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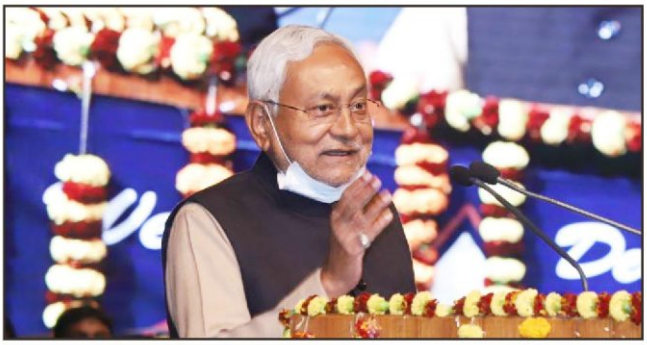






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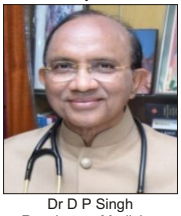
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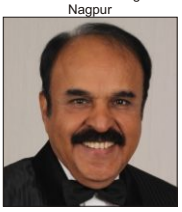
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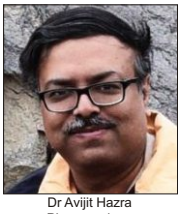
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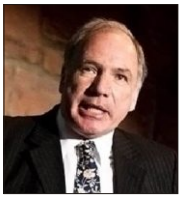
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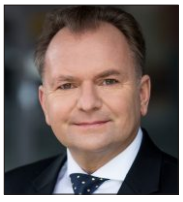
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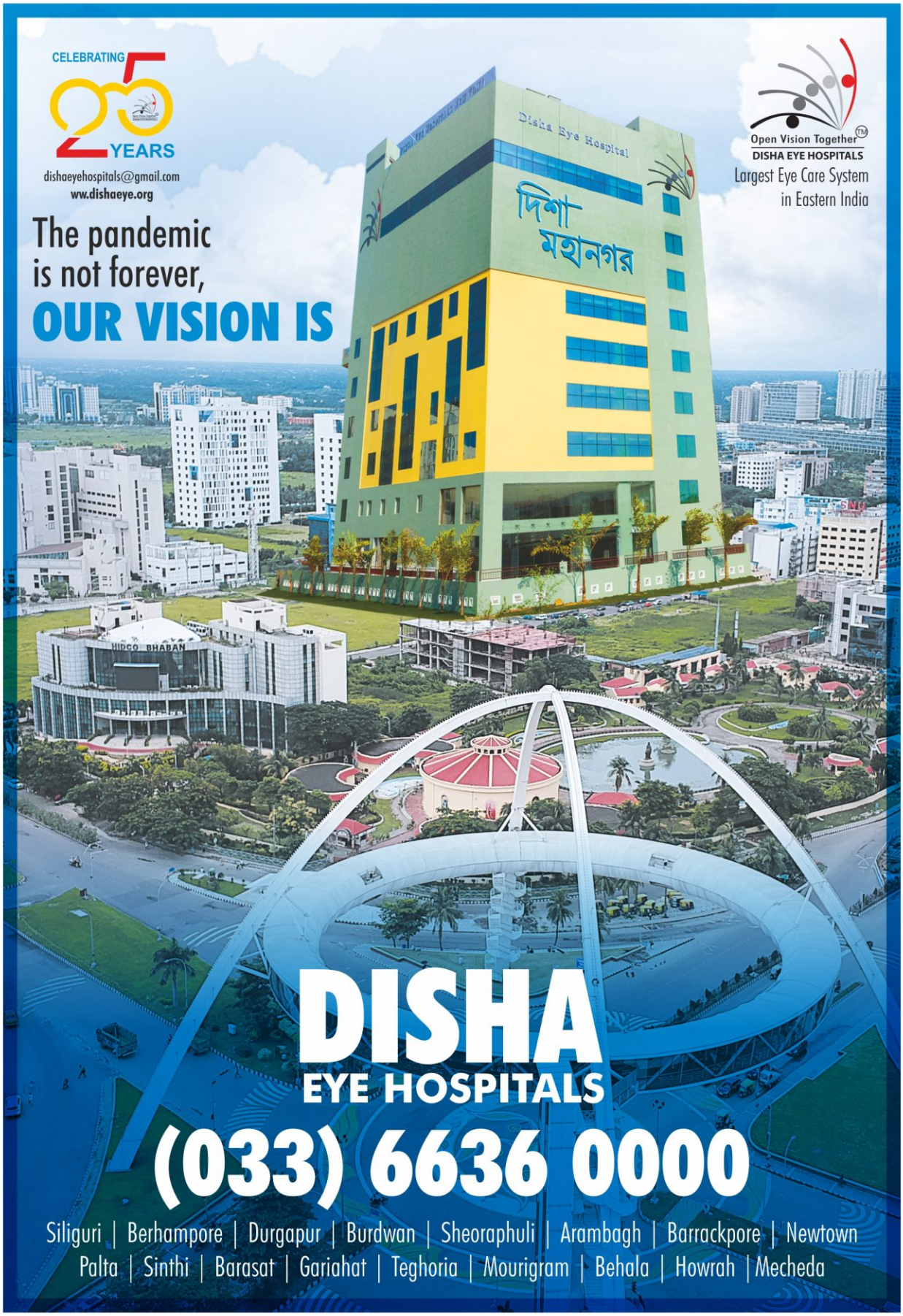
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Editorial

Prof. Sujoy Ghosh
MBBS, MD, DM, FRCP, FACE, FICP
Hony. Editor

Prof. Pradip Mukhopadhyay
MBBS, MD, DM

Getting Published : The Inside Story

Publishing original articles in a science journal is an essential requirement for career progression and is an important signature of a researcher's endeavour to contribute to science. However, on the part of the journal authority, the importance of publication is to take the science forward by proving/disproving some hypothesis with factual evidences or generating some new hypothesis.

Let us start the discussion with some semi-arbitrary information. A good medical journal with moderate to high impact factor receives about 3000-4000 research articles annually. However on an average, even if 15-20 original articles are published in a single issue of a monthly published journal, the number of published articles is no more than 250 per year. Hence not more than 10% of all submitted articles get published. The articles submitted undergo screening and have to pass through a stringent peer-review process. It needs to be appreciated that not all articles are worth reviewing and additionally there are only finite number of good reviewers available. Hence the handling editor or associate editor rejects upto 80% of all articles submitted and only about 20% are sent for peer review of which about half make it to the print issue of the journal after revisions.

But what are the primary reasons for which an article is rejected? How can we improve our articles to increase its chance to be published in an impactful journal? It is worthwhile to mention here that one should be careful about the so called predatory journals. It has been mentioned in the reputed journal 'Nature' that articles are published (taking fees from authors which is not synonymous with publication charge. Publication charges are applicable only after acceptance of the article following stringent peer-review for most of the reputed journals, more specifically if the journal is open-access). Predatory journals do not undertake necessary quality checks for issues such as plagiarism or ethical approval and lacks transparency in many aspects. These journals pose a global threat (https://www.nature.com/articles/d41586-019-03759-y)

Once an article is submitted, it passes through a stage of technical checks by the journal authority to verify whether the 'Author's instruction' has been followed strictly with respect to various aspects. If not, the article is 'Unsubmitted'. However this does not mean that it has been rejected. The primary reasons may be that there is no mention about the 'Conflict of interest', 'acknowledgement to the Grant providers etc' or STROBE/PRISMA/CONSORT (mentioned later) is missing. It may also be related to the fact that the appropriate font size is not followed or line/page number and line spacing is either missing or not appropriate. Once all requirements are fulfilled and the article has been resubmitted, it is likely to be categorised as 'Submitted to the journal'. However, in majority of cases it is rejected with a soft letter from the editorial office expressing their inability to accept the article but with an advice to consider the journal again for future submission of other articles. This means the article did not get the fortune to get peer-reviewed before rejection.

Here are some points to ponder upon. Rejection at first sight is primarily done by seeing the title and the abstract only. Hence be careful when an abstract is being written. However, as the abstract should be written after completing the manuscript writing, we will discuss about it at the end of this editorial.

The first part of the article is '**Introduction**'. Please remember that no good journal will accept an article unless it has some novelty of information. This section should ideally focus on three things. First of all, please mention in brief the knowledge that is already available on the particular topic. Please try to avoid any unnecessary information which is not related to the respective research. In fact, the draft-writer should ask himself after writing each line: 'How is this sentence related to the current research?' 'Is this at all relevant to the current research?' After mentioning the available knowledge, one should focus on the 'knowledge gaps' in the current understanding. And finally, why is this research undertaken and how could it make some progress to meet up these 'knowledge gaps'? In fact, it is the section where you should mention the '***Hypothesis of the study'***. A research work without a specific and concrete hypothesis has a grim probability to reach the printed form. Please restrict this section to 400-500 words as most of the journals ask to complete an article within 2500-3000 words (excluding Abstract, References, Figures and Tables). Some journal specifically wants a summary of information as 'Research in context' or 'Highlights' to make it attractive to the readers.

Next section is on '**Materials and methods'**. Though this section may not carry much significance to general audience, this is the most critical section that determines the fate of the article. It is frequently and aptly said that "Describe your subjects first". Many reviewers prefer the participants to be referred as 'Subjects' and the term 'patients' should be avoided. Very frequently, this section is unnecessarily shortened (assuming that readers are already versed with the topic). But to a peer-reviewer/ scientific researcher the most important non-compromising questions are: Who were the participants of the study? Is the inclusion/exclusion criteria sufficient to answer the question related to the hypothesis? How were they selected? Were they adequate in number? Was this selection in a random way or in the non-probability purposive format that groups were divided? Was there an approval from 'Institutional Ethics committee'?

Next issue will be the 'power of the study'. In short, it tells us whether the study has sufficient capability to answer the question raised in the hypothesis. Hence calculation of sample size is another big issue which may also determine the prospect of the article. In this section, it is not necessary to mention the statistical formula on which the calculation is made. But you should mention the principles of such calculation: What degree of power have you chosen (90% or 80% equivalent to a Type 2 error of 10% or 20% respectively. Power less than 80% is not acceptable?) However, the allowed type 1 error is only 5% or less, and this also needs to be mentioned. Also, you must mention, what was the standard deviation for the related samples? This must be available in some previous literature. The margin of error you have chosen apriori (may be based on confidence interval of previous studies) may also be necessary to calculate the sample size (equivalent to type 2 error). However a detailed discussion on this aspect is beyond the scope of this article.

Many of the reputed journals require some other forms to be filled up. At an individual level for the beginners, usually the study is either cross-sectional or prospective. This needs a 'STROBE' (STrengthening the Reporting of OBservational studies in Epidemiology**)** statement to be filled up. Similarly a meta-analysis deserves a PRISMA statement (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). For conducting a randomised controlled trial with intervention, the trial must be registered with Clinical Trials Registry-India (CTRI) and while writing the article the CTRI registration number must be mentioned and a CONSORT flow diagram (Consolidated Standards of Reporting Trials) must be included in the manuscript. All these formats are available online.

In the **'methods'** subsection you must clearly mention the clinical parameters and the biochemical, pathological, radiological tests you have done. With regards to the new investigations (and frequently for the established investigations also) you must mention the instruments used (with the company specification including the name of the country which has marketed this), the kits used (again with the company specification including the name of the country where it is manufactured), the reference range for a particular analyte, the precision i.e. the lowest level that the machine could detect, and co-efficient of variation of such determination as reported by the manufacturer.

Next important aspect in 'Materials and methods**'** is mentioning the statistical aspects related to the analysis of the collected data. Here you must clearly mention the name of the statistical tests you have applied. The appropriateness of applied the statistical tests also have a clear role in determining the fate of the article. Before subjecting any set of data for comparison, one must look for the 'goodness of fit' to examine whether the data is normally distributed or not. Please remember that the necessary tests vary according to whether the data is normally distributed or not. For data which are not normally distributed, you should choose appropriate tests for non-parametric data or use bootstrapping. If you plan to do a regression to find some predictors or something else, please mention beforehand the covariates that you will use. Please note that if two co-variates are highly correlated, then multicolinearity assay must be done to calculate 'the variance inflation factor'. It is childish to mention that you have taken a p value of <0.05 for determining the significance as this is now a universal truth. Also if you have adjusted your data for some confounders, please mention it.

The next part is about presenting what you have found in the experiment in the **'Results'** section. Please be careful to present the baseline data first, as it is already mentioned that a reviewer deserves to know the background information of the included participants. Please note that a direct copy of the software output of the results indicates nothing other than your non-professionalism. Please do not stress much upon the p

value only. You must mention the comparative results side by side and then mention the p value as a marker of the degree of significance and the test by which this value is obtained. Do not mention p=0.000, though it is given in the software output. You should change it to p = <0.001 to indicate the level of significance. Also one should be aware that, on similar questions (or subsets of this question) repeated tests may inflate the type 1 error and make the interpretation fallacious and non-acceptable. Apart from these, it is worth mentioning that most of the journals do not allow more than a total of 4 tables and figures altogether. Very frequently it is seen that the results are mentioned simultaneously in tables, in text and sometimes in diagrams also. It is not only unnecessary but also poses as a source of irritation to the reviewer. Hence one should not put the results in duplicate in separate formats. If a diagram does not add anything extra, please do not include it, even if you have made it with beautiful colours (Remember charges for publishing even after acceptance is very high for coloured diagrams). Please do not forget to refer to your tables/diagrams in the appropriate areas of the text while submitting. Otherwise the table/diagram may go unnoticed. Please note that you should use same number of decimal places for similar type of data. Also, if you plan to submit the articles to a European Journal, please use SI Units in place of conventional units.

The last part of the article is '**Discussion'** which includes **Conclusion** also. Some journals specifically want a separate section on conclusion as well. This section should be written very meticulously and must conform to your results directly. *However you should avoid mentioning your results again in this section.* Specifically you should compare your observations in the perspective of others' findings available in the literature and try to put forward explanations for those differences. Not only should you critically analyse the results, but you should also discuss about the methodology (especially if it is different from others) if needed. If something novel or new information is obtained, you may put it as a new hypothesis to be explored in future studies. Please do not overstate any information which was not related to your experiment. For example: if you have found that 25-hydroxy Vitamin D level was different between obese and non-obese subjects and it was significantly low in obese, please do not comment that the obese persons might benefit from Vitamin D supplementation. This statement was not studied in your experiment and needs a separated and dedicated RCT to be valid.

Some journal also needs some information on the **'Limitation of the study'**. Please note that if you have calculated the sample size, it should never be perceived as a limitation of the study. However, if something in not done or tested for some reasons (like logistic or economic constrains) which is not extremely important but should have been done ideally, it should be mentioned as a limitation. Again it is also essential to know that as the experiment was done on a particular population, it should not be generalized to be applicable in other age groups or other ethnic population. This also needs to be considered in section 'Limitations of the study'.

Returning back to the **Abstract** section, it is necessary that this section should be structured. For most of the journals, it must be limited to 250 words. The main focus should be on the 'Introduction' which in 3-4 sentences should be able to state the hypothesis i.e. why the study is performed, following the same format that we have already discussed at length. In the 'Method' section, it is necessary to state the nature of the study and enumeration of the general and special methodological processes only without any additional details. While in the 'Results' section, it is not possible to mention about all, it is mandatory to put the main observations in short (including the numerical comparative results of main findings with significance, if word limit is not exceeded). Finally the 'Conclusion' should be made in 2-3 sentences and it should be crisp and conform to the hypothesis and the results. Also try to make the title short, novel and attractive so as to draw the attention of the reviewer.

Before concluding, it is necessary to mention that you should choose an appropriate journal for your article. For example, some journals publish articles based on patho-physiology, some are interested in clinical epidemiology, some are interested in clinical research, and some journals do not publish meta-analysis and so on. You must be careful about the audience of your article before selection of your journal. Impact factor is also a big issue before you send an article to a particular journal.

Please note that the article must be written in a very simple language, easy to understand, with no grammatical errors and without any unnecessary capitalization. Ornamental English has no special privilege in this respect. One small tip is that: You may send it to some of your reliable colleagues or friends or researchers to get their input. You may acknowledge their names but this help does not qualify them for an authorship for the article as per standard guidelines laid by ICMJE *(International Committee of Medical Journal Editors)*. Alternately you may follow this trick also: Complete the write up, forget it for about 2 weeks and then work on it again. You will surely find many discrepancies which evaded your notice earlier as you were very close to it at that time.

So to conclude, if your research work is hypothesis-driven, inclusion/exclusion criteria and intervention (if any) are optimum and ethically approved, the number of subjects are adequately powered to address the hypothesis, appropriate statistical tests are applied and results have some novelty of information in the clinical or research field and conforms to the hypothesis, it is very likely that your article will not get rejected at first sight and is bound to reach the stage of peer-review. If it undergoes review and is then rejected, you will also get the reasons for the rejection from 'Reviewers' comment'. You could amend the article in lines of their suggestions and resubmit to some other journal with less impact factor and you are likely to get 'SUCCESS'.

Happy publishing.

Sujoy Ghosh, Pradip Mukhopadhyay
Professor, Department of Endocrinology, IPGME&R, Kolkata 700020

Original Article

Repair of Atrial Septal Defect Using Pedicled Right Atrial Wall Flap — A Retrospective Observational Study of a Novel Surgical Technique in a Tertiary Care Hospital in Eastern India

Prakash Kumar Sanki[1], Shilpa Basu Roy[2], Subesha Basu Roy[3]

Introduction : In our institute, we have used the pedicled right atrial wall flap as an alternative to a free patch to close Atrial Septal Defect (ASD) in a series of patients. We hereby, report its results.

Methods : Between January, 2016 and September, 2018, 24 patients (mean age 25.2 ± 12.43 years; range 5 years to 51 years), underwent closure of ASD with pedicled right atrial wall flap. All the patients who underwent this procedure had ostium secundum type of ASD without any other Intra-cardiac anomaly.

Results : The intraoperative and postoperative period was uneventful in all the patients. The mean aortic cross-clamp (X- clamp) time was 13 ± 2.99 minutes (Mean ± SD) and the mean duration for Cardiopulmonary Bypass (CPB) was 46.5 ± 10.23 minutes (Mean ± SD). There was no mortality. All the patients were discharged either on 3rd or 4th postoperative day. The pre-discharge and latest follow-up Transthoracic Echocardiographic Evaluation was found satisfactory in all the patients. None of them revealed any residual shunt, peri-flap Thrombosis, Flap dehiscence or shrinkage, or Cardiac Dysfunction.

Conclusions : The Pedicled Right Atrial Wall Flap can be safely used as an alternative for pericardial patch for ASD closure. It is a novel technique with several advantages.

[*J Indian Med Assoc* 2022; **120(1):** 14-6]

***Key words* : Atrial septal defect, Ostium secundum, Pedicled right atrial wall flap repair.**

Atrial Septal Defect (ASD) is one of the most common congenital Cardiac anomalies. Over time, there has been a lot of advancement in the procedure for ASD closure. This includes conventional Open-Heart Surgeries through Median Sternotomy or Minimally Invasive Approach or even device closure through Percutaneous Approach. Different materials are used as patch for closing the ASDs. Commonly autologous pericardial patch is used. But other materials such as Bovine Pericardium or synthetic materials such as Dacron are also used as patches for ASD closure. But none of these patches are not without complications. Patch related complications such as Patch Dehiscence, Peri-patch Thrombosis, Haemolysis, and infective Endocarditis has been reported. In our technique we have used a Pedicled flap of the Right Atrial Wall for closure of ASD. As the right atrial wall has the same consistency as that of the atrial septum, the repaired inter-atrial septum is of homogenous consistency at the site of the defect. Moreover, with the right atrial flap being pedicled, it is living tissue which has the capacity for future growth and problems such as patch dehiscence or shrinkage does not occur. Since the inner surface of the atrial wall has a smooth endothelial cell lining, complications such as Thrombosis or Infective Endocarditis, are also less likely to occur. Our technique also helps in reducing the overall size of the grossly enlarged right atrium that occurs due to the ASD.

Editor's Comment :

- Surgical closure of atrial septal defect can be safely done using a pedicled right atrial wall flap instead of the conventionally used materials like autologous pericardium or Dacron.
- This new technique has several advantages over the currently used techniques & has shown promising results.

Materials and Methods

All Patients presenting with ASD in the Out-patient Department (OPD) of Cardiothoracic & Vascular Surgery at IPGME&R and SSKM Hospital Kolkata, who had indications of Surgical closure and who were in Sinus Rhythm were selected for our new Surgical technique. We had excluded critically ill patients, those having symptoms of Advanced Heart Failure and haemodynamically unstable patients.

The study period was between January, 2016 and

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Received on : 05/12/2021
Accepted on : 11/12/2021

September, 2018. In our study we had twenty-four patients who presented with Ostium Secundum type of ASD, who underwent closure of the defect using our novel Pedicled Right Atrial Wall Flap technique. None of our patients had any other associated Intra-cardiac Anomaly. All the patients presented with shortness of breath on exertion. Two patients had mild to moderate Pulmonary Artery Hypertension. None of the patients had Congestive Heart Failure.

The parameters such as patients' age, gender, operative data such as X-clamp & CPB durations, postoperative details such as details of morbidity/ mortality, duration of postoperative stay/ discharge from hospital and follow-up data such as duration of follow-up and details of any delayed postoperative complications like Arrhythmia, Patch Dehiscence, thrombosis etc. were studied. Ours was a retrospective observational study. Analysis of data was done using standard statistical analysis.

Operative Techniques : Through a median sternotomy approach, assessment of the Cardiac Anatomy was done. After aortic and direct bi-caval cannulation, standard normothermic total Cardiopulmonary Bypass (CPB) was established. The aorta was cross-clamped and myocardial protection was achieved with standard antegrade St Thomas-II blood cardioplegia and topical ice slush/ ice-cold saline. Thereafter the Right Atrium was opened through a small stab incision after adequately snugging the cavae. The Right Atrial incision was then extended in such a fashion, to create a pedicled flap. This was done by an oblique atriotomy incision parallel to and about 1 cm away from the Atrioventricular Groove and reaching upto 1cm from the Sondergaard's Groove and another incision extending vertically down (on surgeon's perspective), reaching up to 1 cm away from the Sondergaard's Groove (Inter-atrial Groove). The base of the flap which was parallel to and approximately 1 cm away from the Sondergaard's Groove was left intact, as its wide pedicle (Fig 1; Image A-D).

The size of the flap was roughly the size of the ASD. The flap was then sutured around the margins of the ASD using 4-0 or 5-0 polypropylene (depending on the thickness of the Right Atrial Wall). The suturing was started from the postero-inferior end of the flap with the corresponding postero-inferior margin of the ASD, then continued forward and upward, all along the anterior margin of the defect & then finally backwards over the superior margin until the end of the flap-incision was sutured securely to the supero-posterior margin of the ASD. Prior to placing the suture knots, de-airing of the Left Atrium was done as per standard technique. Suturing of the posterior margin of the defect was not required as it remained enclosed within the wide pedicle of the flap (Fig 1; Image-E).

The Tricuspid Valve was assessed for presence of any regurgitation by infusing saline into the right ventricle. When satisfied, closure of the Atriotomy followed. The closure of the Right Atriotomy Incision was done by suturing the cut margins of the Right Atrial Wall with the Posterior Wall of the right atrium along the groove of Sondergaard. This technique not only helped in closing the Atriotomy but also reduced the size of the usually grossly enlarged Right Atrium in a heart with ASD. The Atriotomy was closed in a single layer, in continuous suturing technique using 4-0 or 5-0 polypropylene sutures. The same suture that was used for closing the ASD could be used for closing the Atriotomy after completion of knotting (Fig 1; Image-F).

After standard de-airing, the aorta was unclamped,

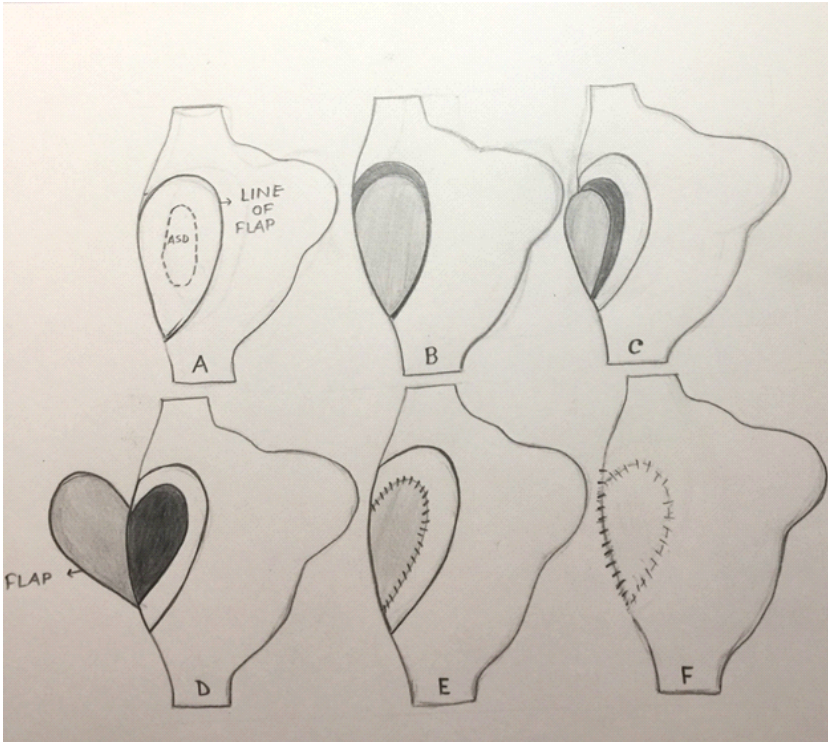

Fig 1

and the patient was weaned from CPB. Intraoperative assessment of the repair was done using Transoesophageal Echocardiography (TEE).

All the patients were re-assessed by Transthoracic Echocardiography prior to their discharge. The repair of the defect and the Cardiac functioning was found to be satisfactory in all the patients. All the patients were discharged either on the 3rd or 4th postoperative day, the mean was 3.7 ± 0.46 days (Mean±SD). All the patients received diuretics for 3 months after surgery. Two patients who presented with mild to moderate Pulmonary Arterial Hypertension (PAH) were prescribed sildenafil at the time of discharge. There was no mortality.

Results and Analysis

All our patients were isolated cases of ostium secundum type of ASD without any other associated Cardiac anomaly. Two patients presented with mild to moderate PAH and none of them had features of Congenital Cardiac Failure. There were 7 male patients (29.16%) & 17 female patients (70.83%). The mean age was 25.2 ± 12.43 years (mean ± SD) and range was 5 to 51 years. All our patients had an uneventful intraoperative period. The mean aortic cross-clamp time was 13 ± 2.99 minutes (Mean ± SD) and the range was 8 minutes to 18 minutes. The mean duration for CPB was 46.5 ± 10.23 minutes (Mean ± SD) and the range was 30 minutes to 65 minutes.

The postoperative period was also uneventful in all our patients. The patients were discharged on 3rd or 4th postoperative day; the mean was 3.7 ± 0.46 days (Mean ± SD). We had no mortality. Prior to discharge, the surgical repair was reassessed using Transthoracic Echocardiogram in all the patients. The repair was found to be satisfactory in all the patients. There was no residual shunt, Peri-flap Thrombosis or Cardiac dysfunction in any of the patients.

Follow-Up: All the patients were followed up in Outpatient Department after 1 month, 3 months, 6 months and thereafter, yearly intervals. The patients were assessed clinically, and investigations such as Electrocardiograms, Chest X-ray & Echocardiograms were done in each follow up. The mean duration of follow-up was 27.66 ± 10 (Mean ± SD) and it ranged between 13 months to 4 years. In 3 patients (12.5%) were followed up for 4 years or more, 11 (45.83%) were followed up for 2 years or more, and 10 (41.66%) were followed up for less than 2 years. Overall, we had a 100% follow-up and it was satisfactory in all patients.

All patients had Sinus Rhythm in ECG. The Echocardiographic examination, which was done in all the patients, in their latest follow-up showed normal Cardiac functioning without any evidence of flap Dehiscence or shrinkage, neither was there any Thrombosis around the flap. The thickness of the flap at the repair site was like the rest of the Interatrial Septum. All were in New York Heart Association (NYHA) functional class-I and there were no Thromboembolic complications.

Discussion

Talwar *et al*[1] had advocated that free right atrial wall was a suitable patch material to close large ASDs. They also concluded that the Right Atrium is generally large in these patients and obtaining a patch of Atrial wall is easy without compromising on the right Atrial volume. The advantages of using this patch have been the avoidance of prosthetic material, viability, absence of tissue reaction and ease of handling and elasticity[2,3]. The endothelialized surface of the right Atrial patch, which is positioned toward the left atrium, may provide freedom from Thromboembolic complications.

Darcin *et al*[3] concluded in their study that Autologous right atrial patch is an ideal material for ASD closure, especially in patients having a large right atrium. A complete coaptation was achieved because of the muscular nature of the right atrial tissue and its thickness, which is a closer match to the atrial septum than other materials.

Conclusion

It is evident from this study that the novel surgical technique of closure of ASD using a pedicled flap of the right atrial wall in an excellent alternative to the currently used surgical techniques. It had several advantages over the conventionally used patches such a pericardium or Dacron. The advantages included but not limited to, easy tissue handling and minimal tissue reaction, avoidance of thrombus formation around the patch, no evidence of patch dehiscence or new onset arrhythmia. On follow-up all our patients had excellent prognosis.

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Original Article

Correlation of Red Blood Cell Indices and RBC Histogram with Peripheral Blood Smear Findings in Anemia

Bansuri Bharatkumar Patni[1], Asha Poonamchand Purohit[2], Madhur Yogendra Modi[3], Vipul Bachubhai Prajapati[4]

The advent of automation has made diagnosis of Anemia and to some extent its underlying cause easy. The objective of our study is to correlate RBC indices and RBC Histogram findings with peripheral smear to provide a better approach in accurate diagnosis of Anemia and to analyze their limitations. All cases of Anemia as per WHO reference range of Hemoglobin levels were included in our study. Patients who have received medical treatment for Anemia in past three months, patients having recent history of blood transfusion, patients having Leukemia or Leukemoid reactions were excluded from the study. Venous blood samples collected from these patients were run in SYSMEX automated hematology analyzer and complete blood count, Red Blood Cell (RBC) indices ie, Mean Corpuscular Volume (MCV), Mean Corpuscular Hemoglobin (MCH), Mean Corpuscular Hemoglobin Concentration (MCHC), Red Cell Distribution Width (RDW) and RBC Histogram were obtained and peripheral smears were examined. Anemia typing was done based on RBC indices and position, shape and skewing of RBC histograms, followed by peripheral smear examination for morphological typing of Anemia. The diagnoses made by peripheral smear versus RBC histogram and indices were compared and analysed.

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Key words **: Automated hematology analyzers, Microcytic hypochromic anemia, Macrocytic anemia, Dimorphic population.**

Anemia is not a disease but manifestation of disease and is major global health condition, especially in India and other developing countries, despite the fact that this problem is largely preventable & easily treatable. About 30%, ie, 1/3rd of World's population is suffering from Anemia owing to various causes[1]. According to the 5th National Family Health Survey (NFHS-5) data, released by the Ministry of Health and Family Welfare, India has the highest total prevalence of Anemia at 39.86 per cent in the World. NFHS-5 data also suggested that more than half of the children and women are anemic in 13 out of the 22 States/ Union territories in the country[2].

Hemoglobin binds with oxygen in the lungs and carries it to various tissues and organs throughout the body. In simple words anemia is defined as decrease in the capacity of the blood to carry oxygen due to decrease in hemoglobin concentration of the red blood cells, decrease in the packed cell volume below the lower limit of the reference interval for the individual's age, gender, geographical location and physiological status[3,4] as per WHO reference range.

Editor's Comment :

- RBC indices along with the Histogram patterns give an idea about the type and to some extent the likely cause of anemia. However, peripheral smear examination is always must to confirm the diagnosis.

Technology and quality control play an important role towards meeting the targets of diagnosis and treatment of Anemia. The conventionally used manual methods have now been vastly replaced by Automated Hematology Analyzers.

The Automated Hematolyzers are based on electronic impedance principle which explains that as each cell passes through an aperture, there is a change in conductance which leads to development of an electrical impulse. The amplitude of this impulse denotes the cell volume and the number of impulses indicates the cell count. The results are displayed as numericals and Histogram.

Histograms are the graphical representation of numerical data of cell populations in a cell counter. X-axis represents cell size and Y-axis indicates the number of cells.

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The normal RBC distribution curve is Gaussian (bell-shaped) curve, the peak of which lies within the normal MCV (mean corpuscular volume) range of 80-100fL. MCV is a perpendicular line drawn from peak of the curve to the base. The curve has two flexible discriminators: Lower Discriminator, LD (25-75fL) and Upper Discriminator, UD (200-250fL). Red cell distribution width, RDW indicates the degree of Anisocytosis and is determined by calculating the width of the RBC Histogram, expressed as CV (co-efficient of variation) or SD (standard deviation). However, RDW-CV is a better indicator of Anisocytosis than RDW-SD[5].

RBC Histogram is a standard part and is routinely generated by Automated Hematology Analyzers[6,7]. The well known Coulter Principle based on counting and sizing of cells forms basis of generating a Histogram[8].

Histogram and other complete blood count parameters provide useful information in various abnormal hematological conditions by[9]:

(1) Checking the reliability of the results provided by the analyzer.

(2) Investigating the potential cause of the ambiguous automated results.

(3) Pointing towards probable diagnosis and treatment of various disorders[10].

The automated analyzer generated RBC indices along with RBC Histograms based on forward scatter and side scatter in conjunction with peripheral smear examination aids in accurate morphological typing, diagnosis of Anemia and monitoring response to treatment.

However, it must be borne in mind that automation is no replacement for peripheral smear examination; it just compliments manual microscopy[11].

Materials and Methods

This study was carried out in Hematology laboratory, Department of Pathology in GCS Medical College, Hospital and Research Centre, Ahmedabad over a period of one year from August, 2020 to August, 2021. Total 150 patients of Anemia were considered for the study.

The study population included all patients with Anemia as defined by WHO reference range as follows:

- Children ½ -5 years(Hb < 11gm/dL)
- Children 5-11years(Hb < 11.5 gm/dL)
- Children 11-15years (Hb< 12 gm/dL)
- Pregnant females(Hb<11 gm/dL)
- Non-pregnant females(>=15 years)(Hb<12 gm/dL)
- Males (>=15 years)(Hb<13 gm/dL)

The following patients were excluded from the study:

- Patients who have received medical treatment for Anemia in past three months.
- Patients having recent history of blood transfusion.
- Patients having leukemia or Leukemoid reactions.

Venous blood samples collected in EDTA vaccute were run in SYSMEX XT-2000i 5-part Automated Hematology Analyzer and complete blood count, red blood cell indices (MCV, MCH, MCHC, RDW) and RBC Histogram was obtained. Peripheral blood smears were stained with BEACON-field stain. It comprises of Field-A (Methylene Blue) and Field-B (Eosin). The smears prepared were air dried and fixed in methanol for 2-3 seconds and were dipped in Field-B for 5-6 seconds followed by Field-A for 10-30 seconds and were examined for the morphological typing of anemia.

Anemia was categorized based on RBC indices as:

- Normocytic Normochromic(MCV between 80-100fL)
- Microcytic Hypochromic(MCV<80fL)
- Macrocytic Normochromic (MCV>100fL).

Various Histogram patterns generated were as follows:

Normal curve : Bell shaped curve from 55-125fL and peak between 80-100fL (Fig 1).

Left shift : Peak of the curve is seen before 80fL (Fig 2).

Right shift : Peak of the curve is noted beyond 100fL.

Broad Base : The curve starts before 55fL and ends after 100fL, indicates high RDW.

Bimodal : Two peaks noted.

Short Peak : The curve starts and ends within an interval of 30-40fL ie, maximum populations of cells are of same size and the height is less than half of the reference peak and a narrow constraint of Histogram is obtained indicating a single lineage or Homogenous RBC population and low hemoglobin and red cell count[12,13].

Morphological typing of Anemia was obtained by peripheral blood smear examination and it was categorized based on size of small lymphocyte (7-10 micron) and RBC central pallor. Anemia was classified as Microcytic Hypochromic when RBC size was less than small lymphocyte and central pallor >1/3rd, Normocytic Normochromic when RBC size was equal to small lymphocyte, Macrocytic Normochromic when RBC size was more than small lymphocyte and

Dimorphic when dual RBC population was seen.

Diagnosis made by peripheral smear versus RBC Histogram and indices was compared, analyzed and correlation was done using Chi square test for their statistical significance.

Observations

Total 150 Anemia patients included in the study were categorized according to their age. Majority of cases ie, 59 cases (39.33%) were found in the age group of 19-36 years followed by 35 cases (23.33%) in the age group of 55-72 years (Table 1).

Out of these 96 cases (64%) were females and 54 cases (36%) were males with male:female ratio of 0.5:1. Majority of these females (62.5%) were from reproductive age group ie,15-45 years. The male population was more commonly affected in the elderly age group of 55-72 years.

In our study, most commonly observed histogram abnormality was left shift in 40.67% cases followed by normal curve in 28.67% cases, right shift in 12% cases, broad base in 12% cases, bimodal peak in 4.67% cases and short peak in 2% cases (Table 2).

Categorization of anemia based on peripheral smear examination was done and most commonly obtained morphological type of anemia was Microcytic Hypochromic 74 cases (49.33%) followed by Normocytic Normochromic 48 cases (32%), macrocytic normochromic 22 cases (14.67%) and dimorphic Anemia in 6 cases (4%) (Table 3).

The diagnosis made by RBC indices and Histogram were compared with peripheral smear findings.

Out of 72 cases of Microcytic Hypochromic Anemia, 60 cases had a left shift, 7 cases showed a broad base, 5 cases had a normal curve, 1 case showed short peak and 1 case showed Bimodal curve.

Out of 48 cases of Normocytic Normochromic Anemia, 38 cases showed normal curve, whereas 6 cases had a broad base curve.

Out of 22 cases of Macrocytic Normochromic Anemia, 17 cases showed a right shift, 4 cases showed broad base curve and 1 case showed Bimodal curve.

Out of 6 cases of Dimorphic Anemia, 5 cases showed Bimodal peak and 1 case showed a broad base.

The impression made by peripheral smear V/S RBC histogram and indices were statistically analyzed and correlated using Chi-square test which was statistically highly significant, p<0.0001 (Table 4).

Table 1 — *Age distribution of the patients studied*

Age Group	Number of Patients	Percentage (%)
≤18 years	20	13.33
19-36	59	39.33
37-54	27	18.00
55-72	35	23.33
73-90	9	6.00
Total	150	100.00

Table 2 — *Distribution of RBC histogram curves*

Types of Histogram Abnormality	Cases	Percentage%
Normal curve	43	28.67
Left shift	61	40.67
Right shift	18	12.00
Broad base	18	12.00
Bimodal	7	4.67
Short peak	3	2.00
Total	150	100.00

Table 3 — *Categorization of Anemia Based on Peripheral Smear Examination*

Peripheral Smear Examination	Number of Patients	Percentage(%)
Microcytic Hypochromic	74	49.33
Normocytic Normochromic	48	32.00
Macrocytic Normochromic	22	14.67
Dimorphic	6	4.00
Total	150	100.00

Discussion

In present study, amongst the Anemia cases in various age groups, maximum cases obtained were in the age group of 18-36 years with majority of them being females. It clearly indicates that Anemia is more common in adolescent girls and females of reproductive age group, either due to increased demand as in adolescence and pregnancy or loss due to menstruation. Similar findings were obtained by Sandhya *et al* in their study[14].

In our study, majority of cases observed were Microcytic Hypochromic followed by Normocytic Normochromic, Macrocytic Normochromic and Dimorphic anemia. Similar findings were seen in Sandhya *et al*[14] and Rao *et al*[15] in their studies.

Table 4 — *Correlation between RBC indices and Histogram generated by automated analyzer and peripheral smear findings*

Automated analyzer generated RBC indices and Histogram Pattern							
Anemia type of Peripheral Blood smear	Bimodal	Broad base	Left shift	Normal curve	Right shift	Short peak	$\chi 2$ test statistics
Dimorphic	5	1	0	0	0	0	(p-value)*
Microcytic Hypochromic	1	7	60	5	0	1	
Macrocytic Normochromic	1	4	0	0	17	0	300.05
Normocytic Normochromic	0	6	1	38	1	2	(0.00001)

*Here p-value is highly significant which suggest that there is association between type of anemia, Peripheral Smear and Pattern of Histogram.

However, in our study, the cases of Macrocytic Anemia were more compared to Dimorphic Anemia as the study was carried out in Gujarat where majority of the population followed a vegetarian diet and B12 deficiency is quite common.

In cases of Microcytic Hypochromic anemia, MCV and MCH were decreased but MCHC was normal and hence RBC Histogram showed left shift as in majority of cases. A broad base curve was due to high RDW and indicated Anisocytosis. In such cases, presence of elliptocytes or tear drop cells points towards iron deficiency. However, a Microcytic Hypochromic picture with normal RDW and presence of significant number of target cells points towards beta-thalassemia trait. One of the cases showed presence of many platelet clumps where the lower discriminator of RBC curve didn't touch the baseline giving a left skewing and a broad base. Presence of Schistocytes in cases of Hemolytic Anemia may also lead to a histogram where the Lower discriminator fails to touch the baseline and RDW may be raised due to presence of Polychromatic RBCs. Such conditions can be ruled out by peripheral smear examination. Few cases showed a normal curve and this might be due to the fact that MCV is a mean of distribution curve and so it is insensitive to small number of Macrocytes and Microcytes[16]. One case showed Bimodal curve which on peripheral smear showed presence of Microcytic and Macrocytic red cells indicating mixed nutritional deficiency. The short peak correlated well with low RBC mass and low Hemoglobin[12]. These findings correlated with study carried out by Sandhya *et al*[14] and Rao *et al*[15].

In Normocytic Normochromic Anemia, MCV, MCH, and MCHC were normal producing a normal Histogram curve. Few cases showed mild increase in RDW giving a mild broad base curve. One case showed right shift and this may be due to presence of few Macrocytes along with the normal red cell population. The decrease in RBC mass and hence the count caused short peak in some cases.

In Macrocytic Anemia, there is increase in MCV and MCH with normal MCHC and curve shifts to right due to presence of Macrocytes. Few cases showed broad base curve due to elevated RDW. However, one case showed Bimodal pattern on Histogram. This difference in the categorization was due to mis-interpretation of cases of Hemolytic Anemia as macrocytic anemia due to the presence of polychromatic RBCs which are larger in size compared to mature RBCs, and since MCV is an average of RBC size, it fell towards the higher side. However peripheral smear picture confirmed the presence of nucleated RBCs and Schistocytes indicating hemolytic cause. Few cases observed as Macrocytic Anemia on Histogram and RBC indices analysis were actually Dimorphic on peripheral smear examination.

In Dimorphic Anemia, there were dual cell populations and hence the Histogram had two distinct peaks. There may be admixture of Normocytic and Microcytic or Normocytic and Macrocytic red cells. In the present study, in cases of Dimorphic Anemia, MCV, MCH and MCHC were nearly normal and RDW was markedly high due to severe anisopoikilocytosis. The most common reason for Dimorphic Anemia may be mixed nutritional deficiency. Out of total 6 cases of Dimorphic Anemia, majority of them showed bimodal curve and one case showed a broad based curve. The dual RBC population is usually associated with therapeutic blood transfusions, hematinic response to Anemia, etc. They may also denote other hematological conditions like early iron deficiency or folate/vitamin B12 deficiency, iron deficiency in a patient with Megaloblastic Anemia or B12/folate deficiency in a patient with iron deficiency anemia. Dimorphic Anemia is abroad entity and hence a smear is mandatory to assess the abnormal cells.

Hence, Histogram can be considered as an early predictor in identifying subclinical cases of anemia, as well as an important clue towards erroneous results. In our study, Histogram changes correlated well with peripheral smear findings in majority of the cases [14,15].

Conclusion

The present study is the comparison between automated and manual methods for accurate diagnosis of Anemia. While the automated analyzer generated indices give nearly accurate results, it must be borne in mind that various abnormal findings like Hyperglycemia, severe Leukocytosis, cold Agglutinins may lead to false rise in MCV. Likewise, presence of nucleated RBCs, Polychromatophils, Schistocytes might give erroneously normal indices with significantly elevated RDW and an abnormal Histogram pattern, in which case a peripheral smear examination can point to diagnosis of Hemolytic Anemia. Presence of platelet clumps, bacteria, malarial parasites, etc might produces flagging which should be ruled out. The indices are basically an average of the different populations of RBCs and hence presence of extreme populations might affect the indices in a way that it may fall in normal range or may show extreme deviation. The importance of Histograms comes to play here as it gives a rough idea about the deviations from normal and to some extent can help predict the likely

cause of the type of anemias. In any cases, examination of peripheral blood smear is mandatory to rule out such findings, to get a clear picture of the type of anemia as well as to monitor the response to treatment.

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Original Article

Prevalence of Common Infections and Flare-ups in on-treatment SLE Patients Attending Two Tertiary Care Hospitals in Kolkata

Sagnik Sur[1], Sudeshna Mallik[2], Amartya Kumar Misra[3], Mehebubar Rahman[4], Parasar Ghosh[5], Rama Prosad Goswami[6]

Systemic Lupus Erythematosus (SLE) is a multisystem autoimmune disease. Infections are the most common complications. Early detection, proper management of infection and its differentiation from Lupus flare are of paramount importance.

Objective : To find out the prevalence of infections with various etiologic agents among on-treatment SLE patients who were hospitalized for suspected infections and to differentiate infections from disease flare.

Methods : This was a cross-sectional observational study with 50 patients of more than 16 years of age of both sexes fulfilling the Systemic Lupus International Collaborating Clinics (SLICC) 2012, classification criteria of SLE who were admitted for suspected infection as manifested by fever and systemic symptoms. Specific tests to identify etiological agent for infection were performed and the condition was differentiated from lupus flare with the help of the tests such as Total Leucocyte Count (TLC), C-reactive Protein (CRP), Anti-ds DNA, complements-C3 and C4.

Result : Infections were evident in 42 patients (84%) with predominant monoinfection being pneumonia in 13 patients (30.9%) followed by Urinary Tract Infection (UTI) in 8 patients (19%). *Streptococcus pneumoniae* was the major cause of Pneumonia while *Escherichia coli* caused most of UTIs. The infection markers were fever, CRP and TLC. Of the 42 patients, 40 patients (95%) had fever, 28 (66.7%) had Leukocytosis and 35 (83%) had CRP 10 mg/L or more indicating infection. Anti-ds DNA antibody was raised in 4 patients out of total 6 patients with Lupus flare. The complements C3 and C4 values were low in all the 6 patients. No patient of disease flare had raised CRP or Leukocytosis

Conclusion : Among 50 on-treatment SLE patients who were admitted in two Tertiary Care Hospitals of Kolkata with suspected infection it was found that 42 patients were having infections and 6 patients were suffering from Lupus flare. The predominant monoinfection was Pneumonia followed by UTI.

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Key words **: Systemic Lupus Erythematosus, Infection, Lupus flare.**

Systemic Lupus Erythematosus (SLE) is an autoimmune disease in which cellular damage occurs by tissue-binding antibodies and immune complexes. The prevalence is highest in women of child-bearing age[1].

Infections and SLE :

Various infectious agents are involved in the pathogenesis of SLE due to abnormal production of autoantibodies. The potential mechanisms include (Fig 1)[2].

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Editor's Comment :

- SLE patients are usually maintained on disease remission with lowest possible dose of glucocorticoids mainly prednisolone and other immunosuppressants like Hydroxychloroquine, Mycophenolate Mofetil, Cyclophosphamide etc. They may come back with fever and other systemic symptoms of suggesting infections.
- Detection of specific infection is as important as diagnosing disease flare in this situation as the later is not very uncommon. Moreover disease flare is managed by increasing the dose of corticosteroids with or without addition of other immunosuppressant but infection is treated by use of appropriate antimicrobials.

Apart from these, infections are among the most common complications of SLE. The most serious organ disease that occurs in SLE is nephritis. Nephritis and infections are leading causes of mortality in the first decade of disease[1].

The pattern and etiology in various infections are very important. Pneumonia, UTI, Skin and Soft tissue infections are the most common infections for hospitalization of SLE patients and Bacteremia and Sepsis are the most common causes of in-hospital mortality.

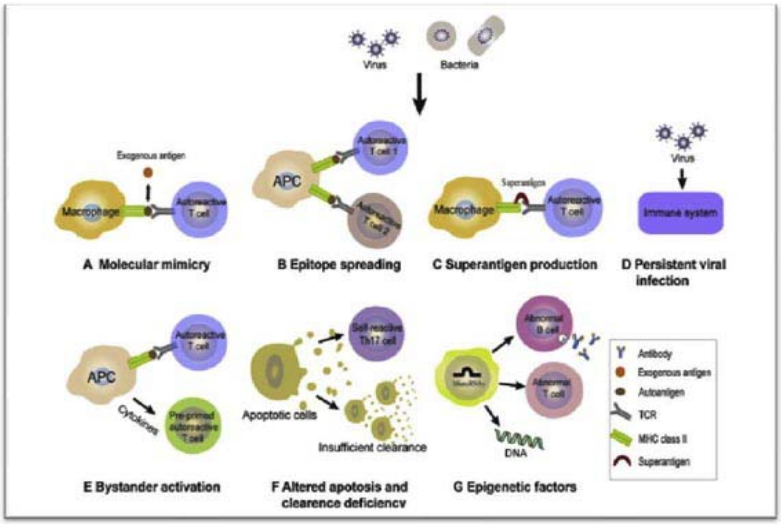

Fig 1

The risk factors for pre-disposition of SLE patients to various infections are: [3]

- Use of corticosteroids and other immunosuppressives
- Complement deficiencies
- Organ involvement such as kidney disease
- Functional hyposplenia
- Severity of disease activity.

Infecion and Lupus Flare :

A SLE patient with infection usually presents with fever with or without system specific signs and symptoms. However, a patient with increased disease activity denoting SLE flare also can present in a febrile state. Thus although it is difficult to distinguish an ongoing infection in SLE patient from a SLE flare, a clear distinction must be made as treatment of one is different from the other. An infection needs treatment with antimicrobials whereas in Lupus Flare, immunosuppressive agents are indicated. Several biochemical markers are used to distinguish between them[4].

Material and Method

This cross-sectional observational study was conducted in the Department of Tropical Medicine, School of Tropical Medicine and Department of Rheumatology, IPGME&R from July, 2019 to June, 2020. The aim of the study was to assess the prevalence of infection among SLE patients hospitalized for suspected infection to find out the sites and the causative organism of infection and to differentiate infection from disease flare.

The study included 50 patients of more than 16 years of age of both sexes fulfilling the SLICC 2012 classification criteria of Systemic Lupus Erythematosus who were regularly being followed up at OPD of above two hospitals and admitted for suspected infection manifested by fever and symptoms like headache, cough with or without expectoration, pain abdomen, diarrhea, vomiting, burning sensation during micturition. The patients with Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) co-infections, current or past malignancy within the past 5 years and pregnant or lactating women were excluded from the study. Predesigned proforma for data collection was used and informed consent was obtained. Detailed medical history, physical examination comprising of general survey and systemic examination and specific tests necessary for detection of infection were performed and TLC, CRP, Anti-ds DNA, complements-C3 and C4 were assessed to identify disease flare. Ethical clearance was obtained from Clinical Research Ethics Committee (CRE-STM), School of Tropical Medicine.

All the 50 patients recruited for study were getting maintenance dose of prednisolone as shown in Table 1.

Along with the maintenance dose of pre-dnisolone the recruited patients were also getting other immunosuppressive drugs like Table 2.

Observation

The following infections were detected among 42 patients who were diagnosed to have infections (Table 3).

Documented evidence of infection was obtained in 42 patients (84%) with the Predominant monoinfection being pneumonia in 19 patients (45.2%) followed by UTI in 8 patients (19%). The other

Table 1 — *Prednisolone dosage*

Prednisolone dosage	Number of patients (n=50)
5 mg	2
7.5 mg	24
10 mg	21
15 mg	2
20 mg	1

Table 2 — *Immunosuppressants*

Immunosuppressants	Number of patients (n = 50)
Mycophenolate mofetil	13
Hydroxychloroquine	50
Cyclophosphamide	7
Cyclosporine	0
Dapsone	2
Rituximab	3
Tacrolimus	1
Azathioprine	0

monoinfections which followed suit were Extrapulmonary Tuberculosis (EPTB) in 4 patients (9.5 %), cellulitis in 3 patients (7.1 %), oral candidiasis (OC) in 3 patients (7.1 %), pulmonary tuberculosis (PTB) in 2 patients (4.7 %) and 1 case each of Esophageal Candidiasis (EC) and Upper Respiratory Tract Infection (URTI). There were also evidence of mixed infections, Predominant being a combination of pneumonia and UTI in 3 patients (7.1%). There were 5 cases of EPTB with 4 of them as monoinfection out of which 3 had pleural effusions and 1 had Ascites. The patient with dual infection of EPTB and Scrub Typhus also had pleural effusion. There was a case of Pneumonia which progressed to Sepsis, a case of Pneumonia with cellulitis and another case of pneumonia with coinfection with Gluteal Abscess (Table 3).

Diagnosis of Pneumonia was supported by typical clinical features along with biochemical and radiological evidence of lung infection. Microorganisms causing Pneumonia were searched for and in a total of 19 cases of Pneumonia, 3 cases were due to *Streptococcus Pneumoniae* and 1 case each of *Pseudomonas Aeruginosa*, *Klebsiella Pneumoniae* and *Staphylococcus aureus*. Culture of sputum sample was done by VITEK method. In 13 cases no organism could be identified (Table 4).

Diagnosis of UTI in 11 patients was evident by typical symptoms of burning sensation during urination with increased frequency of urination in some along with evidence of pus cells in Routine Urine Examination. Urine culture revealed *Escherichia coli* as the commonest pathogen (6 patients) followed by 1 case of *Proteus Mirabilis* infection and 1 of *Enterobacter sp*. In 3 cases no organism could be identified.

The markers of infection were presence of fever along with rise in CRP values and Total Leucocyte Count. In our study out of the 42 patients with infection,

Table 3 — *Types of infection*

Infection	Number of patients (n=42)
Cellulitis	3
Upper respiratory tract infection	1
Pneumonia	13
Extrapulmonary tuberculosis	4
Pulmonary tuberculosis	2
Urinary tract infection	8
Oral candidiasis	3
Esophageal candidiasis	1
Cellulitis with pneumonia	1
Extrapulmonary tuberculosis with scrub typhus	1
Pneumonia with bacteremia	1
Pneumonia with UTI	3
Pneumonia with gluteal abscess	1

Table 4 — *Microorganisms causing pneumonia*

Microorganism causing pneumonia	No of patients (n=19)
Streptococcus pneumoniae	3
Pseudomonas aeruginosa	1
Klebsiella pneumoniae	1
Staphylococcus aureus	1
No organism identified	13

40 patients (95%) had fever, 28 patients (66.7%) had leukocytosis and 35 patients (83%) had CRP values ≥10 mg/L indicating infection. Combination of the above markers is better than a single marker for diagnosis of infection (Fig 2).

The patients of suspected infection should be differentiated from disease flare. In our study subjects among 6 patients of Lupus flare the value of anti-ds DNA antibody was raised in 4 patients. The values of C3 and C4 complements were less than the normal in all the 6 patients. No patient had CRP value greater than 10 mg/L and no patient had Leukocytosis. 3 patients had the WBC count in the normal range while 3 patients had Leukopenia (Fig 3).

Discussion

In our study population of 50 patients a definitive diagnosis could be achieved in all the patients. 42 patients (84 %) had various types of infections and 6 patients had Lupus flare. One patient had Kikuchi's disease for which diagnosis was on the basis of Histopathology but the etiological agent could not be identified. One patient who presented with respiratory distress without fever had evidence of right lung middle lobe collapse on his chest radiography. The cause of the collapse was undiagnosed as the patient took discharge against medical advice.

Documented evidence of infection was obtained in 42 patients (84 %) with the predominant monoinfection being pneumonia in 19 patients (45.2%) followed by Urinary tract UTI in 8 patients (19%). The other

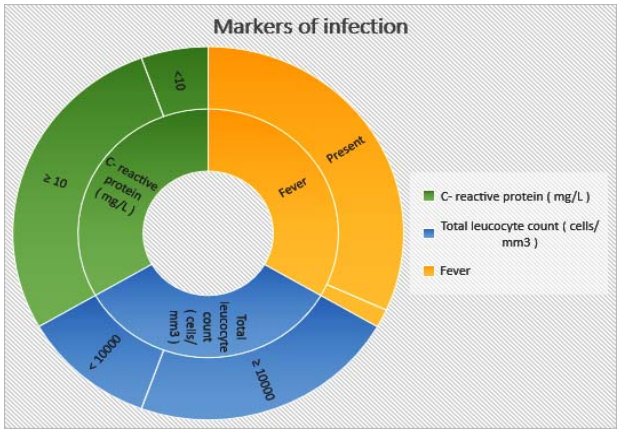

Fig 2 — Markers of infection

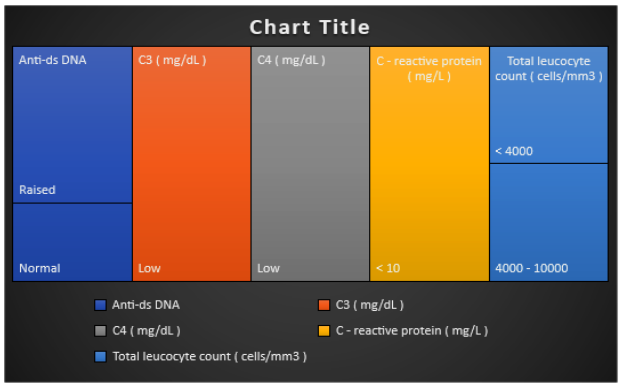

Fig 3 — Markers of lupus flare

monoinfections which followed suit were EPTB in 4 patients (9.5%), Cellulitis in 3 patients (7.1%), OC in 3 patients (7.1%), PTB in 2 patients (4.7%) and 1 case each of EC and URTI. There were also evidence of mixed infection, predominant being a combination of Pneumonia and UTI in 3 patients. There were 2 cases of mixed infection, one being Pneumonia and Cellulitis and another being Pneumonia and gluteal abscess. One of the cases of Pneumonia progressed towards bacteremia causing sepsis. There was one instance of EPTB who also had scrub typhus infection. Jung et al[4] found 120 cases of infection in his case-control study. Jeong *et al*[5] found predominant infection to be Pneumonia. Teh *et al*[6] also found the predominant infection to be Pneumonia followed by Septicemia. In a nested case control study by Ruiz-Irastorza et al[7] there were 83 instances of infection with most common being Pneumonia in 34 cases.

The patients who presented with symptoms and signs of suspected infection had to be differentiated from Lupus flare. The identifying markers of lupus flare were a raised anti-ds DNA antibody, low complements C3 and C4 and normal CRP and TLC.

The traditional markers of infection were presence of fever, high Leucocyte count and high CRP were used to provisionally diagnose patients with suspected infection and diagnosis was facilitated by radiological evidence and microbiological confirmation wherever possible. In our study out of the 42 patients with infection, 40 patients had fever, 28 patients had leukocytosis and 35 patients had CRP value ≥10 mg/L. A study by Jung *et al*[8] in 2017 reported high Leucocyte Count, high C-reactive Protein (CRP) and high ESR as the markers of infection.

In our study we found that out of the 6 patients with lupus flare, while all of them had low complements C3 and C4 and a normal CRP value, 4 patients had anti-ds DNA raised and in 3 patients Total Leukocyte Count (TLC) was normal while the rest 3 had Leukopenia. Jung *et al*[8] documented in his study suspected lupus flare over infection with reduced Leucocyte count and complements C3 and C4, elevated anti-ds DNA titre and no change in CRP levels.

Differentiating Lupus flare from infection is very much crucial as their treatments are different. A case of infection is treated by Antimicrobials but Lupus flare is controlled by immunosuppressives.

Limitation of our study :

Our study had a few limitations namely a small sample size, short time duration of the study and observational study design. The lack of a specific biomarker to differentiate infection from Lupus flare forced us to judge on the basis of conventional markers along with the clinician's decision for the diagnosis.

Thus there is need for further such studies with improved study design to determine risk factors for infection, early identification of infection and specific differentiating marker between infection and disease flare in SLE for an improved quality of life in these patients.

Conclusion

Among 50 on-treatment SLE patients who were admitted in two Tertiary Care Hospitals of Kolkata with suspected infection it was found that 42 patients were having various type of infections and 6 patients were suffering from Lupus Flare. The predominant monoinfection was Pneumonia followed by UTI.

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Original Article

Impact of COVID-19 on Postgraduate Residency Curriculum of Internal Medicine and Allied Specialities : Outcomes from A Web-based Cross-sectional Study from India

Abheek Sil[1], Puspendu Biswas[2], Atanu Chandra[3], Uddalak Chakraborty[4], Arkapravo Hati[5]

Background : Clinically-based Medical Education is the principal source of learning and this has been profoundly impacted by restrictions due to COVID-19.

Methods : A cross-sectional observational study was conducted to assess the impact of COVID-19 on the different aspects of the Postgraduate curriculum among the residents of Internal Medicine and its Allied sub/super-specialties across India. An online semi-structured English language questionnaire was prepared using Google-form platform and the link was shared among the residents through various social media outlets. The questionnaire comprised of seven sections: demographic characteristics, burden of COVID duties, hospital service utilization, academic activity, procedural training, research activity and recommendations for improvement of academic activities. Appropriate statistical tests were carried out to analyze the data obtained. Results: A total of 1857 responses were taken into consideration. A significant reduction in both out-patient and In-patient Department (IPD) attendance was reported by 47% and 35.3% participants respectively. Most of the residents (69.8%) claimed that their magnitude of self-study was less than usual. Bulk of the respondents (75.4%) felt that their clinical training was being grossly hampered. Three-fourths of the participants were involved in online studies. Procedural training was severely affected as opined by 75.9% of respondents. Majority (55.6%) respondents reported their thesis work was severely affected during pandemic.

Conclusion : The findings of this study highlight the grave implications of the current pandemic on various aspects of the Postgraduate Residency Curriculum. Learning methods applying modern emerging online digital technologies will improve our teaching paradigms.

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***Key words* : COVID-19, Medical education, Postgraduate curriculum, Online study, Research activity.**

The WHO declared the COVID-19 outbreak as a pandemic on 11th March, 2020. Lockdowns were implemented in different parts of the world, including India (from 24th March, 2020 up to 31st May, 2020), to prevent widespread dissemination of the disease. Except the emergency health care services, all other non-emergency Out patient Departments in India were shut[1]. This development has had serious implications on public Healthcare Institutions and caused amassive disruption in Medical Training and Education Worldwide[2]. Although Postgraduate Residents stand to learn a tremendous amount and can contribute to the care of patients; the more pressing concern among residents is the impact of COVID-19 on the residency programme[3].

Editor's Comment :

- COVID-19 pandemic has severely compromised the medical postgraduate academic curriculum due to increased burden of COVID related duties, underutilization of hospital services, barrier to academic activities and research.
- Trainees of different specialties have been redeployed to COVID-19 related duties or other specialties, and they have experienced significant reduction in their bedside and clinical exposure.
- Regulatory authorities should revise the existing curriculum and adopt accessible technology to meet the demands of the present times.

Experiences from previous disruptions to Clinical Medicine Curriculum and their effects have been described in the literature. Medical students from Severe Acute Respiratory Virus (SARS)-affected (2002-2004) countries were barred from direct in-person patient care. Alternate virtual course work such as e-learning methods, virtual reality simulators and video vignettes were adopted. Similar measures were adopted in certain regions during the Middle Eastern Respiratory Syndrome (MERS) Pandemic[4,5].

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Given the social distancing recommendations, the corona virus emergency has led to presence of limited number of on duty residents, cancellation of lectures and educational conferences to adhere to strict social distancing norms. The academic activities including face-to-face teaching have been discontinued and the clinical rotation within the Different Departments of the same institution was interrupted. In addition, the residents are being designated for managing patients in COVID Wards, Fever clinics, Screening blocks and Intensive Care Units (ICU) in apart from their regular duties which have ultimately increased the workload. This has led to an increased prevalence of depression, anxiety and acute stress among the Residents[6-8].

Postgraduate Medical Education and training is multifaceted where commitments to clinical education,research, self-study, learning of procedural skills, service provision and preparation for assessments must be finely balanced. Recent publications have assessed the link between the COVID-19 pandemic and clinical training. However, these studies have primarily covered surgical specialties[9,10]. As the COVID-19 outbreak had a massive impact on the clinical exposure of the residents, this pan-Indian study aimed to assess the impact of COVID-19 on the various aspects of the Postgraduate curriculum of the Residents belonging to Internal Medicine and its Allied Sub/Super-Specialties.

Materials and Methods

A cross-sectional observational study planned, after Institutional Ethics Clearance, among Postgraduate residents throughout the India from 23rd July, 2020 to 16th October, 2020. The study subjects were Medical Residents pursuing their training under Non-surgical departments across the Countries. The minimum sample size of this study was 1803. This was calculated using the formula of sample size= $Z^2p(1-p)/(p)^2$, where Z=1.96, constant value at 95% confidence interval, p= proportion of perceived burden of duties among Medical Residents during COVID pandemic taken as 50% to achieve maximum sample size, ε relative precision of 7% with design effect of 2 and 15% drop out also being taken into consideration.

An online semi-structured English language questionnaire was prepared using Google-form platform (www.googleforms.com). The survey questions underwent face and content validation by three independent Medical experts and pilot tested. Further, any feedback of the experts was discussed by the authors and necessary changes to the questionnaire were made. The link of this questionnaire was shared among the residents through E-mails, WhatsApp messenger, Telegram and other social media and also requested for link referral for such kind of participants. Thus, the selection of the subjects wasplanned through snowball sampling method. It started from 23rd September, 2020, 10:00 hours and closed 16th October, 2020, 10:00 hours. On receiving and clicking the link, the participants were auto-directed to be informed with some brief essential information about the study and after that they answered a set of questions on giving informed consent.

The questionnaire consisted of 24 items under seven broad categories: (A) Demographic characteristics (age, gender, type of residency course, year of residency training, enrolled Department of Residency, Type of Training Institute, Geographical Zone of Residency); (B) Burden of COVID duties[place of COVID duty, type of duty, workload during COVID pandemic;(C) Hospital Service Utilization [Utilization of Departmental IPD for COVID, OPD attendance reduction, IPD attendance reduction]; (D) Academic activity [Effect on Self-study, Effect on Clinical Training, Effect on Departmental Academic Activities, participation in virtual platforms, opinion on pandemic's effect over academic curriculum; (E) Procedural training [magnitude of procedures being performed, effect on procedural training] (F) Research activity [effect on thesis work, involvement in other research activities, contribution on COVID-19 research] and (G) Opinion regarding recommendations for academic activities and curriculum in COVID pandemic situations.

The data was collected in the linked Google sheet of the Google form. Data was checked for completeness and consistency, and organized using Microsoft Excel 2010. Both quantitative and qualitative analysis of data performed. Descriptive and inferential statistical analysis was performed using SPSS version 20 software. Relationship between the demographic characteristics and other categories of variables were done using chi-square test as test of significance.We considered $p<0.05$ as significant.

The opinions regarding recommendations for academic activities & curriculum in COVID pandemic situation were analyzed qualitatively through coding of textual data and presented through word cloud using 'Worditout'online platform. Confidentiality and anonymity were strictly maintained.

Results

A total of 1893 responses were received, of which 36 were found to be incomplete for multiple variables and therefore discarded. The final 1857 responses were considered as the study population.

[A] *Demography :*

The study population showed a predominance of male subjects (1307, 70.4%) that belonged to the age category ≤30 years (1542, 83%). The mean age ±SD and median age (IQR) of the study participants were 28.25±3.49 years and 27[3] years respectively. Most of the participants were Postgraduate Students of Government Institution (1353, 72.9%) and pursuing specialization courses (1658, 89.3%). Majority of them were Residents of General Medicine (50.2%). Other demographic characteristics of the study participants have been described in Table 1.

[B] *Burden of COVID duties :*

Out of the total study participants, 1113 (59.9%) were working outside their parent institution while 1024 (55.1%) were exclusively engaged in COVID related duties. Only 872 (47%) participants perceived workload during COVID pandemic to be more than usual. Place of work engagement and burden of workload were significantly associated with the age group, gender, type of the institution, category of residency courses and year of residency (p<0.001). Types of duty during COVID pandemic was found to be significantly associated with the age group, type of the institution, category of residency courses and year of residency (p<0.001) except gender.

Table 1 — *Frequency distribution of the demographic characteristics (N=1857)*

Variables	Frequency (N=1857)	Percentage (%)
Age Group :		
≤30	1542	83
31-45	308	16.6
>45	7	0.4
Gender :		
Male	1307	70.4
Female	550	29.6
Type of institution :		
Government	1353	72.9
Non-government	504	27.1
Category of residency course :		
Specialization Courses	1658	89.3
Super-specialization Courses	199	10.7
Year of residency training :		
1st Year	493	26.5
2nd Year	534	28.8
3rd Year	631	34
Post-MD	199	10.7
Geographical zone of residency :		
Central	18	1.0
East (including north-east)	769	41.4
North	170	9.2
South	90	4.8
West	810	43.6
Total	1857	100

[C] *Hospital Service Utilization :*

Only 681(36.7%) study participants reported non-conversion of their Departmental IPD (In-patient Department) beds for COVID patients. A massive reduction in both OPD (Out-patient Department) and IPD attendance (>50%) was reportedby 872 (47%) and 656 (35.3%) participants respectively. Experience of the utilization of Departmental IPD for COVID patient significantly differed among age group, gender, category of residency courses and year of residency. OPD attendance reduction was significantly associated with age group, gender, type of the institution and category of residency course while IPD attendance reduction was significantly associated age group, type of the institution, category of residency course and year of residency.

[D] *Academic Activity :*

A large proportion (69.8%) of the participants mentioned that their magnitude of self-study was less than usual. Impact on self-study was significantly associated with age group, gender, category of residency course and year of residency. Majority (1401, 75.4%) participants were of the opinion that their clinical training was being severely affected. Impact on clinical training was significantly associated with the age group, gender, type of the institution, category of residency course and year of residency.

Departmental academic activities remained as unaffected overall, as reported by 624 (33.6%) participants. Almost three-fourths of the participants (74.6%) were involved in online studies. Participation in virtual platforms was significantly associated with the age group, category of residency course and year of. Majority (1216, 65.5%) were affirmative to COVID pandemic ill-effect on academic curriculum. Opinion on pandemic's effect over academic curriculum was significantly associated with age group, gender, category of residency course and year of residency.

[E] *Procedural training* :

Most participants (1225, 66%) mentioned a marked reduction in the quantum of procedures performed. Procedural training was severely affected in 1409(75.9%) participants. This was found to be significantly associated with type of the institution, category of residency course and year of residency.

[F] *Research Activity* :

Majority (55.6%) of the respondents reported their thesis work was severely affected during pandemic. Effect on thesis work was significantly associated with the age group, gender, category of residency course and year of residency.Large fraction (78.8%)

participants were not involved in any other research activity. About half the respondents (969, 52.2%) wished to contribute to COVID-related research.

The impact of COVID-19 pandemic on postgraduate residency program related variables and bivariate analysis with respect to type of institution have been summarized in Table 2.

[G] *Recommendations and suggestions of the participants* :

After analyzing all the opinions regarding recommendations for academic activities and curriculum, it became evident that most of them desired online theoretical classes with small group session for clinical and practical classes. Further, they suggested incorporation of a collection of small modules based on formative assignments that would be more time-bound and specific with achievable educational objectivity (Fig 1).

Discussion

The training of the Postgraduate Residents was severely affected during the lockdown and postlockdown period. Besides their institutional duties, most of them were assigned to work in a COVID dedicated Hospital. We found that 416 (22.4%) of the residents were engaged in both COVID 19 related duties and regular Departmental work and 1024 (55.1%) were exclusively COVID related duties. The huge physical and mental stress in treating COVID-19 patients and emergencies besides their scheduled Departmental Duties eventually result into depression[7,8].

The goal of the residency training programs is to enhance knowledge and clinical skills of the residents' by giving them exposure to variety of cases.Case exposure based on seeing a variety of patients with varying acuity levels, chief complaints and diagnoses is crucial for the development of comprehensive experience[11-15]. Additional strain has also been brought about by the need for regular use of hand sanitizers, personal protective equipment (including prophylactic medications) which has led to a multitude of cutaneous and extracutaneous

Table 2 — *Impact of COVID-19 pandemic on postgraduate residency program related variables and bivariate analysis with respect to type of institution. (N=1857)**

Variables	Type of the Institution		
	Government	Non-Government	p-value
Impact on academics			
Effect on self- study:			
Able to study as usual	103 (67.8)	49 (32.2)	0.107
Able to study less than usual	939 (72.4)	358 (27.6)	
Not able to study at all	331 (76.2)	97 (23.8)	
Effect on clinical training:			
Severely affected	1051 (75)	350 (25)	<0.001
Partially affected	262 (64.2)	146 (35.8)	
Not affected	40 (83.3)	8 (16.7)	
Effect on departmental academic activities:			
No academics at all	451 (72.3)	173 (27.7)	<0.001
Partially affected	375 (78.1)	105 (21.9)	
Academic activities in online platforms	511 (71.7)	202 (28.3)	
Unaffected	16 (40)	24 (60)	
Participation in virtual platforms :			
No	340 (72)	132 (28)	0.640
Yes	1013 (73.1)	372 (26.9)	
Opinion on pandemic's effect over academic curriculum:			
Severely affected	906 (74.5)	310 (25.5)	0.057
Moderately affected	351 (70.6)	146 (29.4)	
Not affected	96 (66.7)	48 (33.3)	
Impact on procedure training			
Magnitude of procedures being performed:			
Only lifesaving emergency procedures	317 (74.8)	107 (25.2)	<0.001
After a negative COVID-19 RT-PCR report (reduced capacity)	862 (70.4)	363 (29.6)	
Same as before	174 (83.7)	34 (16..3)	
Effect on procedural training:			
Not affected	78 (81.2)	18 (18.8)	<0.001
Moderately affected	216 (61.4)	136 (38.6)	
Severely affected	1059 (75.2)	350 (24.8)	
Impact on research activity			
Effect on thesis work:			
Severely affected	748 (72.4)	285 (27.6)	0.125
Moderately affected	469 (75.2)	155 (24.8)	
Not affected	136 (68)	64 (32)	
Involvement in other research activities:			
*No	1088 (74.3)	376 (25.7)	0.001
Yes	209 (65.1)	112 (34.9)	
Interest regarding contribution to COVID-19 related research:			
Yes	716(73.9)	253(26.1)	0.001
May Be	390(67.7)	186(32.3)	
No	247(79.2)	65(20.8)	

*(Note: all parenthesis shows row percentages. * For Involvement in other research activities N=1785)*

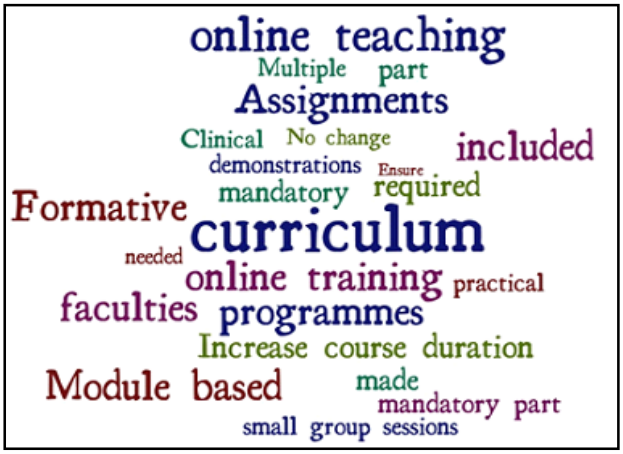

Fig 1 — Word cloud showing summary of the opinions regarding recommendations for academic activities and curriculum in the COVID pandemic situation

problems, apart from being labour intensive[16-18]. A high patient volume exposes the trainees to atypical presentations of common diseases and rare diseases. The reduction in the volume of patients and the diversity of disease pathologies during this COVID-19 pandemic has significantly affected the case exposure of the residents. Inadequate clinical exposure will reduce the learning opportunities for the trainees thus, hindering their attainment of clinical competency[19,20]. Similarly, outpatient volume has drastically reduced during this pandemic and non-urgent outpatient clinic appointments have been cancelled. Fear of having COVID-19 or getting infected by the virus in the hospital could be a reason for reduction in both out-patient and in-patient admissions resulting in a negative impact on residents' clinical learning. Moreover, majority of the in patient beds have been widely re-allocated for the care of COVID patients. The overall reduction in patient volume has reduced opportunities for trainees to perform essential in-patient routine and other special procedures thus reducing their proficiency[20].

Medical conferences fulfill a critically important role in the ongoing education which allows trainees to present their research findings in the form of oral or poster presentations. This will help in the future research, publication and receiving expert opinions in their day to day practice. In this COVID-19 era, there is a transition from traditional in-person gatherings to a virtual platform for safe provision of educational content. Via this virtual platform, residents stand to lose the opportunity to communicate with experts in their respective field which seem much easier in face-to-face events. Most of the in-person Medical Classes are now being replaced by recorded lectures or live streams via online platform which do not include traditional physical examination. Physical examination is an essential skill which can only be mastered by practice[21,22].

Dissertation and thesis writing plays a vital role in testing the independent research skills of the residents. Residents have faced difficulties in recruitment of new patients and follow up of previous cases for their proposed research work. In our study1033 (55.6%) of the residents accepted the fact that they are unable to devote time in thesis work due to increased workload of COVID related duties. Moreover, the immense work pressure and resulting mental stress has diminished their interest in carrying out additional research and academic activities.

Similar types of surveys were conducted amongst the trainees of various fields across the country and they felt that the COVID 19 lockdown has adversely affected their learning and training process[11]. This COVID-19 pandemic will have a long-term impact on the medical education and learning.Globally, there has been a transition of teaching procedures from face-to-face interactions to virtual meetings, which should be taken in a positive way both by the residents and faculties. An online survey conducted by Mishra D *et al*, Trainee Ophthalmologists across India revealed that 80.7% of the trainees felt that the COVID-19 lockdown had negatively impacted their Surgical Training; 54.8% perceived an increase stress during the COVID-19 lockdown and 75.7% opined that online classes and webinars were very useful at the time of lockdown[12]. Another survey among postgraduate orthopaedics Residents of Delhi, India revealed that about 94% of the Trainees felt that COVID-19 has affected their Surgical and Clinical Training, 71.6% had problems in completion of their thesis and 96% had concerns about their Mental Health[23]. A study by Odedra D, *et al*. among 460 Resident Members of the Canadian Association of Radiologists revealed that COVID-19 pandemic had a profound impact on various aspects of the Radiology Residency programs, which has been mitigated by various strategies such as virtual teaching rounds, virtual/phone readouts, video lectures and web tools for learning[24]. Another observational survey among the dermatology residents across India revealed a significant impact on their teaching and education programs[25]. In a recent review article, the authors assessed perceptions of the Junior Medical Staff and the impact of the current COVID-19 pandemic on their clinical education and training[26]. As there is increased demands on the Healthcare System due to the pandemic, residents and trainees belonging to one specialty have been redeployed to other specialties or have experienced reductions in their bedside and clinical exposure. This may lead to questionable

expertise on the subject of specialization, which may jeopardize the purpose of residency programs. Addressing potential remedies for the impact on training requirements, in four of these sources (50.0%), greater than 40% of respondents were amenable to an extension of training.

Limitations :

As the participants in our study were selected through snowball sampling, the representation of the selected sample may be compromised. But it was the most feasible way of sample selection throughout the country during COVID pandemic situation. Burden of duty and its effects on Academic curriculum are subjective entity. Adoption of a scored questionnaire would have been helpful to assess these subjective entities.

Conclusion

COVID-19 pandemic has severely compromised the Medical Postgraduate Academic Curriculum due to increased burden of COVID related duties, underutilization of Hospital services, barrier to academic activities and research. The pandemic has provided an opportunity to explore the learning methods applying modern emerging online digital technologies. The findings of our study highlight the major impact of the current pandemic on various aspects of the Postgraduate Residency Curriculum. Learning methods applying modern emerging online digital technologies will improve our teaching paradigms. The findings of our study would appropriately serve the National Regulatory Authorities to revise the existing curriculum and adopt accessible technology to meet the demands of the present times.

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Review Article

Lessons from the Pandemic and Healthcare Service Delivery for the Senior Citizens

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Background : The healthcare delivery system is an important indicator of the quality of life in a society. The advent of the Corona Virus pandemic led to an unfortunate and unforeseen disruption in the healthcare services Globally. The older persons were impacted on multiple counts including limitations in healthcare service availability, access and social marginalization.

As we gain more insight into the full impact of the Pandemic on the health quality indicators and look to resume Medical service delivery in Postpandemic times, it's important to ensure that the older population is not neglected.

Discussions : Small transitions in the delivery models but larger modifications in the mind-set may be needed to provide continued, effective and seamless healthcare services to the older Indian population. Planned interventions at each level of the system can ensure a smooth transition into the modified systems.

Integration of modern telecommunication technology into the medical practice and extensive research in the area can make telemedicine a more accessible and acceptable option to the elderly patients with chronic ailments. The full extent of the impact of the Pandemic on healthcare will be revealed in the coming times requiring constant adaptation of each element of the system to cope with it.

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Key words **: Senior citizen clinic, COVID-19, Interruption of care.**

Editor's Comment :

- The geriatric age group has been affected disproportionately by the COVID pandemic with various aspects of their life being hindered. Healthcare services for them became gradually more inaccessible as the lockdown was imposed and the senior citizen clinics came to an abrupt halt. With the possibility of subsequent waves of infection in the near future, modification of the health service delivery systems has become the need of the hour.
- This article tries to shed light on how with the strategic use of technology and multilevel health management practices, it's possible to restart the irreplaceable services provided by these clinics. Planned revamping of the healthcare system will allow us to move towards a new normal of geriatric care.

Every aspect of human life has been impacted like never before in the last one year ever since the arrival of the SARS-CoV-2 pandemic. Disruptions in healthcare service delivery have been noticed and reported across all disciplines and modalities. While some areas of healthcare delivery are struggling to get back to a new normal, elderly healthcare continues to remain suspended in most cities across the world, including India.

After surviving the first wave of the pandemic in 2020, India was hit by yet another devastating second wave in February 2021, experiencing unprecedented shortage of beds, oxygen and other medical supplies[1]. With the infection spreading in the Rural areas as well, the mutant viruses causing this wave proved to be much more infectious than the previous ones[2]. Even though the case fatality rate is lower, the surge of cases has crippled the already burdened healthcare system of the country.

Exhaustion of medical resources due to the large number of COVID-19 patients that led to the suspension of non-urgent services leading to an impact on the management of chronic non-communicable conditions especially in the older population. Recognition of the Geriatric Age Group as one of the major risk factors for COVID-19, the senior citizens were advised not to visit healthcare facilities unless very essential. Timely measures can help reverse and mitigate the acute and delayed adverse effects on Geriatric Health that happened consequently.

The current review summarizes the interruption and its impact on the lives of older persons and aims to assist make informed decisions around re-initiation of effective and efficient healthcare services to the elderly through the previously established Senior Citizen clinics with considerations towards the needs of the

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various stakeholders.

Healthcare for Older Persons – National Program for Healthcare of Elderly (NPHCE) :

The elderly population of any country requires specialised care in all aspects of life including health. The healthcare system of the country needs to be modified time and again as we better understand the specialised needs of the older people as Geriatric Medicine and the society in general evolves. To cater to the needs of the Geriatric Population of India, the Government launched the National Programme for the Healthcare of the Elderly (NPHCE) in the year 2010[3]. The programme ensures a holistic approach to providing healthcare to old people- ranging from Health Education to Tertiary Healthcare Services. Geriatric clinics and specialised Geriatric OPDs have been set up at Primary Health Centre, CHCs, District Hospitals and Regional Geriatric Centres of the country under the scheme. Other geriatric services like physiotherapy services, supportive devices, home care and home-based services are also provided. Training of public healthcare staff in geriatric care, development of specialised human resource by providing Geriatric Medicine MD in the Regional Geriatric Centres and promotion of Geriatric Research are also the focus areas of the scheme[4].

1.1. The Senior Citizen Clinic Scheme :

Weekly Geriatric Clinics at the Primary Health Centres, biweekly Geriatric Clinics at the Community Health Centre, dedicated Geriatric OPD services in the District Hospitals and the Regional Geriatric Centres had been set up following the guidelines outlined under NPHCE[2]. These clinics offer health assessment and laboratory investigations to the older people.

Routine medical check-ups of old people help monitoring the progression of the multiple co-morbid conditions, the multiple drugs taken by them and to screen for common conditions[5]. Screening helps in early detection of diseases and reduces the chances of developing complications and promotes healthy ageing. Regular visits also improve drug compliance. Senior citizen clinics have been instrumental in improving healthcare access for the Geriatric Population in many states. It's important to note that most of the Geriatric Population of India continues to attend the routine OPDs rather than these specialised states due to lack of awareness or accessibility.

Interruption of Healthcare Services for Elderly during the Pandemic :

Following the spread of the outbreak of Pneumonia from Wuhan to the entire World earlier this year, the Indian Government had initiated a Nationwide lockdown in late March to reduce the extent of spread. The unprecedented and unforeseen administrative action not only brought non-essential services to a standstill but also created an atmosphere of panic with rapid adoption of social distancing practices to avoid infection. Many hospitals experienced reduced outpatient visits and admissions into the non-COVID-19 wards[6].

Although, the lockdown was removed in phases, the fear among the older persons intensified with several National and International advisories following reports of increased susceptibility of elderly patients to the disease, from the Western Scientific Community. Preliminary research done in some countries suggests that that there's a significant decline in the health quality indicators like follow up, control and screening of diseases as well as vaccinations due to the reduced accessibility of primary healthcare for the people[7].

1.2. Impact on Senior citizens :

The elderly people have been a particularly vulnerable population in this scenario. COVID-19 has been proven to have a higher morbidity and mortality in the Geriatric population[8]. The disruption and the delay in resumption of medical services has inevitably led to secondary effects. Arguably, the greatest misfortune of this environment was the neglect of healthcare delivery for chronic non-communicable ailments which disproportionately affect the elderly. They waited patiently with remarkable tolerance not only for the services to resume but also for the pandemic to ebb before seeking healthcare.

The gap in the regular primary healthcare access due to the pandemic is expected to have long term effects on the epidemiology of non-communicable diseases[9]. Disruption in other services like senior activity centres, rehabilitation centres and dementia day-care centres has also worsened the prognosis of diseases in the elderly[10]. There is also an expected adverse effect on their mental health[11].

Resuming Healthcare Delivery :

Since the lockdown could not be continued indefinitely, Governments have started resuming services including healthcare services. Returning to the pre-COVID-19 standards may not feasible and a new normal may soon be found. Modifications in the health delivery system would be required for safe delivery of health care.

1.3. Guidelines and Advisories :

The WHO has suggested many measures to ensure safe delivery of healthcare for the elderly. The organisation proposes that the elderly be actively

involved in the process to ensure a sustainable model[12]:

(1) Health promotion:

a) Education about preventive measures and good hygiene practices

b) Promotion of safe and adequate physical activity at home

c) Education about when to seek help and how

d) Education regarding helplines for reporting abuse and/or mental health issues

(2) Care of older people with disabilities

a) Ensuring availability of information for those with impaired senses

b) Facilitating access to rehabilitation services including self-management information, assistive products and home exercise programmes

(3) Care of old people with chronic diseases

a) Reaching out proactively to old people and caregivers through tele medicine and community engagement

b) Ensuring availability of critical medicines with an effective delivery system

c) Regular monitoring and follow up of older people through tele health

(4) Care of care dependent old people

a) Identifying alternate caregiver and facility in case the primary is unavailable.

b) Offering psychosocial support and respite to caregivers

(5) When transitioning towards the restoration of services, the following are advised

a) Implementing outreach to high-risk groups and establishment of dedicated helplines

b) Assessing the changes in the treatment coverage and the utilization of social care services and rehabilitation services

c) Anticipating the backlog in suspended non-urgent healthcare services

Many organisations have also released Health Advisories for the elderly to better equip them to take care of themselves during the lockdown and to prevent infection. The International Association for Gerontology and Geriatrics Asia-Oceania (IAGG-AO) region has come up with a unique mnemonic making it easier for people to remember the health advice[13]:

C - Catnap (adequate sleep)

O - Optimistic emotion

V - Vigour (active exercise)

I - Intake of adequate nutritious food

D - Distancing

I - Increase online social contact

A - Administer routine medicines

G - Get enough sunlight

G - Go to emergency room/call emergency services in case of distressing symptoms

A - Active handwashing

O - Order groceries and medicines online or via caregiver/friends

At the start of the pandemic, the need for urgent measures to address the management of non-communicable diseases was realised. It was suggested that the patients be provided prescription refills for longer periods and doorstep medicine delivery mechanisms be set up in order to reduce the exposure to the virus in vulnerable groups[14]. Taking prompt action, the Government of India took many measures like releasing a health advisory and launching COVID-19 helpline number for senior citizens[15]. A guidance note was issued by the Government to enable deliver of essential services during the pandemic[16].

- This note identifies care of elderly as one of the non-COVID essential service.
- Regular delivery of 3 months' supply of medicines for non-communicable diseases with the help of Accredited Social Health Activists (ASHA) or at SHCs on prescription to be ensured
- States to ensure availability of dialysis and cancer treatment for patients including transport facilities.
- Auxiliary Nurse Midwifes (ANM) or Community Health Officers (CHO) to visit households of elderly bimonthly to check for complications and treatment adherence. ASHAs to be connected via telephone to the elderly and their families.

Although several guidelines are available but there is considerable scope for improving awareness and compliance.

1.4. The Era of Telemedicine- The Virtual Geriatric Clinic :

The inability to physically connect with a physician has invariably led to the virtual connection becoming more important. The COVID-19 pandemic heralds the era of telemedicine. There has been a mass shift from in-person visits to tele-consultation in the initial months of the pandemic[17]. Recognising the need for training the practicing physicians to use the virtual platforms effectively, many guidelines were issued and trainings conducted.

One of the new concepts have been the Virtual geriatric clinics. A systematic review of available literature showed that the virtual clinic practices have been largely satisfactory for the patients and the physician by providing effective polypharmacy review, reducing complications, reducing the waiting time for consultation and being cost effective[18]. There have been promising development of Telehealth Geriatric Assessment models but more research and trials are

needed in this area[19].

Extensive research is being done to understand the challenges and the feasibility of using telemedicine. The older population can find it difficult to access telehealth services because of many factors like lack of knowledge and understanding of the system, reluctance to use new technology due to trust and privacy issues and lack of electronic appliances or internet access[20]. Lack of internet access and the high rates of illiteracy among the older people are the major challenges in India. Addressing these issues along with training and appropriate counselling of the older people can go a long way in increasing acceptance of telemedicine and this can prove to be an efficient way to provide outpatient consultation, regular health check-ups and follow-ups. Use of telephone for consultation can be used in a resource restricted environment like India.

Future and Planning — Lessons from Other Nations and the Role of NGOs :

The greatest challenge for India would be to remodel, reanalyse and revamp the existing healthcare system to overcome the burden of the increasing COVID-19 cases and the backlog of the *non-urgent* procedures and services that had been suspended.

The challenges faced and the innovative approaches adopted by other Nations can serve as lessons for us. Asian Countries like China, Hong Kong and Singapore were prompt in taking measures to ensure Geriatric care such as launching of official app for specialist guidance, fully online rehabilitation and nursing sessions, webinars for training of families in first aid and care of elderly and production and distribution of free printed and virtual health promotion material in English and native languages, use of radio and television for health promotion and postal drug refills[10]. Many of these measures are suitable and can be adapted to fit the Indian scenario.

In India, NGOs like HelpAge India have been doing their bit by giving health advisories to elder people via phone, launching free elderly helplines, mobile units and health teams, delivering medicines and protective hygiene kits and providing transportation to the hospitals[21].

Towards a New Normal :

The pandemic has forced the healthcare system to modify itself within a short span of time. Consequently, the various stakeholders of the system have had to and will have to keep pace with the latest developments. Navigating through the vast information explosion about COVID-19 that has happened during the past months can be a difficult task. Through this article, the authors aim to crystalise the roles and expectations from the different stakeholders and provide implementation strategies to aid provision of effective and efficient services to the elderly.

1.5. The Stakeholders- Concerns and Expectations :

As we look to formulate the plan to restart our healthcare services, it's helpful to take a look at the expectations we have from all the elements of the system and major concerns for them that need to be addressed (Tables 1&2).

Table 1 — *Concerns and expectations for the various stakeholders*

Stakeholder	Expectations from the system	Concerns
Healthcare seekers	• Free medicines • Timely prescription refill • Regular follow up and consultation	• Risk of infection with COVID-19 • Difficulty in getting transportation • Difficulty in accepting telemedicine services
Healthcare provider	• Adequate supply of personal protective equipment • Help in setting up telemedicine services in clinics/hospitals with training • Support from the paramedical and social workers to deliver services • Funding to carry out research	• Risk of infection with COVID-19 • Increased working hours and exhaustion
Hospital/Clinic Administrator	• Adequate financial support from the policy makers to revamp the services. • Uninterrupted supplies of all logistics from various agencies.	• Limited funds • Being able to reduce complaints and increase satisfaction with minimal changes in the existing system
Policy Maker	• Adequate support from the other stakeholders to form the best policies. • Proper implementation of the policies • Receptiveness and a feel-good factor among the communities	• Pressure from various groups to initiate services early. • Limited resources for allocation into parallel areas

Table 2 — *Measures to take at various levels while resuming healthcare services for the elderly.*

Level of care	Measures to be taken
Personal*	• Keep information about local and online emergency and elective services. • Keep updated information about Govt. and NGO schemes, support available. • Rely on verified sources for health information and follow appropriate guidelines. • Use telemedicine services for follow up or new complaints to minimise inpatient visits. • Learn about common symptoms and complications of diseases, seek medical attention when something is not right
Doctors	• Use video call and telephone services for follow ups and general health assessments with adequate grievance redressal mechanisms for patients. • Use upcoming telehealth assessment models for the geriatric patients[19] • Pre-schedule inpatient visits to prevent waiting room rush. • Regular trainings through webinar/ other if permissible
Paramedical staff**	• Schedule regular home visits for general assessments and delivering drugs and other supplies. • Maintain constant contact with old people via telephone or other online services. • Conduct online rehabilitation and health promotional sessions for patients and care takers. • Train patients to use telemedicine platforms with adequate grievance addressal
Health Administration	• Conduct training of staff to use new technology. • Using apps and software for managing patient visits, monitoring patient health, conducting teleconsultations and maintaining doctor patient interaction • Distribute tokens with numbers at windows or use automated kiosks. • Ensure adherence to the use of face masks and social distancing protocols within the premises. • Ensure uninterrupted supply of personal protection equipment & other logistics. • Advertise policies widely using platforms that cater to the target user base in the catchment area of the hospital. • Develop a robust grievance redressal mechanism. • Wide publicity of helpline numbers and health messages/ instructions on social media and other mass media. • Longer prescription refills and doorstep delivery of medicines for non-communicable diseases
Policy Makers	• Provide medical and financial relief to the older population. • Invest in creating apps and software that can be used for free for telemedicine. • Develop and circulate (online and printed) health promotional material in native languages. • Advertise policy decisions and changes to the user base in a timely manner to reduce chaos. • Provide incentives to conduct geriatric medical research. • Creating more seats in MD Geriatrics for human resource development

**Individual and caretaker- Assistance of the caretaker is important for navigating new technology. **nurses, physiotherapists*
Info. = Information, Govt. = Government, NGO=Non-Government Organisation

1.6. Resuming the Senior Citizen Clinic :

The following table summarises the existing services provided and the suggested modifications in the Geriatric Clinics operating at different levels of the healthcare system (Table 3).

1.7 COVID Vaccination Drive :

The Central Drugs Standard Control Organisation (CDSCO) in India has granted an emergency use authorisation to two vaccines against COVID - Covishield® and Covaxin®. The Government of India started a phased vaccination drive with the higher risk groups being vaccinated on priority[22].

As the geriatric population is among the first ones being vaccinated to reduce the mortality associated with the disease, the senior citizen clinics can serve as vaccination centres. Additional Information Education Communication (IEC) sessions can be held at the clinics to address any concerns and misconception about the vaccine.

Conclusion

During the last one year, healthcare communication has transformed to allow younger individuals to adopt modern solutions but older people who form the largest user base of healthcare services, have been disproportionately challenged. They have been affected not only by a limitation of service but also hindered by restrictions in access and social marginalization. The full impact of the multiple whammies may become evident only in the coming months when we are likely to see continued smaller surges in cases as the virus adapts and transforms.

With the ongoing Second Wave and the possibility of subsequent waves in the near future, we can't expect the pre-covid healthcare infrastructure to work without the appropriate modifications. A phased resumption of healthcare services along with novel unprecedented infrastructure redevelopment of the existing models by

Table 3 — *Services provided and modifications at different levels (Government)*

Health Facility	Existing Services+	Suggested Modifications
Primary Health Centre	• OPD Services • Home visits • Simple lab investigations • Supportive devices given. • Health education and promotion	• Ensuring strict adherence to face mask use and social distancing by the patient and the caregiver both. • Rapid antigen testing before physical consults for high suspicion patients. • Health educators and assistants to help patients become familiar with telemedicine. • Webinars to make patients comfortable with new technology. • Booking appointments over phone (both online and offline) and initiating helplines • Develop teams for home visits. • Omit mandatory visit to the doctor for patients who merely need prescription refills. • Early vaccination for patients and healthcare workers • Teleconsultation facility (one screen and internet connection)
Community Health Centre	• OPD Services • Physiotherapy • Home visits • Rehabilitation services • Supportive devices given	• Ensuring strict adherence to face mask use and social distancing by the patient and the caregiver both. • Rapid antigen testing before physical consults for high suspicion patients. • Encourage Home visits • Limit the need for doctor to consult merely for prescription refills. • Rehabilitation services can be shifted online. • Early vaccination for patients and healthcare workers • Teleconsultation facility (one screen and internet connection)
District Hospitals	• OPD Services • Physiotherapy • Indoor admissions • Supportive devices given	• Ensuring strict adherence to face mask use and social distancing by the patient and the caregiver both. • Rapid antigen testing before physical consults for high suspicion patients. • Online booking of appointments for consultations • Facilities for segregation of contagious patients • Robust biomedical waste management • Early vaccination for patients and healthcare workers • Teleconsultation facility (one screen and internet connection)
Regional Geriatric Centres	• OPD Services • Physiotherapy • Indoor admissions • Supportive devices given. • Lab investigations	• Ensuring strict adherence to face mask use and social distancing by the patient and the caregiver both. • Rapid antigen testing before physical consults for high suspicion patients. • Online booking of appointments for consultations • Facilities for segregation of contagious patients • Early vaccination for patients and healthcare workers • Teleconsultation facility (one screen and internet connection)

+ According to the National Programme for Healthcare of Elderly (NPHCE)[4]

incorporating new innovative ideas using out-of-the-box thinking could ensure effective delivery to the older adults. New models would be needed to maintain social distancing while ensuring adequate delivery despite an increased demand from an already rapidly growing segment of the population.

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— Hony Editor

Review Article

COVID-19 Second Wave and Doctors Death

Kaushik Bhattacharya[1], Neela Bhattacharya[2]

The Second wave of Coronavirus Disease 2019 (COVID-19) pandemic has brought about unprecedented mortality amongst the Medical Fraternity. According to the Indian Medical Association, 420 doctors have died during the Second Wave of COVID-19 and the reason is mostly due to late presentation, lack of hospital beds with ventilatory support, crisis in the regular oxygen supply along with deficiency in the availability of few antibiotics and lifesaving medicines. The main point to consider retrospectively now is where few deaths of the doctors preventable and what went wrong in the management during the Second wave of COVID-19. [*J Indian Med Assoc* 2022; **120(1):** 39-40]

Key words **: COVID-19, Pandemic, Vaccination, Ventilator.**

"By medicines, Life may be prolonged, yet death will seize the doctor too"

— William Shakesphere

When Indian Medical Association (IMA) registry declared that Second Wave of COVID-19 has caused death of about 420 doctors in the country and approximately on an average 20 doctors dying per day due to the Virus with Delhi and Bihar leading from the front having lost more than 100 doctors each, it was an eye opener for the entire Medical Community as to what went wrong in the management of the crisis and could the catastrophe be avoided or managed in a better way by saving few precious lives of the Medical fraternity[1]. During the First Wave in 2020, India had lost 748 doctors. With the updated toll shared by the IMA, India has now lost more than 1,100 doctors due to COVID-19. The fact that IMA has a registry of deaths only about its registered members, India does have a lot of doctors who are not registered under the banner of IMA and so the death toll may be extremely high than the official statistics.

Reason for Death of Doctors during Second Wave :

No clear data or any official death audit being available, the speculation is that there were multiple reasons for this calamity like non availability of hospital beds during the critical period, non-availability of ventilatory support or BiPaP support in the Intensive Care Unit due to increase load of patients, stoppage or unavailability of oxygen support due to the lack of oxygen cylinders, deficiency of life saving medicines due to soaring caseload, vaccine hesitancy or not getting vaccinated and a gross mismatch between the doctor patient ratio might have been the reasons for such a high incidence of doctors death during the Second Wave.

Editor's Comment :

- Doctors were the primary caregivers during the COVID-19 pandemic but also faced the brunt of the attack due to this virus and suffered significant mortality. With the country not adequately prepared well to face the challenge of Corona virus, there were lacunae in every front with lack of Personal Protective Equipment, drugs, oxygen, ventilators and hospital beds and it was the medical community alone who went to the war against that virus without sufficient arms and ammunition. Its time for the doctors to rethink their strategy and modus operandi in future while dealing with the third wave of COVID-19.

With the Government of India telling the Supreme Court that doctors are responsible for their own safety while dealing with COVID-19 cases while implementing the new Standard Operating Procedure for front line COVID-19 healthcare workers, by which it has ended the 14-day Mandatory quarantine for them, now the onus is on the medical doctors to treat the COVID patients without getting infected[2].

According to the IMA, only 66% of the doctors have been vaccinated so far and the number of doctors who succumbed to COVID-19 even after two doses of vaccine was only 3%. None of the vaccinated doctors suffered from serious COVID disease process. Thus, the positive effect of vaccination was felt throughout the country in the Medical Community.The US Centers for Disease Control and Prevention has identified a small cohort of approximately 5,800 cases of COVID-19 infection among more than 66 million Americans who have completed a full course of vaccination[3].

Unusual Death of Doctors in Second Wave :

Among the most tragic death, the Head of the Department of Gastroenterology, Batra Hospital, New Delhi succumbed due to oxygen scarcity during the Second wave. Another death which caused grief, fear and anger in the country was the suicide by a Resident Doctor of Max Hospital, Saket due to pandemic fatigue working nonstop in the ICU.

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In 37 doctors have died in West Bengal during the Second wave and out of them only three doctors aged below 50 years have died and none of them were vaccinated. In West Bengal, most of the deaths occurred in doctors above 60 years having associated co-morbidities.

Delay in RTPCR Report :

Two doctors from Kalyan, both father and son, died due to delay in getting Reverse Transcription Polymerase Chain Reaction (RT PCR) report and thereby the patient got serious and died. Without a report of COVID positive, both the doctors could not secure a bed for admission in the hospital, turned critical and succumbed to the disease. Due to sudden spike, the report of RT PCR usually is available after 4 to 5 days as there were on an average 5000 tests being conducted each day[4].

Vulnerable Speciality Doctors :

Data from the IMA suggests General Practitioners, Primary Care Physicians and Emergency Doctors dealing acute or active COVID-19 cases seem to be disproportionately affected[5]. During the First Wave, most of the deceased, 225(58.9%), were General Practitioners. Among the specialists, the maximum mortality was found in Paediatricians 26(6.8%), Medical Specialists 24(6.3%), general surgeons 22(5.8%), Obstetricians & Gynaecologists 16(4.2%) and Anaesthesiologists 14(3.7%)[6]. A distinguished New Jersey fully vaccinated professor at Rutgers New Jersey Medical School and who was a founding member of the New Jersey Infectious Disease Society, considered as "Giant in the Field of Infectious diseases" died in the Second Wave after coming to India from US, making many medical professional wonder what is going wrong in diagnosis and management of this disease?

Can Doctors Death be Prevented?

According to the doctors working at Nalanda Medial College and Hospital, Patna, no quarantine period is being given to the doctors on Covid duty after working continuously in the Covid Ward[7]. Poor doctor patient ratio and lack of quality Personal Protective Equipment are another concern. With the report of aerosol travelling in the air for 10 m, its especially important for the Medical Community to go for double masking or strictly wearing only a good quality N95 mask. There have been reports of doctors in US not wearing the mask properly and there are no legal implications of doctors not wearing mask on duty[8].

CT-Scan chest should be used as the primary screening tool for COVID-19 along with RT PCR as Computed Tomography (CT) scan finding was found to be reliable, practical, and rapid and were able to detect early changes occurring in the lung when the pulse oximeter was showing almost normal oxygen saturation[9].

Doctor fatigue both mentally and physically need to be recognised and measures are to be taken to recruit medical and para medical staff from Private Medical colleges and private hospitals, to decrease the workload of these frontline doctors. Doctors themselves must recognise the risk and take better care to improve their general health and immunity. Being complacent and overconfident can end up being fatal.

Doctors should be made VIP patients by all concerned Governments and Health Ministries. Separate beds need to be allocated for them with sufficient infrastructure so that pathetic deaths due to lack or stoppage of Oxygen does not occur.

All the doctors should get vaccinated without fail. Dr Vageesh Jain from University College London quotes "As it stands, legally, you don't have to have a COVID vaccine. But ethically, clinically, epidemiologically—whichever way you slice it—I would argue you do"[10].

Conclusion :

Doctors, dressed up in one professional costume or another, have been in busy practice since the earliest records of every culture on Earth. It is hard to think of a more dependable or enduring occupation, harder still to imagine any future events leading to its extinction.

— Lewis Thomas

But then this Corona virus pandemic is doing just that, and the human race cannot afford to lose hands and minds that heal. It is an urgent requirement that the danger faced by the doctors is recognised and effective steps implemented to prevent it on a war footing.

Conflict of Interest : Nil

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Case Report

Cardiac Tamponade an Unusual Presentation of SLE — A Case Report

Abhijit Girish Borse[1], Sagarjyoti Roy[1], Arunava Mitra[2], Tirthankar Roy[1], Kanak Kumar Mitra[3]

Systemic Lupus Erythematous (SLE) is an immune mediated disease, having variety of clinical manifestations but Cardiac Tamponade is rare as initial presentation. We are presenting an unusual case of cardiac tamponade as initial manifestation of SLE, which was also associated with Mitral Valve Vegetation, Posterior Reversible Encephalopathy Syndrome (PRESS); successfully responded to Pericardiocentesis, Steroids and Antimalarials.

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***Key words* : Systemic Lupus Erythematous (SLE), Cardiac Tamponade Nonbacterial Thrombotic Endocarditis, Posterior Reversible Encephalopathy Syndrome.**

Systemic Lupus Erythematous is an autoimmune disease, presents with broad range of clinical manifestations involving multiple organ systems. Pericarditis, Myocarditis, Endocarditis and conduction system abnormality may be observed in more than 50% of patients,[1] but Cardiac Tamponade being very rare as first manifestation[1]. We are reporting a case of SLE presenting with cardiac tamponade along with non bacterial thrombotic endocarditis, Severe Mitral regurgitation, Neurocognitive Symptoms (PRESS). Patient successfully treated with pericardiocentesis, steroids and antimalarials.

Case Report

21-Year-female, without any previous illness, presented in Emergency Department with severe shortness of breath developing over period of 3 days, associated with bilateral pedal oedema & chest pain. Patient had history of recurrent spontaneous abortion & the last being 3 months ago. On admission patient's BP: 90/60mm/hg, PR: 130/min, SPO2: 94%, RR: 32.TEMP:38.1 F General Examination: Pallor present, pitting oedema, Jugular Venous Pressure (JVP) raised with prominent a wave, S1 S2 muffled but a faint apical systolic murmur present. No palpable organomegaly. Patient was conscious oriented, had no focal neurological deficits. ECG showed sinus tachycardia with low voltage complexes, chest X-Ray showed enlarged Cardiac Silhouette with mild bilateral pleural effusion. Echocardiography on admission revealed massive pericardial effusion 30 mm posteriorly, with features of Cardiac Tamponade. (Right atrium collapse and Right ventricle diastolic collapse, dilated non collapsible IVC, exaggerated respiratory inflow variations across mitral and Tricuspid valve) with Mitral regurgitation (Fig 1).

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Editor's Comment :

- SLE may rarely present with Cardiac tamponade as an initial manifestation. High degree of clinical suspicion with proper evaluation of history, physical findings and investigations will help in early diagnosis.
- Cardiac tamponade in SLE can be effectively managed with pericardiocentesis along with high dose steroids and other immunosupressant's.
- Early institution of pharmacotherapy induces remission and prevents recurrence.

Patient undergone Pericardiocentesis and 1 litre of haemorrhagic fluid were withdrawn. Immediately there was hemodynamic improvement with relief of respiratory distress and improvement of blood pressure to 100/70. After stabilisation, the Systolic Murmur became more prominent and Echocardiography on 3 rd day revealed regression of pericardial effusion and severe MR and a prominent 6×5 mm single vegetation on ventricular aspect of Anterior Mitral Leaflet seen, with preserved left Ventricular Systolic Function (EF=60%)(Fig 2).

Initial blood routine showed Hb:7.7 gm/dl, with Normocytic Normochromic Anaemia, thrombocytopenia with platelet:68000/mm^3,tlc :4300, Serum creatinine: 0.9 mg/dl, e-GFR :110, Urine protein :3+, CRP: 1.9mg/dl, Viral markers: (HBsAg, Anti HCV,HIV) Non-Reactive, INR : 1.15, D-Dimer:2.07microgm/dl. During hospital stay on day 6th patient developed headaches and Generalised Tonic Clonic Seizures (GTCS) with Accelerated Hypertension of 190/110mm/hg. Patient was stabilised with Lorazepam, Phenytoin and Labetalol. Anaemia, Thrombocytopenia, Proteinuria, MR with MV Vegetation, GTCS In a case of tamponade 'All suggestive of underlying SLE'.

ANA : Positive. **Anti-dsDNA :** Negative

ANA Profile :

MRI BRAIN: Showed multiple focal discrete altered signal intensity lesion hyper intense on T2, Fluid-Attenuated Inversion Recovery (FLAIR) & iso to hypo on T1 without any changes in Diffusion Weighted Images (DWI) at both fronto-Parietal-occipital region. Suggestive of

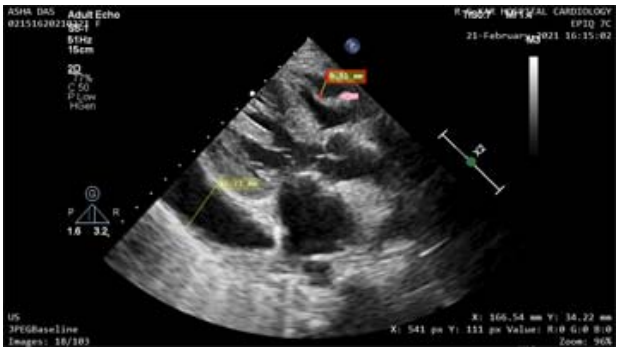

Fig 1 — Parasternal long axis view showing large pericardial effusion 30 mm posteriorly & 10 mm anteriorly with RV diastolic collapse. (Arrow) suggestive of Tamponade.

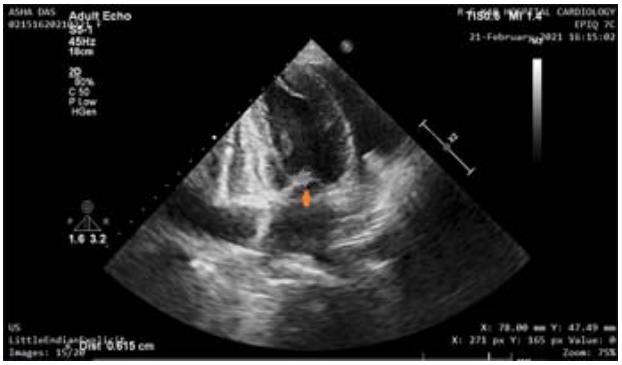

Fig 2 — Apical two chamber view showing vegetation at ventricular aspect of anterior mitral leaflet (AML) (Arrow)

- Reversible-encephalopathy syndrome.
- Secondary demyelination.

Pericardial fluid analysis showed TLC 3200 mm^3, 110 RBC /mm^3. ADA: normal, culture showed no growth, cytological evaluation showed no malignant cells.

So the diagnosis made as **CARDIAC TAMPONADE WITH MITRAL VALVE VEGETATION (LIEBMANS SACK ENDOCARDITIS) & REGURGITATION COMPLICATED WITH POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME (PRESS) IN CASE OF SLE.**

Treatment started with Pulse steroid therapy with Intravenous Methylprednisolone 1 gm/day for 3 days followed by oral Prednisolone 40 mg once a day along with Hydroxychloroquin, ARB (Losartan) for Proteinuria and hypertension, Diuretics & PRBC Transfusion. Pre-discharge Echo showed significant regression of pericardial effusion and diminution of mitral valve Vegetation, patient was discharged in stable condition and advised follow up.

Discussion

SLE is an autoimmune disease affecting predominantly females, where Cardiac involvement observed in more than 50% of patients[1]. In the form of Pericarditis, Myocarditis, Valvular involvement, Thrombosis and Conduction disorder[2]. Though Pericarditis being most common, affecting almost 25% of the patients[3] but Cardiac Tamponade is seldom an initial presentation. A large study showed less than 1% of involving with Tamponade out of 1300 patients[4]. Our patient presented unusually with Dyspnoea, Swelling over body, Chest pain initial diagnosis made on basis of clinical findings, ECG and Echocardiography finding as Cardiac tamponade. Patient was found to be Anaemic and Thrombocytopenic & unmasking of hypertension detected after Pericardiocentesis. During hospital stay patient developed Neurocognitive symptoms with seizures. Our patient fulfilled 2019 European league against rheumatism/ American college of rheumatism (EULAR/ACR) criteria for SLE (highly positive ANA with 29 points) & 2012 Systemic Lupus Collaborating Clinics (SLICC) criteria for SLE 6 out of 17 including clinical and seroimmunoassay. (Table 1)[5] Patients MRI brain imaging was suggestive of Reversible Encephalopathy Syndrome. Patient's symptoms were not attributable to infections, medication, hypothyroidism and malignancy hence final diagnosis of SLE confirmed. Patient responded dramatically to percardiocentesis, high dose steroids & antimalarials.

Table 1 — *Sero-immunoassay*

Antigen	Intensity	Class
RNP/sm(RNP/sm)	86	+++
Sm(Sm)	90	+++
Ro-52 recombinant(52)	57	+++
PCNA(PCNA)	37	++
Histones(Hi)	39	++
Ribosomal -P-protein(RIB)	42	++

Conclusion

Cardiac Tamponade may be a rare initial presentation of SLE. Emergency Pericardiocentesis is life saving and provides time for further evaluation and management. High degree of clinical suspicion is required to detect other subtle systemic features for underlying aetiology. Early immuno-assay in a clinically suspected case of SLE like Anaemia Thrombocytopenia, Pleuro-pericardial effusion, MR and Mitral Valve Vegetation's, PRESS etc. are rewarding for initiation of effective treatment and remission.

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Case Report

Jejunal GIST — An Obscure Cause of Melaena

Rishav Sanghai[1], Rishav Mukherjee[2]

Gastrointestinal Stromal Tumours (GISTs) are one of the rare causes of Alimentary Tract Neoplasm. They arise from the Interstitial Cells of Cajal (ICC) with overexpression of proto-oncogenes like KIT, PDGFRA and BRAF-Kinase, etc[1]. The typical location of these tumors is the stomach with Jejunal GIST being the rarest variant. The maximal incidence of the disease is reported in the sixth decade of life. GISTs are often asymptomatic and clinicians are misdirected towards a different diagnosis because of its variable nature of presentation. The clinical feature typically ranges from non-specific abdominal symptoms like nausea, vomiting, bloating, etc, to abdominal emergencies like hemorrhage, anemia, or obstruction. Although mostly benign, there is a high probability of progression to malignancy[2]. Thus, in patients with no appreciable cause of gastrointestinal bleed or chronic abdominal discomfort, GIST should have high suspicion index. This can help to limit the progression and thereby prevent further complications. Due to its location, it is difficult to identify by Endoscopy or Colonoscopy. Single Balloon Enteroscopy (SBE) and CT Scan of Abdomen are the primary investigational modalities. The treatment aims at resection of the mass with continued Postsurgical surveillance and targeted molecular therapy in some cases.

Herein, we report a 14-year-old boy with chronic paleness and gradual onset repeat episodes of Melaena. Despite repeated blood transfusions, the patient had a Hemoglobin <7g/dl. All his initial investigations, including Endoscopy and Colonoscopy, were normal. CT abdomen raised suspicion of a small mass (3-4cm) in the proximal small intestine and was confirmed by Single Balloon Enteroscopy. The lesion was tattooed during the procedure and subsequently, resection was carried out with wide margins. Due to its small size and low mitotic rate on HPE (<5-50/hpf), imatinib was not indicated and only continued postsurgical surveillance is advised for a period of 3 years.

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Key words **: Gastrointestinal stromal tumor, Melaena, Diagnosis, Management.**

Gastrointestinal Stromal Tumour (GIST) is one of the scattered mesenchymal Tumour of the Gastrointestinal Tract (GIT). It accounts for only 0.2% of all GI Tumours. The most common location is the stomach and small intestine accounts for only 20% of the GIST. Among the small intestinal variant, Jejunal is the rarest subtype. The majority cases of the disease occur at 50-70 years of age.

Mazur and Clark first introduced GIST in 1983. They arise from the Interstitial Cells of Cajal (ICC), which are known to be the pacemaker cells of the small intestine. [3]The growth of the Tumours is primarily driven by the over-expression of proto-oncogenes C-KIT, Platelet-Derived Growth Factor (PDGF)-alpha polypeptide or BRAF kinase. These proto-oncogenes drive the activity of Tyrosine Kinase Receptors at ICC, thereby facilitating growth.

They present with vague symptoms that can be easily missed or ignored in the initial setting. Some individuals present with nausea, vomiting, and vague abdominal pain. In later stages or if the mass >5 cm repeated bouts of Melaena develops. Some patients also present with worsening Anemia (not responding to blood transfusion) and loss of appetite. In some instance, there can be a palpable mass that needs immediate intervention.

Editor's Comment :

- Jejunal GIST is a very easily missed diagnosis for Melaena that shall be kept into consideration. The reason being the atypical nature of presentation and difficulty in visualisation by rationale investigation techniques. Hence, attention should be paid while listing the differentials for a sudden onset Melaena without an otherwise evident condition.

The initial management should be to visualise the mass using imaging studies. The definitive line of diagnosis is postsurgical biopsy and immuno-histochemistry.

There is a 50% chance of recurrence in patients bearing the primary tumour[4]. Therefore, proper follow-up is required after surgery. Follow-up can be done using serial CT-Abdomen and Pelvis or Ultrasonography (preferred in young individuals) every three to six months. The uncovering of newer generation biologics like imatinib and sunitinib are effective against metastatic and unresectable variants.

So, we present over here an unusual case of Jejunal GIST in a 14-year-old boy.

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Case Report

A 14-year-old boy presented to the Emergency Department with worsening pale complexion and tarry black stool for two weeks. He had one episode of dizziness that resolved spontaneously a few days before presentation. There was no associated abdominal pain or other symptoms.

Clinical examination revealed pallor, tachycardia and decreased breath sounds on the Left Lung Base. Mild grade bilateral pedal edema was also seen on examination, no Lymphadenopathy was noted. Abdomen was soft and no palpable mass was evident on examination. The Liver and spleen were not enlarged. Initial investigational reports showed Haemoglobin of 7.2g/dl. Despite repeated PRBC (Packed Red Blood Cells) transfusion, the patient was unable to keep up a Haemoglobin of >7g/dl.

Initial investigational report with Abdominal Ultrasonography, Upper Gastrointestinal Endoscopy and Colonoscopy revealed no significant finding. CECT Abdomen reported a suspicious mass in the jejunum (Fig 1).

Fig 1 — CECT Abdomen showing a suspicious mass (as indicated by arrow)

This was followed by Single Balloon Enteroscopy, which visualised a 4-5cm sub-mucosal mass with central ulceration (Fig 2). The mass was inked and tattooed to aid identification during surgery.

Elective Exploratory Laparotomy was chosen as the line of management. It revealed an approximately 4cm tattooed extramural tumour at the proximal Jejunum, 25cm distal to the duodenojejunal flexure. There was no infiltration into nearby structures or any evidence of metastasis or Lymphadenopathy. The tumour along with adjacent lymph nodes was excised by resection of the Jejunum with wide mesentery and the gastrointestinal continuity was maintained by interrupted anastomosis.

Histopathological examination of the Tumour revealed a 3x2.2x2 cm sized mass protruding into the Jejunal lumen. It was composed of spindle-shaped cells arranged in fascicles and intersecting bundles. Mitotic figures were very sparse being <5/50 hpf. The lymph nodes did not show any Tumour deposits. Immunohistochemistry was positive for CD117, CD34, and desmin. These findings were consistent with benign Gastrointestinal Stromal Tumour (GIST). Staging was reported as T2N0M0. The risk stratification concerning the mitotic rate, size and location unveil a 4.3% chance of disease progression, which falls into low-risk category.

The patient was stable on discharge. He has been on follow-up for 24 months Postoperatively. Serial USG and Contrast-enhanced Computed Tomography (CECT) Abdomen were normal except for an incidental occurrence of Calculous Cholecystitis that was managed with Laparoscopic Cholecystectomy.

Discussion

GIST is one of the areas that is not explored in depth due to its low incidence and non-specific presentation. It is generally absent in the initial list of differentials in a patient presenting with Melaena. Thus, clinical diagnosis is based on the index of suspicion. Some intra-abdominal tumours can mimic GIST. Some of them are abdominal Leiomyoma, Leiomyosarcoma, Inflammatory Fibroid Polyp, Abdominal desmoid etc[5]. They are differentiated mainly based on histopathological examination.

As discussed about its variability in presentation, the diagnosis remains a challenge. Visualisation of the mass is the key to diagnosis. Although abdominal ultrasonogram is used as the initial investigation the Tumour can be easily missed due to its size, location, and the organ of origin. Therefore, CT abdomen is used to identify the lesion in its initial level of presentation. It tells us about the location, size, or calcification (if present). The degree of calcification also gives us a clue regarding the associated Necrosis, which may be a sign of malignancy.

Apart from indirect visualisation (as discussed), direct visualisation procedures are also used in identification. Upper GI Endoscopy, Colonoscopy and Single Balloon Enteroscopy are some examples. They can aid biopsy of

Fig 2 — Mass as visualised in SBE

Table 1 — *Risk of progression to GIST to malignant stage depending on its size and mitotic rate*

Tumour Parameters			Percentage of patients with progressive disease during long term follow-up			
Group	Tumour Size	Mitotic Rate	Gastric GISTs	Jejunal &Ileal GIST	Duodenal GIST	Rectal GIST
1	≤2cm	≤5-/-50-HPFs	0% none	0% none	0% none	0% none
2	>2cm ≤5cm	≤5-/-50-HPFs	1.9%very low	4.3%low	8.3%low	8.5%low
3a	>5cm ≤10cm	≤5-/-50-HPFs	3.6% low	24%moderate	34% high ‡	57% high ‡
3b	>10cm	≤5-/-50-HPFs	12%moderate	52%high	34% high ‡	57% high ‡
4	≤2cm	>5 / 50 HPFs	0% †	50% †	§	54%high
5	>2cm ≤5cm	>5 / 50 HPFs	16%moderate	73%high	50%high	52%high
6a	>5cm ≤10cm	>5 / 50 HPFs	55%high	85%high	86%high	71%high ‡
6b	>10cm	>5 / 50 HPFs	86%high	90%high	86%high	71%high ‡

the lesion or inking the site for identification during surgery. Recent advances like Capsule Endoscopy, Narrow-Band Imaging (NBI) are also important cornerstones for outlining the Tumour.

The curative intent for the disease treatment is surgical excision of the tumour with a clear narrow margin. The prognosis is dependent upon the size of the Tumour and its mitotic activity. If the size is >5 cm and mitotic activity is >5-50/hpf, there are chances of malignant potential. Miettinen and Lasota in 2006 have developed the risk table on follow- up information of thousands of patient having GIST over time[6]. The Table is hereby shared at the end of the discussion (Table 1).

With the advent of newer generation biologic drugs like imatinib, it is used as a neoadjuvant to achieve cytoreduction in cases where clear surgical excision cannot be made. This drug along with newly discovered sunitinib is used for several years with encouraging results as adjuvant and neoadjuvant therapy[7]. Thus, they have proved as successful molecular therapy for the management of recurrent or unresectable GIST.

Conclusion

GIST can easily evade detection. The pre-operative diagnosis is often missed due to its non-specific presentation and lower incidence. Thus, it should have high suspicion index in patients with no apparent cause of Melaena or unexplained cause of abdominal discomfort. Hence, an increased degree of awareness of GIST is of paramount significance to manage this rare but aggressive tumour. A multi-disciplinary approach with direct and indirect imaging, surgery, continued surveillance and targeted Molecular Therapy is the mainstay of management for successful outcomes.

Conflict of Interest and Funding : There is no conflict of interest between the authors and there was no source of funding for this case report.

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Case Report

Corynebacterium falsenii Bacteremia Occurring in a Term Neonate Causing Late Onset Neonatal Sepsis

Maitreyi Bandyopadhyay[1], Tannishtha Roy[2]

Isolated from blood and Cerebrospinal Fluid (CSF) cultures of Leukemia and Lymphoma patients, *Corynebacterium falsenii* was first identified in 1998 as a new *Corynebacterium* species. In 2010, it was reported as a cause of Bacteremia in a 13-month-old infant on Vancomycin therapy. We are hereby describing a *Corynebacterium falsenii* bacteremia occurring in a 15-day-old term neonate causing late onset Sepsis.

[*J Indian Med Assoc* 2022; **120(1):** 46-7]

Key words **: Corynebacterium falsenii, Late onset neonatal sepsis.**

Case Report

A 25-year-old second gravida who had received two doses of Antenatal Tetanus Vaccine, with an uneventful previous birth history, presented with obstructed labor at 39 weeks of gestation at R.G. Kar Medical College and Hospital, Kolkata. A baby boy was delivered by Emergency Caesarean Section. The mother had received Injection Ceftriaxone before Caesarean Section.

The baby was of 2.1 kg body weight at birth, cried at birth, no cyanosis, pallor, icterus at birth. Baby received Day 0 doses of Vaccine. Mother and child were kept for observation. On the seventh day, baby was starting to develop intolerance to feeds and developed Hyperthermia from the Eighth day. The baby was lethargic and was put on Injection Piperacillin-Tazobactam and Injection Amikacin. There was no congestion in chest, bowel sounds were normal. Baby showed no signs of improvement after 5 days of Injection Piperacillin-Tazobactam and Injection Amikacin. The baby was suspected to have Late Onset Neonatal Sepsis and blood was sent for Culture and Sensitivity Testing.

After 5 days of aerobic incubation, culture in blood agar showed non-hemolytic pin-point translucent colonies which turned yellow after 36 hours of incubation. Colonies were catalase positive and coagulase negative and Gram stain showed Gram Positive Bacilli arranged in cuneiform patterns. The colonies were thus of Diphtheroid.

The bacteria did not reduce nitrate, fermented Glucose with acid and gas production, fermented Maltose and slowly fermented Lactose. It did not ferment Sucrose, Mannitol, Mannose, Sorbitol, Xylose, Arabinose. Urea was hydrolyzed after more than 48 hours of incubation (Fig 1).

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Editor's Comment :

- Proper sterilization must be maintained in neonatal care units and hand hygiene of the caregivers must be ensured. Also, the affected neonate should be isolated to prevent a pseudo-outbreak of the infection in Neonatal Intensive Care Unit (NICU).

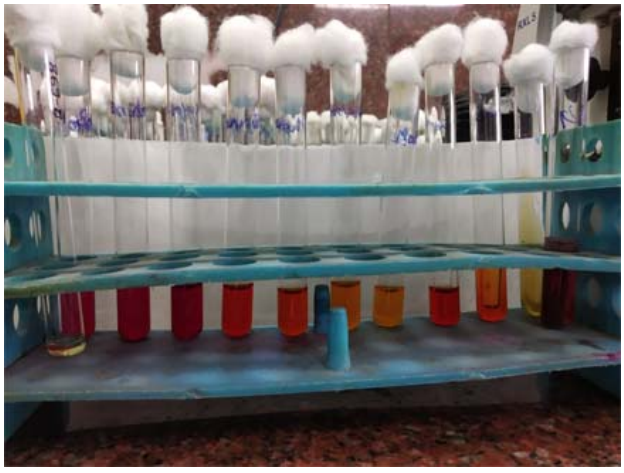

Fig 1 — Biochemical test results for the Corynebacteria isolate.

Antibiotic sensitivity testing revealed, the bacteria was susceptible to Gentamycin, Imipenem, Clindamycin, Vancomycin, Linezolid, Ciprofloxacin, Cefalexin and Meropenem and resistant to Erythromycin, Ampicillin, Chloramphenicol, Penicillin, Cotrimoxazole and Aztreonam[1] (Fig 2).

From the above observations, organism was identified to be *Corynebacterium falsenii.*

Piperacillin-Tazobactam and Amikacin therapy was discontinued and the neonate was put on various combination therapies of Vancomycin, Clindamycin, Meropenem and he showed good clinical response and subsequently defervesced.

Fig 2 — Antibiotic Susceptibility Pattern of the Corynebacteria isolate

Discussion

Corynebacterium species are commensals, and have been isolated from skin, mucous membranes as well as gastrointestinal tract[3]. *Corynebacterium falsenii* had been first characterized and isolated in 1998[5]. Based on 16s rRNA sequencing data, it is most closely phylogenetically related to *Corynebacterium jeikeium* with 2% sequence divergence genealogically[5]. Although it has been previously found among other animals like Eagles and storks[2], after being isolated from sterile sites including blood and CSF[3,5], *Corynebacterium falsenii* has been recognized as a potential human pathogen. Here was report a case of late onset Neonatal Sepsis caused by *Corynebacterium falsenii*.

Phenotypic species level identification of *Corynebacterium falsenii* can be difficult owing to weak/delayed and overlapping biochemical reactions among different *Corynebacterium* species[6-8]. Of all the *Corynebacteria* associated with human specimens, only *C xerosis* and *C falsenii* are non-lipophilic species with yellow pigmentation and the former is distinguished by its characteristic dry colony morphology[8,9]. In our case, the organism had features corroborating with reported expectations from *Corynebacterium falsenii* including smooth yellow pigmented colonies and delayed fermentation of Glucose and slow hydrolysis of Urea. Similar to *C jeikeium*, *C falsenii* is susceptible to Vancomycin, however unlike its close relative, *C falsenii* does not have intrinsic broad antimicrobial resistance[8,9].

In summary, the data reported here on Neonatal Sepsis caused by *Corynebacterium falsenii* supports the postulation that the organism is a cause of clinically significant disease.

Acknowledgement

We thank all the faculty, the Postgraduate Trainees and Medical Technologists of the Department of Microbiology, RG Kar Medical College and Hospital for their support.

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Case Report

Generalised Myoclonus and Cerebellar Ataxia Associated with COVID-19 : A Case Report

Tanu[1], Sumi M Pillai[1], Jayakrishnan MP[1], PR Sowmini[2], M Sathish Kumar[2], K Malcolm Jayaraj[2], S Sakthivelayutham[2], R Viveka Saravanan[3], K Mugundhan[4]

COVID-19 pandemic is a Global burden to Public Health. An array of Neurological Manifestations have been reported to be associated with COVID-19 like Anosmia, Cerebrovascular accident, Meningitis, Encephalitis, Seizures, Guillain-Barré Syndrome (GBS), Acute Disseminated Encephalomyelitis (ADEM) etc. Generalised Myoclonus and Cerebellar Ataxia, is a less common Neurological Manifestation when compared to others. Here, we report a case of Generalized Myoclonus and Cerebellar Ataxia following COVID-19 infection. The possible mechanisms of Myoclonus and Ataxia following COVID-19 are also discussed.

[*J Indian Med Assoc* 2022; **120(1):** 48-9]

Key words **: Myoclonus, Cerebellar Ataxia, COVID-19, Autoimmune pathophysiology.**

Case Report

The COVID-19 pandemic may present with various Neurological Manifestations, of which movement disorders are rare.We encountered this middle aged male with COVID-19 infection who developed generalized Myoclonus and Cerebellar ataxia which responded well to immunotherapy.

A 52-year-old gentleman, diabetic, hypertensive, chronic smoker, non alcoholic presented with complaints of cough and breathlessness associated with generalised tremulousness and unsteadiness of 7 days duration. He had jerky movements of both upper limbs and lower limbs at rest, which was predominantly proximal and exacerbated on doing activities. The unsteadiness was present on standing and walking with sway to either sides while walking. He did not give history of exacerbation of unsteadiness in dark. He gave no history of sensation of walking on cotton wool. There was no history of vertiginous sensation or Tinnitus. He also complained of fatigue, decreased appetite and weight loss. Fifteen days before Admission, he had low grade fever which resolved after taking Anti-pyretics for 3 days.

Examinations **—** On examination, the patient was conscious and oriented. There was no clouding of consciousness. Cranial nerve examination was normal. Bulk, Tone, Power and deep tendon reflexes were normal in all four limbs.The sensory system examination was normal. He had action induced myoclonus involving trunk, upper limbs and lower limbs. He had bilateral horizontal gaze evoked nystagmus, which was ill- sustained. Mild scanning dysarthria was present. Finger, finger- Nose Test and Heel-shin test were suggestive of Bilateral Limb Ataxia. He had severe degree of stance and Gait Ataxia. Tandem walking was not possible. There was no bradykinesia.

Routine blood tests including Complete Blood Count, Random Blood Sugar, Liver Function Tests, Serum Electrolytes and Renal Function Tests were normal. Thyroid profile was normal. HIV serology was negative. Inflammatory markers including CRP, D-dimer, IL-6 and serum ferritin were within normal limits. EEG was normal. CT scan chest (Figs 1&2) showed consolidation in Right Lung with Right Pleural Effusion along with few patchy opacities in left lung suggestive of COVID bronchopneumonia with secondary infection.

MRI Brain with contrast study was normal. CSF analysis was normal. Reverse Transcription - Polymerase Chain Reaction (RT-PCR) for SARS-CoV 2 was positive. Serum Anti-nuclear antigen. Rheumatoid factor, C-reactive Protein (CRP) and Extractable Nuclear Antigen Profile were negative.

The patient was treated with seven days course of IV antibiotics, IV Dexamethasone 8mg tds and prophylactic dose of anticoagulants. Patient was given 4 litres/min Oxygen for 2 days, after which he was maintained on room air. On the 5th day after admission, he was started on Tab Sodium Valproate 600mg/day and Tab

Editor's Comment :

- Neurological manifestations are seen in all grades of severity of COVID-19. So further Neuroepidemiological studies and International registries are needed to help define the full Neurological spectrum of SARS-CoV-2 disease. Further research is needed to prove the plausible post or para infectious origin of Myoclonus and Ataxia.

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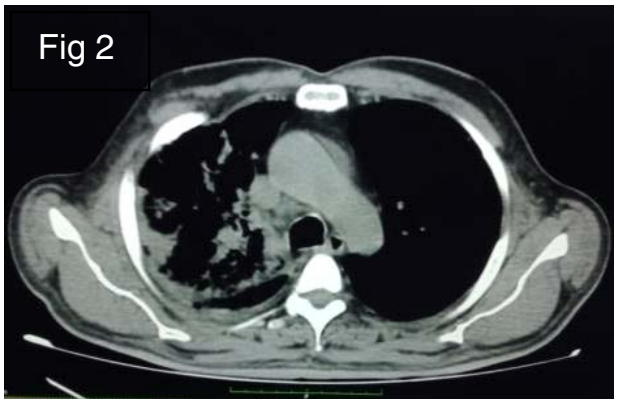

Fig 1 & 2 — CT chest showing consolidation in right lung with right pleural effusion along with few patchy opacities in left lung suggestive of Covid bronchopneumonia with secondary infection

Clonazepam 1mg at bed time for symptomatic management of Myoclonus. Patient improved significantly over the next one week. Repeat CT chest with contrast showed complete resolution of pleural effusion and partial resolution of pneumonia. Sputum was negative for acid fast bacilli.

Discussion

Our patient had subacute onset generalised myoclonus and cerebellar ataxia associated with COVID-19 infection. Respiratory manifestations of COVID-19 are well documented, but rare Neurological manifestations are also being recognised. They are being reported not only in severe cases but also in mild and moderate cases.

Our patient had generalized myoclonus, predominantly involving the proximal limbs. As there was no jerk locked cortical potential in EEG associated with the Myoclonus, the Myoclonus was probably of subcortical origin. The patient had Pancerebellar involvement, as evidenced by Nystagmus, Dysarthria, Bilateral limb ataxia, Truncal ataxia and Stance / Gait ataxia.

The following are the possible mechanisms by which COVID-19 causes neurological complications :[1-3]

- Viral Neurotropism, accompanied by vascular, transcribrial and/or Neuronal retrograde dissemination.
- Autoimmune response, by means of Molecular Mimicry and Cytokine storm.
- Multiorgan dysfunction, due to Cardiorespiratory and metabolic causes.

Our patient had no anosmia or clouding of consciousness. CSF analysis and MRI Brain were normal. Hence viral neurotropism seems less likely. Patient developed myoclonus and ataxia during the 2nd week of illness, progressed over 10 days and later started improving. There were no biochemical abnormalities [Random Blood Sugar (RBS), RFT, LFT and Serum Electrolytes were normal]. There was no history suggestive of hypoxic brain injury. There was no history of intake of drugs causing Myoclonus (like Fluoroquinolones, Opioids, Antipsychotic and Antidepressants). Hence, para infectious etiology of Myoclonus and Cerebellar Ataxia due to autoimmune response seems more likely.

On reviewing literature, we found many case reports[4-6] similar to our case. In the earlier published reports, patients had presented in the 2nd or 3rd week of illness, mean age of presentation was 53.2 years and all patients were males. In the above reports, few patients were on steroids, few patients got steroids and IVIg and few others underwent Plasmapheresis also, depending upon the severity of illness.

But all patients responded well to therapy, indicating an autoimmune Etiopathophysiology. Time of onset of illness after COVID (2nd or 3rd week), subacute course, good response to Immunomodulatory Therapy, monophasic illness and exclusion of structural, metabolic and toxic causes, favour a parainfectious or postinfectious autoimmune response.

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Case Report

Intracranial Calcification in a Case of Seizure Disorder

Sriradha Chatterjee[1], Upoma Saha[2], Srijib Pal[3], Souvik Samanta[3], Paramita Bhattacharya[4], Salil Pal[5], Mrinal Kanti Roy[6]

A patient with repeated episodes of Seizures and elevated Blood Pressure for 2 days, was admitted in a primary care set up initially, followed by admission to our Institute where he was thoroughly worked up to find the possible etiology behind the presentation. Extensive investigations and imaging led to the conclusion that the patient had Idiopathic Intracranial Calcification after the possible secondary causes of Intracranial Calcification were ruled out.

[*J Indian Med Assoc* 2022; **120(1):** 50-1]

Key words **: Seizure, Idiopathic, Intracranial, Calcification, Genetic study.**

Case Report

A 50 year old male from Krishnanagar, West Bengal presented with the chief complaint of repeated episodes of Seizures for last 2 days and was admitted in a primary care set up from where he was referred to our Hospital for further management. On Admission, he had Seizures, manifested as generalised tonic clinic convulsions associated with frothing from the mouth and urinary incontinence. Patient was brought to the Hospital in an unconscious state. There were no definite identifiable precipitating factors for his Seizure at the time of Admission.

Patient is Hypertensive for the last 5 years but was on irregular medication for the same.

There was no history of fever, trauma, vomiting or previous such Seizure attacks. He had no known addictions, there was no history of any high risk behaviour.

His family history was non-contributory as well.

Patient was unconscious at the time of Admission and regained consciousness within a few hours, after conservative management. Pulse rate was 106/min and respiratory rate was 22/min on Admission. His BP was recorded to be 204/102 mm Hg.

SpO2 was 98%. His, Higher Mental Functions (HMF) could not be assessed at the time of Admission. Tone was reduced in all four Limbs and plantar reflex was found to be extensor bilaterally. Pupils were normal in size bilaterally and reacting sluggishly to light.

Examination of the other systems was grossly normal. When he regained consciousness, he was disoriented and restless.

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Editor's Comment :

- Idiopathic intracranial hypertension should be considered as an important, albeit rare differential in a patient with seizures when no other apparent secondary cause can be as certained. While there is no primary intervention, the patient can lead a normal life on symptomatic management. Keeping this differential in mind would help build an important database of the rarer secondary causes of seizures.

He was managed with supportive care and appropriate measures were taken to reduce his BP.

Initial lab investigations showed a Haemoglobin (Hb) of 13.8, normal Total Leukocyte Count (TLC), Differential Count (DC) and Platelets.

Urea, Creatinine, Sodium, Potassium and Liver Function Tests (LFT) were within normal range.

His Integrated Counselling and Testing Centre (ICTC) report was non reactive.

An urgent NCCT Brain was done at admission (Figs 1 & 2).

A Neuro-medicine consultation was taken and as per their advice the following tests were done :

Calcium - 1.27 mmol/l (1.15-1.33 mmol/L)

Magnesium- 2.1 meq/l (1.3- 2.2 meq/l)

Phosphate- 2.91mg/dl (2.5- 4.5 mg/dl)

Intact Parathyroid Hormone (iPTH) - 37.8 pg/ml (15-65 pg/ml)

S Lactate - 0.8 microU/ml (0.5- 1 microU/ml)

MRI brain with contrast was done (Figs 3 & 4)

Patient gradually improved over the next 24-48 hours. He became oriented with a Glasgow Coma Scale (GCS) of 15/15. Power in all 4 Limbs was normal, tone normalised and bilateral plantars were flexor. No neuro deficit was found.

He underwent further tests like Magnetic Resonance Angiography (MRA) and Magnetic Resonance Venography (MRV) keeping a possibility of vessel calcification in mind. Both investigations were normal. A Toxoplasmosis, Rubella Cytomegalovirus, Herpes Simplex (TORCH) profile was done and was also negative. EEG, ECG and Carotid Artery Doppler were done and found to be normal.

As our Lab does not have provision for gene analysis, patient was informed about the constraint and advised to

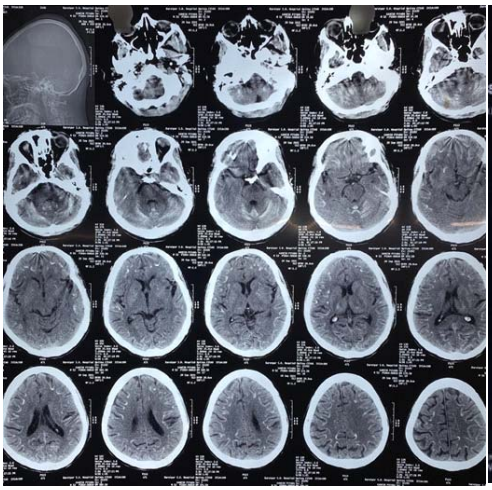
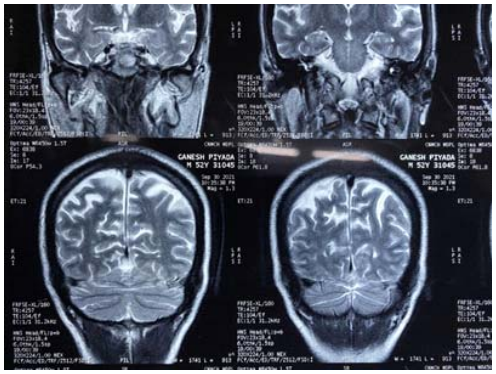


Fig 1 & Fig 2 — NCCT Brain shows diffuse parenchymal hyperdensities along the grey white matter junction and also in the cerebellar parenchyma



Figs 3 & 4 — MRI brain (plain) showing areas of calcification in the cerebellum and areas of apparent demyelination in the thalamus and pons as well as acute lacunar infarction in left frontal lobe.

follow up at a centre with provision for gene analysis for SCL20A2 and PDGFRB.

Patient did not have any further episodes of Seizures after Admission. He was treated with antiepileptics and his Blood Pressure levels normalised with anti-hypertensives. He was discharged with a diagnosis of Primary Brain Calcification (Idiopathic Intracranial calcification) with symptomatic seizures and was put on maintenance antiepileptics.

Discussion

Primary (Idiopathic) Intracranial Calcification, also known as Fahr disease among several other names refers to both familial and sporadic cases of calcification. The term encompasses the calcification of Bilateral Basal Ganglia, along with cerebellum and in some instances, Cerebral White Matter[1].

The onset of primary brain calcification is usually in the fourth to sixth decade[2]. The typical presentations include psychiatric and cognitive manifestations like rest and action tremor, Parkisonism, dystonia, choreoathetoid movements, myoclonus and tics. Rigidity and bradykinesia along with cerebellar signs are also seen[3,4].

Patient can present with Epilepsy, Syncope, Stroke, and stroke-like episodes. Up to one-third of patients may be asymptomatic, even at advanced age.

The most commonly mutated gene is SLC20A2 which accounts for around 40 percent of cases. The next most common gene involved is PDGFRB gene implicated in about 10 percent of cases[5]. In about 50 % of individuals the cause still remains unknown.

Diagnosis of the condition is by Neuroimaging techniques such as Computed Tomography (CT) of the brain (the most sensitive technique) and Magnetic Resonance Imaging (MRI). MRI has been reported to be normal or falsely suggestive of demyelination in a few patients with CT proven diffuse calcification[6]. The lack of biochemical abnormalities or infections like CMV and other TORCH infections, trauma, exposure to toxins and heavy metals makes the diagnosis of Idiopathic Intracranial Calcification very likely.

Further Genetic Testing for the implicated mutation helps narrow down the diagnosis.

Symptomatic treatment remains the only option till date and genetic counselling has been strongly advised, especially for individuals with Platelet-Derived Growth Factor (PDGF) mutation.

Conclusion

There are a myriad of secondary causes of Seizure Disorder. However, it should also be kept in mind that Idiopathic Intracranial Calcification, though rare, can manifest with the above presentation. Though the genetic analysis could not be done due to certain constraints, it can be assumed that when the other possible causes are excluded, this becomes the most likely possibility behind the seizure and the patient would need treatment with anti-epileptics for a good outcome and a normal life.

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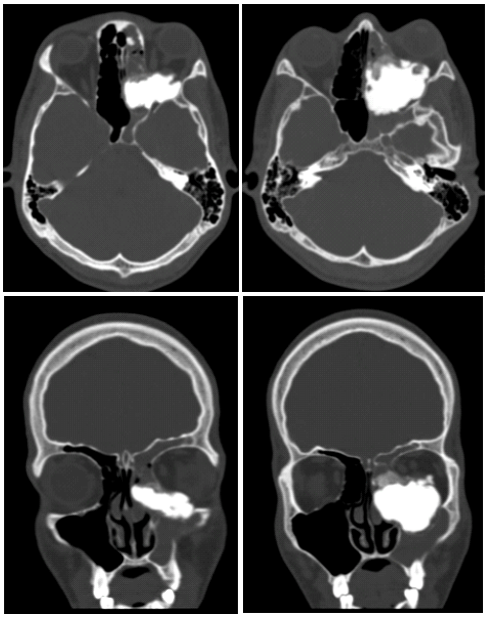
Image in Medicine

Bhoomi Angirish[1], Bhavin Jankharia[2]

Quiz 1

CT scan images of a 38 year old man who presented with nasal blockage and left side proptosis.



Questions :

(1) What is the diagnosis?
(2) What are the common locations?
(3) What is the differential diagnosis?

Answers :

(1) Well defined dense lesion (density similar to cortical bone) is seen in left posterior ethmoid sinus showing exophytic extension into orbital apex. Findings are in favour of osteoma of paranasal sinus.

(2) Osteomas are frequently seen elsewhere in the head and neck region, particularly in mandible and outer table of skull vault. Their frequency of distribution within the paranasal sinuses is as follows: Frontal sinus (~80%), ethmoid air cells (~15%), maxillary sinus (~5%) and sphenoid sinus (rare).

(3) The imaging differentials include fibrous dysplasia - which is less dense and shows ground glass density. Osteogenic tumours such as osteoblastoma and osteosarcoma are other differentials.

Quiz 2

A 24 year old man presented with orbital injury and blurring of vision.

Questions :

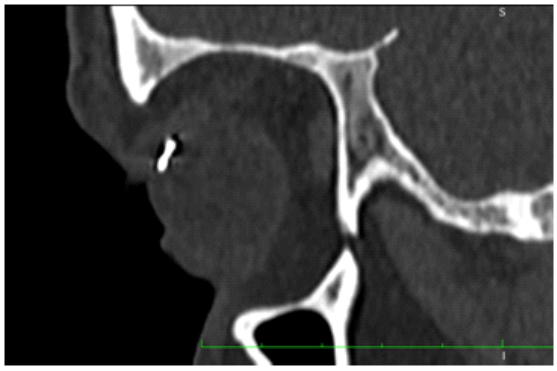
(1) What is the diagnosis?

(2) What is the role of various imaging modalities in ocular injury?

Answers :

(1) Hyperdense foci with streak artefacts is seen in intraocular compartment of left orbit, suggestive of metallic intraocular foreign body.

(2) Ultrasonography can be useful for detection of associated ocular injuries like vitreous hemorrhage, vitreous detachment, however it does not precisely determine the location of foreign body.



CT scan is preferred modality in case of metallic foreign body. It also helps to detect associated bony injuries.

MR imaging may be considered superior to CT if the intraocular foreign body is composed of wood; however, MR imaging is contraindicated if any possibility exists that the intraocular foreign body is composed of metal.

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Student's Corner

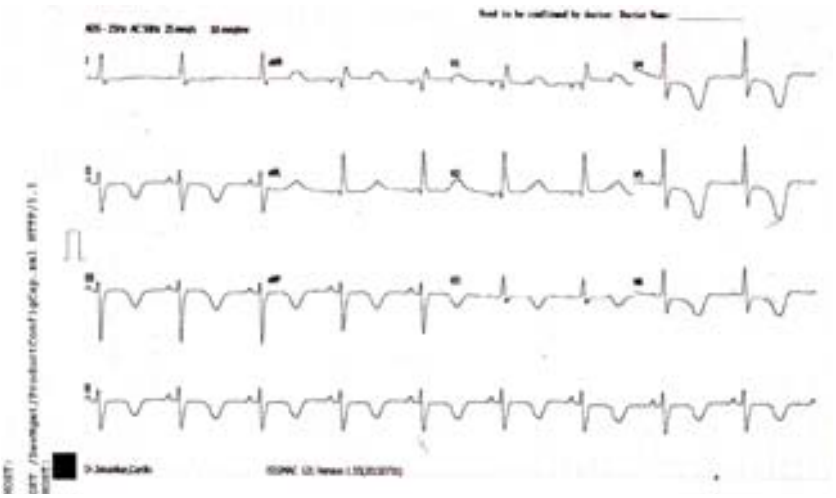
Become a Sherlock Holmes in ECG

M Chenniappan[1]

Series 1 :

"The Terrible Ten"

This is the ECG of 60-year-old Female who has chest pain and intermittent dizziness.



Questions :

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

Answers :

(1) ECG CHANGES :

The ECG shows complete RBBB, Left Anterior Fasicular Block (LAFB) with a P wave in the ST segment of all beats. Most of the leads shows deep,broad, symmetrical T inversions with prolonged QTc. The PR interval is normal and constant. The P wave in the ST segment can be either Atrial Premature beat or a sinus P which is not conducted to the ventricles. As the P-P intervals including non conducted P waves are constant, it is likely that this P in ST segments is non conducted sinus P. If it is APD, conducted Sinus P to non conducted P in the ST segment is likely to be short when compared with other P-P intervals. It is ideally called as "non-conducted" rather than "blocked"P because it is falling in a period where it is not expected to be conducted. The deep broad symmetrical T inversion is unlikely due to Acute Coronary Syndrome (ACS) like "Wellens syndrome" because the QTc is prolonged and it is diffuse. There is no initial r in V1 and initial q in V5 V6 indicating Antero Septal MI(ASMI). There is homophasic ST T changes with RBBB.

The deep broad symmetrical T inversion with prolonged QTc is probably due to recent "Strokes Adam Attack"

(2) CLUE :

The overall 10 ECG findings are :

1. Complete RBBB
2. Left Anterior Fascicular Block
3. 2:1 AV conduction
4. Anteroseptal MI
5. Deep Broad symmetrical T inversion
6. Prolongation of QTc
7. Homophasic ST T changes in the presence of RBBB
8. Probable recent Stokes Adams attack
9. Dominant RBBB (presence of terminal r in L1 in the presence of LAFB)
10. "Pseudo" Wellens

As this ECG has "Ten" terrible changes which may be dangerous to patient's life, the clue of "The Terrible Ten" is given.

(3) PRACTICAL IMPLICATIONS :

In the presence of advanced conduction disturbances such as RBBB, LAFB and 2:1 A.V. Conduction, the broad, symmetrical deep inversion represent recent stokes Adams Attacks. (Stoffweschsel syndrome). This T inversion in advanced A.V.Blocks or sinus node disorders, represent recent transient brain ischemia like the ECG changes which happen in CVA. Although, this patient does not have typical syncope, the dizziness may represent episodes of pre syncope and it is the definite indication for Permanent Pacemaker Implantation. The presence of ASMI, and homophasic ST T changes in RBBB represent occult CAD, and she also needs Coronary Angiogram to decide about further management of CAD.

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Letter to the Editor

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

The Road not taken : A Perspective of a Medical Professional's Inability to Choose between Clinical Practice or Postgraduation Degree after Internship

Sir — A PG (Postgraduation) degree has almost become a requisite to pursue medical profession in India. A major part of such degrees rely on the clinical mastery of the doctors but to our dismay, the clinical exposure we get during our MBBS courses and internship does not adequately prepare us for such bigger roles. Patients' outlook has gradually changed over time and it has been often seen that a doctor with a MD or DM degree is preferred over a "suboptimal" MBBS degree, as stated by a few patients. This has subjected the young doctors into a fierce academic competition to crack entrance examinations like NEET (National Eligibility Entrance Test), INICET (Institute of national importance combined entrance test) etc. The race is getting tougher day by day in a constant crescendo so much so that it has almost become a norm to dedicate a year or two only for "PG preparation". A vast majority of the aspirants are getting enrolled in various online courses completely sacrificing the clinical exposure of working in a hospital. The internship courses showcase a mere orientation programme with scanty clinical exposure. In most of the hospitals internees are made to fill up charts, perform phlebotomy, insert catheter, write requisitions etc and are seldom a part of the clinical decision making process. After completing the internship, if we are again detaching ourselves from clinical exposure and devoting years to post graduation entrance, is it compromising our clinical acumen further? Having said that, now if we take into account a budding doctor's point of view, the need for post-graduation in India has outweighed the requirement of clinical practice in a doctor's career. The question pattern keeps changing every now and then, leaving them with meagre time to balance between their yearning for clinical experience and simultaneously preparing for the mutating MCQ (Multiple Choice Question) pattern. For example, just a few years ago image based questions were rarely asked but with the commencement of computer based tests, questions with CT (Computed Tomography)scan, X-ray, clinical images are commonly asked and without a rigorous practice it is not possible to get success in these entrance tests. After getting into a PG course it is very difficult to have the necessary experience of the other specialities, which is a sine-qua-non to become a successful physician of any speciality. Joining a clinical branch for postgraduation with sparse clinical experience and suddenly being given the huge responsibility of treating patients ultimately results in compromised patient-care at times. Moreover, there is heterogeneity in the work culture or duties of internees in different states. So, the degree of clinical exposure keeps varying from one Post graduate trainee to another. The regulatory authority should take this issue into account to ensure optimum patient care. A mandatory and uniform clinical orientation course for the post graduate trainees all over India can probably bridge the gap of clinical experience and align them better into the clinical practice.

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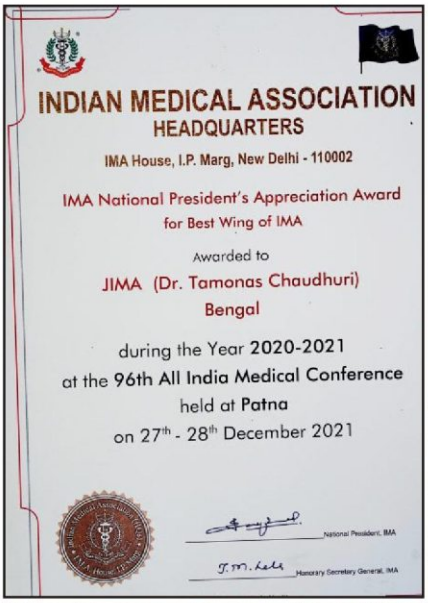

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