



COVID-19 EXPERIENCE AT A NON-COVID REMOTE MULTI-SPECIALITY HEALTH CENTRE

Anaesthesiology

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ABSTRACT

Background- Coronavirus disease 2019 (COVID-19) pandemic has affected all emergency branches, and likewise, its incidental diagnosis, as well as a varied neurological presentation, presented as a new war for health centers situated at resource constraint remote peripheries. **Objective-** on the basis of a set admission protocols we tried to identify circulating and radiological indicators in the suspected COVID-19 patient population, to triage them, till the confirmation of their COVID-19 status. **Methods and Material-** We did a retrospective analysis of hemogram, other blood investigations and chest X ray of all patients who were admitted in Lifeline hospital Azamgarh from 5th May 2020 to 11th September 2020 and diagnosed later on as COVID-19 positive. **Results-** The most significant findings were Lymphopenia (absolute lymphocyte count [ALC] $< 2 \times 10^9/L$) in 52.9% patients with 4 having mild (ALC $1-2 \times 10^9/L$), and five with moderate lymphopenia (ALC $0.5-1 \times 10^9/L$). Another finding was Monocytopenia ($< 0.2 \times 10^9/L$) present in 9 (52.9%) patients and eosinopenia in one patient. Platelet count were almost normal, with only 3 (17.6%) patients having mild to moderate ($50-150 \times 10^9/L$) thrombocytopenia. Raised levels of C- reactive protein (CRP) was present in 5 (29.4%) patients. Chest X Ray was abnormal in 2 (11.8%) patients with bilateral ground glass opacities (GGO). **Conclusions-** We found almost same findings on chest X-ray and in blood investigation like raised haemoglobin level, leukopenia, lymphopenia, eosinopenia and raised CRP level in this highly specialized small patient population like other studies, hence their presence have the potential to indicate SARS-CoV-2 infection, during the covid pandemic irrespective of specialities.

KEYWORDS

COVID-19, Coronavirus, Neurological manifestations, Neurosurgical patient.

INTRODUCTION-

In history 21st century will be known by the Coronavirus disease 2019 (COVID-19) pandemic, which make the humanity to bow at its knee, no one was knowing the management of novel Corona virus in the world. The situation is even worse at remote peripheries where not only the treatment, but also the availability of diagnostic armamentarium is a crucial issue. We are a remote periphery neurosurgical based busy multispeciality center where patients presented with the varied neurological manifestation, as well as asymptomatic incidental diagnosis in neurosurgical emergencies became a big challenge for us, and forced us to find out solutions from the available resources.

MATERIAL AND METHODS

We did a retrospective analysis of all patients who were admitted in Lifeline hospital Azamgarh from 5th May 2020 to 11th September 2020 and diagnosed later on as COVID-19 positive. Due to scarcity of availability of investigations in initial days, especially RT-PCR for COVID-19, we make an admission protocol based on history, examination, basic blood investigations and chest x-ray postero-anterior view in every patient. Apart from presenting illness, we enquire every patient with detailed evaluation of signs and symptoms related with fever, cough and respiratory distress along with recent abroad travel history and history of close contact with an RT-PCR confirmed COVID-19 positive patient. In blood examination, we look for complete blood counts, liver function tests, renal function tests, serum electrolytes and C-reactive protein.

Being a non-COVID hospital, we admitted only those patients, who were not having COVID-19 related positive history or significant findings. After admission we investigate every patient for nasopharyngeal and throat swab RT-PCR for COVID-19, but being situated at remote periphery, we routinely got the reports with a minimum of 3 days delay. During this time we keep them in the holding area, and depending on COVID-19 status, we use to refer them to COVID-19 centres or shift them to our routine wards. We analyse the hemogram, other blood investigations and chest X ray to identify circulating and radiological indicators in this specific COVID-19 positive patient population.

RESULTS

After following our admission policy of initial screening, we admitted 570 patients in this duration and found 17 positive patients on COVID-19 RT-PCR later on, with male, female ratio 9:8, having an age range

between 14 to 65 years and subsequently refer them to COVID-19 centres for further management.

As per diagnosis (14 emergency and 3 elective cases) at initial presentations, our 6 (35.2%) patients were of stroke (2 aneurysmal bleed, one anterior communicating and other one was middle cerebral artery aneurysm who were diagnosed as COVID-19 positive incidentally, 3 ischemic strokes and 1 haemorrhagic stroke), and 5 (29.4%) of head injury. Among 2 (11.76%) patients who presented with seizures, one was diagnosed as viral meningitis with possibility of COVID-19 meningitis [cerebro spinal fluid (CSF) RT-PCR COVID-19 was not done in this patient] and the second was a case of multiple inflammatory granulomas in brain with possibility of Tuberculomas on contrast CT Head (contrast MRI Brain and spectroscopy was not done). One patient presented with confusion and disorientation and was having normal imaging and CSF study, was subsequently diagnosed as COVID-19 positive. Rest 3 patients were elective cases and were admitted only for surgery, incidentally diagnosed as COVID-19 positive.

In blood analysis except 2 head injury patients whose haemoglobin (Hb) was less than 9gm%, the rest were all having a Hb level more than 11gm%. We observed moderate leukopenia (WBC $< 6 \times 10^9/L$) in 4 patients (23.5%), whereas 4 (23.5%) were having leucocytosis (WBC $> 12 \times 10^9/L$).

The most significant findings were Lymphopenia (absolute lymphocyte count [ALC] $< 2 \times 10^9/L$) in 52.9% patients with 4 having mild (ALC $1-2 \times 10^9/L$), and five with moderate lymphopenia (ALC $0.5-1 \times 10^9/L$). Another salient finding was Monocytopenia ($< 0.2 \times 10^9/L$) present in 9 (52.9%) patients. Platelet counts were normal in most of the patients with only 3 (17.6%) patients having mild to moderate ($50-150 \times 10^9/L$) thrombocytopenia.

Raised levels of C- reactive protein (CRP) was present in 5 (29.4%) patients. Among these, one of our stroke patients who was thrombolysed and admitted in ICU, was having CRP level 207.3 mg/L with Eosinopenia with a 0-eosinophil count and Chest X ray showing bilateral ground glass opacities (GGO).

Apart from a mild increase in blood urea (observed in 3 patients), serum creatinine was normal in all patients. Raised liver enzymes were found in 5 (29.4%) patients with normal serum bilirubin. Chest X Ray was grossly abnormal only in 2 (11.8%) patients with bilateral GGO.

DISCUSSION-

Since its inception COVID-19 is known for its highly contagious nature. It's varied neurological manifestations, both as asymptomatic incidental diagnosis in a patient admitted for routine elective surgeries including trauma patients, as well as masquerading presentations in the form of almost all commonly seen neurological emergencies ranging from headache, dizziness and altered mental status to stroke (acute ischemic stroke, cerebral venous sinus thrombosis and cerebral haemorrhage), seizures, meningo-encephalitis and Guillain-Barre' syndrome is now well known and found more frequently in severe COVID-19 patients as compared to non-severe one.^[1]

Even at our non-COVID centre, 3% hospitalizations were found to be COVID-19 RT-PCR positive who were not having any suggestive features. In such a scenario where COVID-19 were a likely possibility in almost all patients, finding an easy, readily available, a cost effective diagnostic tool with good sensitivity in an emergency department was a real challenge in all emergency branches. RT-PCR is the gold standard and reference for COVID-19 diagnosis. CT thorax is having high sensitivity (97%) but poor specificity (25%), and it cannot be used in every patient as a screening tool, because of cost issues and concern of radiation.^[2]

As a part of the initial screening at fever clinic, haematological parameters have been recommended by many authors in literature during this COVID-19 pandemic and their role as circulating biomarkers have been evaluated both for diagnosis and prognosis.

Complete blood counts, which include white blood cell count, neutrophil, lymphocyte, eosinophil, monocytes and platelet count as well as their ratio like Neutrophil lymphocyte ratio (NLR), Platelet lymphocyte ratio and systemic inflammatory index (SII) have been used as inflammatory markers. It has been proposed by Eren and colleagues that a low value for NLR, SII, leukocytes, lymphocytes and platelets with raised haemoglobin level may have diagnostic importance in COVID-19.^[3]

A combination of Eosinopenia and elevated high sensitive CRP has been shown by Li to have a positive predictive value of 72.7%, with Eosinopenia alone having a sensitivity of 74.7%, making it as an early diagnostic marker of COVID-19 during an epidemic.^[4,5] The level of plasma CRP has been found as an early indicator of disease severity.^[6]

It was hypothesized by Pence that monocytes could be principal players in cytokine storm and associated pathologies in COVID-19 and we are reporting this significant incidence of Monocytopenia in our series.^[7]

In asymptomatic and early COVID-19 patient's chest X ray usually remain normal, but in symptomatic patients its sensitivity had been reported up to 68.1%, with the appearance of bilateral GGO, reticular-nodular opacities, consolidations and pleural effusions.^[8,9]

We found almost same findings on chest X-ray and in blood investigation like raised haemoglobin level, leukopenia, lymphopenia, eosinopenia as well as raised CRP level even in this highly specialized small patient population, like other studies.

Our biggest limitation of this study were , being a non COVID-19 center, our number of patients are very small and it is difficult to draw any conclusion with it, and as we had referred these patients to COVID-19 centres, we don't have any follow-up data for the same.

CONCLUSION-

With our study it is apparent that neurosurgical patients are not different from others for COVID-19 and even in them the presence of abnormalities like leukopenia when associated with lymphopenia, eosinopenia, monocytopenia and raised CRP if present, have the potential to indicate SARS-CoV-2 infection during the present pandemic. The fact that combination of severe lymphopenia, 0 eosinophil count and significantly raised CRP is indicative of bad prognostic markers, is true for this patient group also. A significant Monocytopenia is observed by us.

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