to boost community participation, along with the National TB Prevalence Survey. The 4 pillars of the programme were modified from Detect-Treat-Prevent-Build to Build-Prevent-Detect-Treat, to emphasise the task of augmentation and capacity building of infrastructure and manpower related to the programme. As a result of these efforts, the notification rates steadily increased till 2019, with the number of 'missing cases' decreased from 10 lakh in 2017 to 2.9 lakh in 2019.⁶ In January 2020 the RNTCP was renamed as the National Tuberculosis Elimination Program (NTEP). A revised draft NSP 2020-2025 is under preparation to enhance these strategies.⁹ The COVID-19 pandemic has disturbed the balance jeopardizing various TB control activities working in full swing and despite political commitments at the

highest level.¹⁰

The COVID 19 pandemic placed unprecedented demands and pressure on the health system.¹¹ Health facilities and workforce are diverted and assigned a wide variety of activities related to controlling the outbreak. While the public health system was collapsing under the stress of the growing COVID-19 caseload, the private healthcare system became expensive and challenging to access.

When India went into a stringent lockdown, anecdotal evidence suggested that citizens were having difficulty accessing routine health services. A large part of the health resources had to be diverted in identifying and containing COVID-19 cases. Many hospitals were designated as 'COVID-19 only', and others restricted non-COVID services for fear of outbreaks. It was seen that seeking healthcare was deferred because of social/physical distancing requirements or community reluctance owing to perceptions that health facilities may be infected.¹² Despite efforts by the authorities, there were severe shortages of drugs, ventilators and personal protective equipment, especially in the initial months of the pandemic. More than 700 doctors were martyred in the fight against COVID-19^{13,14}. In the later months of the pandemic, drugs such as ivermectin were used for prophylaxis¹⁵ and treatment of mild to moderate cases of COVID 19.^{16,17}

As such, all the essential services provided by National Health programmes had come to a record low levels. The country being one of the highest tuberculosis burdens globally had committed to eliminate TB by 2025. A potentially serious setback was caused by COVID pandemic on the ongoing TB control activities across the country. The routine programmatic activities like case-finding, initiation of treatment, follow-up and contact tracing were worst affected. The stigma around TB is well recognised. Stigma around COVID-19 also emerged as a concern in 2020. People were hesitant to get tested for the fear of being tagged or quarantined. And because TB and COVID-19 have similar symptoms (cough and fever), stigma delayed the diagnosis of both conditions.

A mathematical model was developed by the STOP-TB partnership, which predicted that that a 3-month lockdown and a protracted 10-month restoration could lead to an additional 63 lakh cases of TB between 2020 and 2025 globally, and an additional 14 lakh TB deaths during this time. The impact of the same on India was estimated to be an additional 18 lakh cases and an additional 5 lakh deaths due to TB. The global TB incidence and deaths in 2021 was estimated to increase to levels last seen in 2013 and 2016

respectively, implying a setback of at least 5 to 8 years in the fight against TB, due to the COVID-19 pandemic.¹⁹

There were a total 24,01,585 TB cases reported on the national online TB surveillance system- Nikshay portal in 2019, following a steady increase over the past few years. At the beginning of the lockdown, weekly counts of reported cases already dropped by 75% in the three weeks following 22 March (average 11, 367 weekly cases), the date of a strict national lockdown implementation, compared to an average of 45,875 weekly cases during the previous weeks of 2020. This drop was at least partly attributable to a combination of factors including delays in entering the data onto the real-time national online TB surveillance system Nikshay, reduced attendance to health services and reassignment of health personal. The notification rate did subsequently rise in the later months of 2020, leading to a total of 18,08,919 notified cases in 2020, achieving less than 60% of the target notification and a drop of around 25% compared to the previous year.¹⁹ While the data regarding mortality trends in 2020 is not yet available, it may be speculated that factors such as increased mask usage, physical distancing, practice of respiratory hygiene and decreased public movement of infective cases of tuberculosis may have helped in reducing transmission and mortality due to TB in 2020.

In September 2020, the National TB Elimination Programme (NTEP) announced a Rapid Response Plan to mitigate the impact of COVID-19 Pandemic on TB Epidemic and NTEP activities, including a bi-directional TB-Covid-19 screening,²⁰ intensified case finding, replacement of sputum smears with rapid molecular testing, home-based sample collection and delivery of TB medicines, and modification of the DOTS approach to include digital adherence technologies, call centres and family members to provide treatment support.

The first priority should be catching-up on all the missed patients with TB who were missed during the pandemic.²¹ There are several innovative apps now available for real-time geospatial tracking of COVID 19 cases, and similar ones could be developed for tuberculosis.²²

Even as existing molecular technologies such as GeneXpert and TrueNAAT are being repurposed for COVID-19 testing, the NTEP must continue the using these for tuberculosis testing as these tests are critical for early detection of drug-resistant TB.²³

Because administration of injectable TB drugs can be challenging during the pandemic, it is important to adopt the WHO-recommended all-oral, shorter drug

regimens for drug-resistant TB. It is also important to increase BCG vaccination coverage and catch up on all the missed BCG and other vaccinations during the past year¹⁰

The grim situation though has a silver lining to it. The COVID-19 pandemic could help reduce the number of pulmonary TB patients as well, due to multiple factors. The worldwide movement against COVID 19 has led to a widespread usage of face masks and coverings in public as well as in closed spaces. The size of *Mycobacterium* is much larger than the Sars-Cov2 virus, and its transmission is possibly more efficiently prevented by face masks, provided they are used correctly. The practice of physical distancing will help in the reduction of TB transmission as well. A strict enforcement of lockdown and restricted public movement likely helped in the reduction of transmission of not only COVID 19 but TB as well. Greater use of such infection control measures can help further reduce TB transmission. Alternative arrangements to reduce visits for TB follow-up, precautions for sputum collection, transportation and testing should be prioritized. Existing recommendations for infection prevention and control for TB and for COVID-19 should be strictly implemented, including availability of personal protection equipment.

There are now digital X-rays being developed with artificial-intelligence technologies that can rapidly screen for both TB and COVID-19. There are several innovative apps now available for real-time geospatial tracking of COVID 19 cases, and similar ones could be developed for tuberculosis.²

It is imperative to strengthen and advance the capacities District TB centres and other Peripheral Health Institutes (PHIs) involved in the detection and treatment of tuberculosis to streamline the control of tuberculosis. Special campaigns, as have been done during polio and COVID-19 control programmes, should be adopted for tuberculosis as well. We do have Mr Amitabh Bachchan as the brand ambassador for the NTEP, and we need more such ambassadors at the national, state, regional and local levels. Public representatives and administrative officers such as MPs, MLAs, Pradhans, and religious and community leaders should be involved to stir a mass movement for the elimination of TB. Various platforms such as electronic, print and social media should be used extensively for public awareness, and should be complimented by plays, 'nukkad nataks', wall writing and pamphlets. Tuberculosis detection and awareness camps should be organised during various

governmental and non-governmental gatherings such as *Tehsil diwas*, festivals, exhibitions, *Kumbh* and other *melas*, etc. A 'Jan Andolan' should be declared against tuberculosis, just as was done against COVID 19.

The pandemics caused by both SARS-CoV-2 and *Mycobacterium tuberculosis* has been so severe and difficult to contain because neither of the pathogens tends to respect geographical and social barriers. Crucial interactions between COVID-19 and TB need to be anticipated and understood since both the diseases have some similar respiratory symptoms. A surprisingly rapid response in developing treatment plans against COVID-19 at a global certainly proves how the existing programs could be significantly improved and lessons learnt from this must be applied to other infectious diseases, including TB, where a similar emphasis on clinical and research activity would no doubt have a very large impact. As both COVID-19 and TB are transmitted by aerosols, strategies like physical distancing, mask, respiratory and overall hygiene may also help in reducing the transmission of TB as well. Community engagement has proven essential in TB control to address stigma, which has already been associated with COVID-19. It is time we transform this unprecedented adversity into a groundbreaking opportunity.

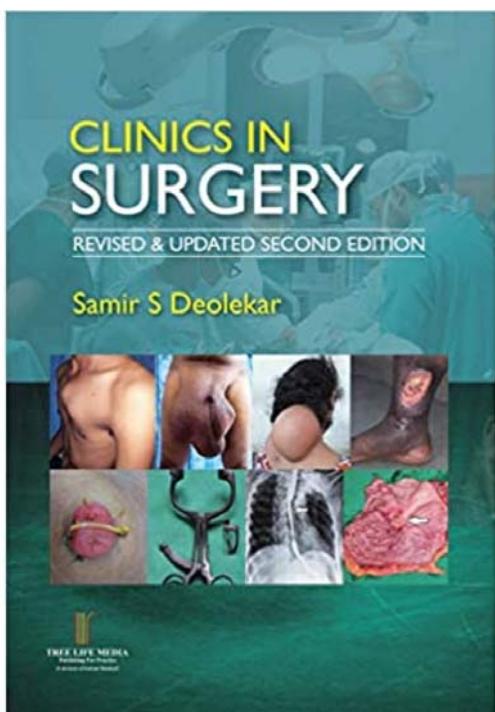
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(Answer : Mediquiz 04/2021)

(1)e. ; (2)d. ; (3)c. ; (4)a. ; (5)a. ; (6)c. ; (7)c. ; (8)d. ; (9)a.; (10)c.; (11)e. ; (12)d.;(13)c.; (14)d. (15)d.

Book Reviews



"Clinics in Surgery" by Samir S Deolekar, 2nd Edition, 2020, Published by Tree Life Media

(A Division of Kothari Medical), Opposite Wadia Children's Hospital, next to Shanti Bhuvan Lodge, Acharya Donde Marg Parel, Mumbai (East) 400012, Maharashtra, pp 1-358. 20cmx14cmx4 cm, Rs775.00.

Clinics in Surgery, written by Samir S Deolekar is a "well crafted" book. It seems that the author has targeted the UG students. I am convinced that his mission is completely successful. It would recommend it as a ready reckoner for PG trainees too.

The content is wide and covers most topics which are relevant for exam purposes. Though written in a precied structure, it touches the must read areas in a lucid technique. However, the students cannot afford to miss any points out of what has been covered.

The algorithmic approach is something which I liked most about the book. It is likely to be an instant hit amongst students. As a reviewer I find it extremely easy to recapitulate a topic very fast. I, therefore, feel it can also be very helpful for practising surgeons.

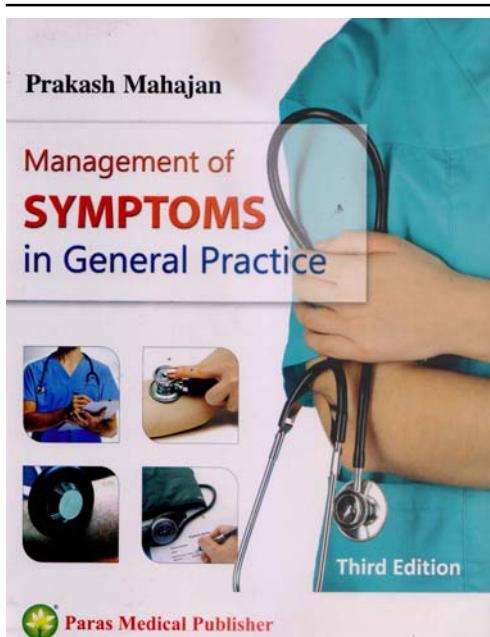
The chapters are written in a focussed way avoiding unnecessary inclusions. The language is quite fluidic. The pictures are relevant . I would have appreciated more if all the pictures were captioned with a one liner attached to describe them.

As a whole I would recommend this book for everyone from trainees to practitioners both as preparatory tool as well as a ready reckoner.

My best wishes to this edition of the book

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"Management of Symptoms in General Practice" by Prakash Mahajan, 3rd Edition, 2018, Published by Paras Medical Publisher, 5-1-475, First Floor, Putlibowl, Hyderabad 500095, Telangana, India, pp 1-517. 24cm x 18cm, Rs525.00.

'Management of symptoms in General Practice' book written by Dr Prakash Mahajan and Published by 'Paras Medical Publisher' have discussed the most and the less frequently dealt problems in day to day general practice.

Major and Minor symptoms which we come across in day-to-day life have been discussed here very methodically under the heading 'Approach to a symptom'.

Some of the Minor Drawbacks —

The author forgot to discuss a frequently met symptom 'The SYNCOPÉ'.

He also missed to mention the role of medicines that can cause Vertigo or light headedness like Alphablockers, muscle relaxants, sedatives and anti convulsants, anti depressants etc. The ophthalmological causes of vertigo has not been dealt with Peripheral Neuropathy should have been mentioned as one of the major causes of vertigo also.

While managing 'Hiccup' role of Baclofen should have been mentioned also.

Some other common symptoms like excessive drowsiness, painful intercourse, something coming out per vagina, hirsuitism, small genitalia (hypogonadism) were within the scope of discussion in this book which have been overlooked.

Symptoms like dysuria, nocturia, urinary hesitance and incontinence of urine could have been discussed here also.

To sum up, this book is an excellent companion for an aspiring General or Family physician for guidance and a ready reckoner for a senior experienced physician also.

I will rate this book as 9 out of 10. Thanks to Dr Mahajan.

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Dr Arunabha Sen

Letters to the Editor

[The Editor is not responsible for the views expressed by the correspondents]

Artificial Intelligence

SIR, — Artificial intelligence today is a hot topic in healthcare sparking ongoing debate about the ethical, clinical, and financial pros and cons of relying on algorithms for patient care.

AI promises to change the medicine practice in various ways but many of its practical applications are still in their developmental stages. Medical professionals need to understand and acclimatize themselves with these advances for better delivery to the patients.

From deep learning algorithms that can interpret CT scans faster than humans to natural language processing (NLP) that can comb through unstructured data in electronic health records, the scope of AI in healthcare is endless.

A lot of enthusiasm for the technology comes from the belief that it has the power to bring a revolution starting from creating cutting edge medical devices to reducing misdiagnosis, delivering faster, better and precise care to the at-risk patient groups.

AI could benefit patients living in rural communities where access to doctors and specialists can be tough.

There are significant challenges that hinder the widespread adoption of AI; for instance, issues pertaining to data interoperability, privacy, algorithm development, integration of AI tools into provider workflow and reimbursement of AI-assisted devices.

Large amounts of high-quality data are often needed in development of AI algorithms and tools.

Many available data may be biased—which can impact on the quality and accuracy of AI tools.

But like any other technology at the peak of its hyper curve, AI alongside enthusiasms has criticism from its skeptics from die-hard evangelists. The belief that AI will replace human workers has been around since the very first automata appeared in ancient myth.

Physicians are starting to be concerned that AI is about to evict them from their offices and clinics.

By 2053, surgical jobs could be the exclusive purview of AI tools, cautioned Oxford University and Yale University in a 2017 study.

In June 2018, Babylon Health announced that an AI algorithm scored higher than humans on the written test on diagnostics used to certify physicians in the UK.

Radiologists and pathologists may be especially vulnerable, as most of the breakthroughs are happening around imaging analytics and diagnostics.

AI may help to alleviate the stresses of burnout of physicians and nurses by taking up tasks of HER documentation, reporting, triaging CT scans, freeing them to focus on complicated challenges of patients with serious conditions.

AI will change the way patients interact with providers, providers interact with technology, and everyone interacts with data. But healthcare providers care deeply about their relationships with patients and prioritize face time above

most other aspects of the job.

No one expects a robot to talk to the patient's family about treatment options or comfort them if the disease claims the patient's life.

The increased comfort with AI will not necessarily decrease the value of patient-physician relationship.

But it definitely fills existing gaps in care access, expands availability of information, completes the administrative tasks and reduces the workload of the physician.

AI is exciting, confusing, frustrating, and with continuing maturity will only add to mixed emotions.

We humans have the reins and have to eventually make the hard choices and shape the future of healthcare.

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President, Association of Physicians of India (2021-22)

Ex. Professor & Head, Department of Medicine

S K Medical College, Muzaffarpur, Bihar

JIMA, February 2021

SIR, — After going through the JIMA, February 2021, I must appreciate the editor and the editorial board for taking keen interest and spending lot of time in selecting appropriate articles to be published in JIMA. The journal has given equal importance to rural health [Pituitary hormone deficiency in the rural West Bengal, Hilly areas [precautions for COVID 19] and tertiary care. By including Surgeon's dilemma in Covid 19 show the interest of including recent diseases. The biochemistry, pharmacology topics are also included [Transfer GGT in Acute Stroke] and Lincomycin in Upper respiratory tract infection. Equal importance is given for medical education and resident programs [Health care system] and medical students perception of education. Health care system is well analysed in another article. Discussion on the tuberculosis of Vulva, non-traumatic cardiac tamponade, diabetic foot management, PUO, management of asthma. Images, ECG and Quiz are all doctors. Medical history on BCG vaccine and Archived journal of December 1952 brings the nostalgic memories. Books on Toxicology and Humanities are of great practical use. Overall it is a complete journal for all doctors.

Professor of Surgery,
AIMST University, Malaysia

Prem Kumar

The Re-Emerging Pandemic — What's Urgently Needed in West Bengal ?

SIR, — Under the prevailing situation of the so-called second wave of the pandemic in India, is there a focused attempt in place for detecting how many of current Covid-19 cases have already received full doses (2 doses) of vaccine (and which vaccine)?

In India already 5.1 million healthcare workers and 3.7 million frontline workers nationwide have received two

doses. Cohorts of these individuals would be easy to follow up to determine the real world efficacy of the vaccines. One approach could be prospectively following up all those who received 2 doses of the vaccine, and find how many of them fall prey to corona infection despite being vaccinated. It is also important to study the outcome in such cases – fatality rate, severity score. The other approach is at the time of RT-PCR testing, one should ask all positive cases, if they received two doses of a vaccine. It is very important to understand the real world effectiveness and safety of these two vaccines.

In the 'second wave' in the country, relatively more number of younger people is getting infected rather than older citizens. In Panjab the Chief Minister reportedly said >80% of RT-PCR positive cases are infected with the UK variant. And most of them are from younger age group. And none of these people are vaccinated. The Covishield vaccine is found to be effective against the UK variant of the virus, according to a recent study. The AIIMS Delhi Director claims in Delhi the current surge has mostly affected the younger age group. It seems the younger Indians are more vulnerable during this second wave. The variant (mutant) strains reportedly have higher transmission potential compared to the wild strain. Therefore breaking the chain of transmission should be tried more seriously. Remember, truly we do not have any specific treatment yet available. It is very important to include younger adults in vaccine beneficiary group as early as possible.

In this election time, the political parties and their leaders must conduct more responsibly. Till now there is blatant violation of COVID norms as asked by the Election Commission. This must stop now. The Election Commission should immediately have an all-party meeting and strongly communicate do's and do not's.

A few important considerations need to be emphasized now are as following:

- (1) Public campaign for COVID appropriate behavior – masking, avoiding crowd and crowded places, social distancing, handwashing and sanitization, cough etiquette (Stakeholders – Doctors, IMA, Corporation- Panchayat, Media, Political Parties, and Government)

- (2) Getting rid of complacency (Stakeholder– Society)

- (3) Increasing the number of RT-PCR testing (Stakeholders – People, Doctors, Government)

- (4) Isolation (and treatment) of lab-diagnosed or suspected cases of Covid-19 (Stakeholder– Government)

- (5) Diligent contact tracing (Stakeholder – Government)

- (6) Exponential increase in vaccination (Stakeholder – Government)

- (7) Continuous monitoring of the situation and regular public updating of the situation (Stakeholder – Government)

- (8) Prioritizing logistics management (Stakeholder – Local Administration)

- (9) Continuous scientific exploration (research) to understand the nature of the re-emerged infection and investigating the potential of different mutant strains with genomic probing (Stakeholder – Government)

- (10) Strongly administering safer, low-risk environment and behavior during the current election process (Stakeholder – Election Commission)

¹MBBS, MD, DM,

Clinical Pharmacology

Santanu K Tripathi¹

Shambo Samrat Samajdar¹

JIMA, February 2021

SIR, — The editorial in February issue of JIMA titled 'ensure not insure' is the real crux of the problem that now our country is facing in the field of health care delivery system. To question the role of insurance in health care delivery needs lot of down to earth thinking because today most of the countries, be developed or developing, are depending more on insurance. This becomes more pertinent for our country where Ayushman Bharat, the government declared insurance based health scheme covers both public and private sector and the premium is totally paid by government. So it means free treatment even at private hospitals. But here nobody raises the question that where from government is getting the money? Undoubtedly it is from budget, from direct and indirect taxes. In other word it is people's own money. So though we are not directly paying premium but indirectly it is our own money.

After independence health care delivery system depended on public sector but as time went private sector came up. At present except for primary health care private sector has become a major health care provider in secondary health care as well as tertiary with more than 50% of medical colleges run by private establishment or corporate houses. With this insurance based system people at large will move to private sector because of their strong marketing policy and now these people do not have to pay directly. If some one goes through the records for last 2 years it will be evident that major share of Ayushman Bharat fund or Swasthya Sathi fund (health scheme in West Bengal) has gone to private sector.

At present central government is spending 1.2 % of GDP towards health care which is meagre in comparison to other countries as stated in the article. If a major share of this moves to private sector through insurance then we can hardly expect any improvement in public sector in future. We have every reason to fear that in future the private sector or corporate houses will become the policy makers in health care delivery system. More over it is well accepted fact that insurance in health care carries a major risk of moral hazard as because these insurance companies and private sector are profit driven organisation. If we take the example of crop insurance, the Insurance companies made huge profit from the premium collected as because merely 25% of the amount was settled as claim for the farmers and rest went to the pocket of insurance companies.

It will be better if government provides health care to people at large by increasing GDP allocation and gives priority on primary health care. The same policy should be followed in providing basic education, water, housing and proper sanitation to majority people. All these are enshrined as basic right in our constitution but who cares.

It is commendable that JIMA editorial board has correctly raised the issue at this juncture as because this insurance system will have a long lasting detrimental effect on our health care delivery system.

Member Bidhannagar branch **Satyajit Chakraborty**
Kolkata

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Communications intended for publication should be sent to the Editor, Journal of the Indian Medical Association (JIMA). JIMA will consider manuscripts prepared in accordance with the **Vancouver style¹**.

Articles are considered for publication on condition that these are contributed solely to JIMA, that they have not been published previously in print and are not under consideration by another publication. In the selection of papers and in regard to priority of publication, the opinion of the Editor will be final. The Editor shall have the right to edit, condense, alter, rearrange or rewrite approved articles, before publication without reference to the authors concerned.

Authorship: All persons designated as authors should qualify for authorship. Authorship credit should be based only on significant contributions to (a) conception and design, or analysis and interpretation of data; and to (b) drafting the article or revising it critically for important intellectual content; and on (c) final approval of the version to be published. **Conditions (a), (b) and (c) must all be met.** Authors may include explanation of each author's contribution separately.

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Text—The text of Original Articles should conform to the conventional division of Abstract, Introduction, Material and Method, Observations, Discussion, Conclusion and References. Other types of articles such as Practitioners' Series, Case Reports, Current Topics, etc., are likely to need other formats.

Statistical evaluation—Description of the statistical methods used should either be given in detail in the "Material and Method" section of the article or supportive reference may be cited.

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Reference from book:

²Handin RI— Bleeding and thrombosis. In: Wilson JD, Braunwald E, Isselbacher KJ, Petersdorf RG, Martin JB, Fauci AS, et al editors—Harrison's Principles of Internal Medicine. Vol 1. 12th ed. New York: Mc Graw Hill Inc, 1991: 348-53.

Reference from electronic media:

³National Statistics Online—Trends in suicide by method in England and Wales, 1979-2001. www.statistics.gov.uk/downloads/theme_health/HSQ 20.pdf (accessed Jan 24, 2005): 7-18.

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¹International Committee of Medical Journal Editors—Uniform Requirements for Manuscripts Submitted to Biomedical Journals. *JAMA* 1997; 277: 927-34.

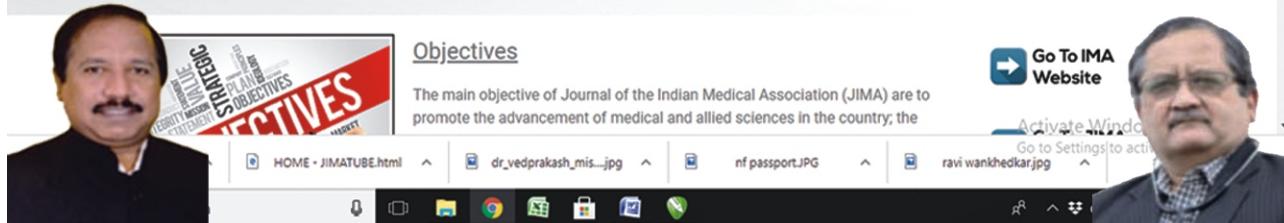
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Dear Dr Kaushik Bhattacharya,

Greetings from IMA HQs.
This has reference to your email as under.
On behalf of Indian Medical Association, it gives me a great pleasure to congratulate you, as your article - "Surgeon's Dilemma during COVID 19" is recognized by World Health Organization and selected as Global Literature on Covid-19.

I will also take this opportunity to appreciate and congratulate the Editorial Board of JIMA for selecting quality articles for our monthly magazine, especially on the subject like Covid-19.

Wishing you all the best in all your endeavours.
Thanking you and with kind regards,
Yours sincerely,

Dr Jayesh M Lele
Hon. Secretary General, IMA
Copy to :- National President, IMA

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Surgeon's dilemma during COVID-19
Kaushik Bhattacharya, Neela Bhattacharya
Journal of the Indian Medical Association ; 119(2):31-32, 2021.
Article in English | WHO COVID | ID: covidwho-1139081

ABSTRACT

The coronavirus disease 2019 (COVID-19) pandemic has brought about unprecedented adaptations in healthcare management, be it at a local or global level. Surgeons are facing a lot of dilemmas in the ongoing pandemic regarding the practice. On one side there are compulsions to manage the surgical patients without any hesitation in the operation theatre, there is another side of surgeons where he must return back home safely without self getting infected with the virus. Till the curve flattens, its going to be a surgical challenge and a herculean task for the surgeons at large to fight the COVID-19.

Vol 119, No 2, February 2021 **Journal of the Indian Medical Association** **31**

Review Article

Surgeon's Dilemma during COVID-19
Kaushik Bhattacharya¹, Neela Bhattacharya²

The coronavirus disease 2019 (COVID-19) pandemic has brought about unprecedented adaptations in healthcare management, be it at a local or global level. Surgeons are facing a lot of dilemmas in the ongoing pandemic regarding the practice. On one side there are compulsions to manage the surgical patients without any hesitation in the operation theatre, there is another side of surgeons where he must return back home safely without self getting infected with the virus. Till the curve flattens, its going to be a surgical challenge and a herculean task for the surgeons at large to fight the COVID-19.

Key words: COVID19, Pandemic, Laparoscopy, Chemoprophylaxis.

The Doctor's Dilemma is a play by George Bernard Shaw, which was first staged in 1906 and highlighted doctor's dilemmas created by scarce medical resources in a different context. The ongoing outbreak of novel corona virus (COVID-19) has created a global crisis of unprecedented dimensions. It is wreaking havoc across healthcare services and has crashed economies across the globe. It has disrupted human society on a scale that most living

Editor's Comment-
Surgeons are facing a challenging time during COVID-19.
■ They must not only choose the fittest candidate for surgery during this pandemic, but they have to keep themselves fit too to face the challenge.
■ There are several dilemmas which each surgeon are facing in their career

million tests since it began testing in February but many experts

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