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Case report

A case report of nosocomial infection with SARS CoV-2 in a one-year old meningoencephalitis patient in a tertiary hospital of Bangladesh.

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ABSTRACT

Introduction: Novel corona virus (SARS-Coronavirus-2: SARS-CoV-2) which emerged in Wuhan, China, has spread to multiple countries rapidly. Little information is known about nosocomial infections by SARS-CoV-2 in the initial period. As it spreads across the globe, physicians face the challenges of a contagious pandemic including patient isolation and diagnosis. **Case Report:** We report a case of concurrent meningoencephalitis and COVID-19 infection in a one-year old Bangladeshi patient who was brought a tertiary hospital in Dhaka, Bangladesh due to fever, convulsion and neck stiffness accompanied by unconsciousness later. Computed tomography (CT) SCAN of brain showed excessive encephalopathic change in both cerebral hemispheres with moderate communicating hydrocephalus, suggesting meningoencephalitis. During his hospitalization, he became infected with SARS-CoV-2 which was confirmed by real time polymerase chain reaction (RT-PCR). **Conclusion:** SARS-CoV-2 can be rapidly transmitted patient-to patient regardless of whether they have symptoms or not. Each hospital must differentiate patients with known or suspected COVID 19 infection from patients with a low probability COVID-19 infection in order to limit direct or indirect transmission.

Introduction

The current outbreak of novel Coronavirus (SARSCoV-2, previously 2019-nCoV) was first reported in Wuhan, China, on 31 December 2019 [1]. Since then, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) has generated 8320288 confirmed cases of Coronavirus disease 2019 (COVID-19) including 447628 deaths as of 18 June 2020 around the world [2]. COVID-19 can

cause a devastating bilateral, multilobar pneumonia, acute respiratory distress syndrome, and death [3,4]. A preliminary report warned that SARS-CoV-2 could have neuroinvasive potential because some patients showed neurologic symptoms such as headache, nausea, and vomiting. In order to end the pandemic of SARS-Coronavirus-2 diseases, the diagnosis of the disease must be prompt and not overlook any findings [5].

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An infection is said to be nosocomial if it appears during or following a hospitalization (or outpatient care) within 72 hours and if it was not present, nor in incubation, when the patient was admitted. These criteria are applicable to any infection. These infections may have a poorer prognosis than community acquired infections, as reported by Li et al. who reported nosocomial infection with SARS-Cov-2 after thoracic surgery in 13 patients, five of whom died [5].

Aim of the work

The aim of this work was to show and report a case of a child as case report, who was hospitalized due to convulsion accompanied by unconsciousness, and was diagnosed with aseptic encephalitis and later developed infection with SARS-CoV-2, in order to improve patient management during this pandemic period.

Case presentation

A 1-year-old child was admitted in Mugda Medical College Hospital, Dhaka, Bangladesh with the complaints of convulsion which persist more than 2 to 3 minutes and 5/6 times in day along with low grade fever, cough and neck stiffness. His parents gave history of intermittent fever for 15 days and repeated convulsion for the last 5 days. Upon arrival at our hospital, he had a Glasgow coma scale (GCS) of 6 (E4 V1 M1), cranial nerve examinations normal with hemodynamic stability. He was admitted in local hospital for 5 days before admitted in our tertiary hospital.

Vital signs revealed a temporal temperature of 39° Celsius (C), heart rate 93 beats per minute (bpm), respiratory rate 18 breaths per minute, blood pressure 90/60 millimeters of mercury (mmHg), and oxygen saturation (SpO₂) 98% on room air. He had clear lung sounds bilaterally, a normal cardiovascular examination. He had no history of sore throat, rhinorrhea and diarrhea.

His complete blood picture was normocytic and normochromic. The cell counts and erythrocyte sedimentation rate were within normal limits except neutrophils (neutrophilia). Lactic acid, basic metabolic panel, hepatic panel, and lipase were within normal limits. Blood urea nitrogen, serum calcium, serum creatinine (1.2 mg/dL) and serum electrolytes were within normal range. Routine examination of her stool was negative. Blood cultures were negative for bacterial growth.

In view of the history and clinical features, he was initially diagnosed as meningitis/encephalitis. Cerebrospinal fluid (CSF) analysis showed a normal white blood cell count (0.4 cells/cumm and lymphocytes 100%), normal proteins (26.6 mg/dL) and normal glucose levels (50 mg/dL). Anti- HSV 1 and Varicella-Zoster IgM antibodies were not detected in serum samples

Ultrasonography (USG) of brain showed raised brain parenchymal echogenicity with loss of sulci and gyri pattern- suspected meningo-encephalitis along with subdural effusion. Computed tomography of the brain revealed Excessive encephalopathic change in both cerebral hemisphere with moderate communicating hydrocephalus possibly due to HIE (Hypoxic Ischemic Encephalopathy).

Conservative treatment was given for the consecutive days. The patient was treated initially with phenobarbitone, maintenance of IV fluids and other symptomatic treatment. But condition did not improve. On 4th day, SpO₂ became 79% with 8L O₂ with face mask but became unconscious at noon. Then he was transferred intensive care unit for better management where hood/head box oxygen device applied with delivery of 10-12 L/min of oxygen after that saturation becomes normal (SpO₂>92%). So, he was not given on mechanical ventilation. At this point, the RT-PCR test for SARS-CoV-2 was performed using a nasal swab, which came out positive (20/05/2020). RT PCR for CSF not done due to unavailability. On 5th day, he also developed high grade fever (103°F) with increasing secretion, portable X-ray chest showed bilateral pneumonia. Computed tomography scan of chest was not done. Broad spectrum antibiotics were given along with low dose steroid. He was not given any anti-viral drug rather treated conservatively for COVID.

After 10 days of admission in our hospital, when he was afebrile, regain consciousness-GCS improved to 13/15, breathing difficulty improved and saturation become stable with then the patient was shifted to the isolation ward. As he can't feed orally, he was on NG feeding from the 1st day to till now. After 14 days, his RT-PCR for SARS-CoV-2 test became negative and his all other vital parameters improved, he was started normal diet along with breast feeding. After that on 24th day following admission the baby was discharged with necessary follow-up advice.

Discussion and Conclusion

This case draws to light the significant COVID 19 exposure risk from one patient to another. This article reports a case of patient who acquired nosocomial SARS-CoV-2 infection during his hospitalization for meningoencephalitis. In the present case, CT SCAN of brain showed excessive encephalopathic change in both cerebral hemisphere and also USG of brain showed raised brain parenchymal echogenicity with loss of sulci and gyri pattern which suggested as a case of meningoencephalitis. Later the patient developed SARS-CoV-2 infection. He was admitted in local hospital and from there he was shifted to tertiary hospital for better management. This infection is considered nosocomial since it was diagnosed during his staying in hospitalization.

As isolation measures to wear a mask were not practiced during early days of pandemic, the viral transmission could have been linked to community contact from outside. In patients who are infected in the hospital, the mechanism of viral spread is not well defined. It could be direct contamination from visitors, from caregivers or from other patients, where the child was hospitalized initially. In addition, it is known that SARS-CoV-2 infection can be asymptomatic [6].

In fact, the majority developed complications that required admission to the ICU, and numerous imaging or interventional radiology examinations. A last possible mechanism is linked to the movement of patients within the hospital [7]. In the absence of systematic screening of patients and caregivers, this could generate contamination [8].

The risk is increased in a malnourished patient and also in immune compromised cases. For the hospital community, there is a risk is of transforming a negative health care staff into a COVID-19 positive cases [7]. During hospitalization, any clinical sign suggestive of SARS-Cov-2 infection or any contact with an infected patient or caregiver should lead to testing [8]. Previous study suggests that human CNS maybe susceptible to coronavirus infection [9].

During this epidemic period, preventive measures were instituted to minimize the risk of contamination in hospital departments. So, refresher training of healthcare staff, increased use of alcohol-based hand rub and repeated hand washing, as well as the systematic wearing of surgical masks and gloves. Now days, hospital visitors were restricted in Bangladesh. It is also advisable to reduce hospital stay as much as possible by taking advantage of telemedicine.

We claim that this case is important because this case shows that any patients are potentially infected by SARS-CoV-2 and it can alert for the medical community. In order to end the pandemic of SARS-CoV-2 diseases, the diagnosis of the disease must be prompt and not overlook any findings.

Figure 1. CT SCAN of brain showed excessive encephalopathic change in both cerebral hemispheres with moderate communicating hydrocephalus.

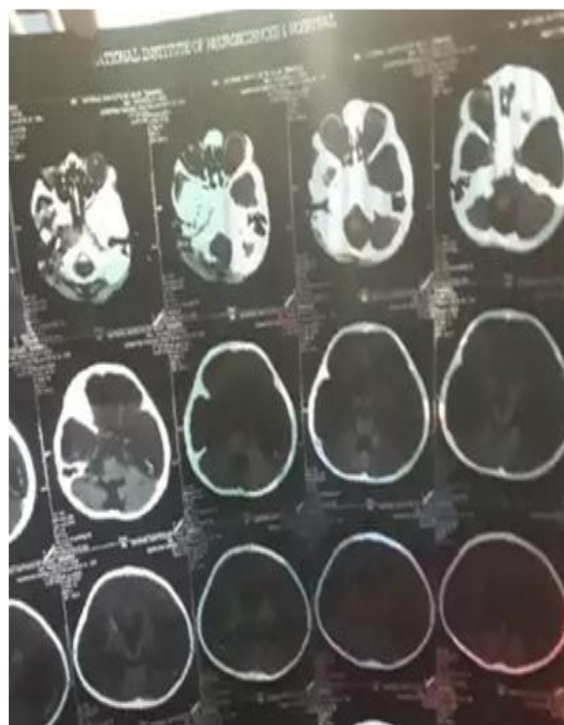
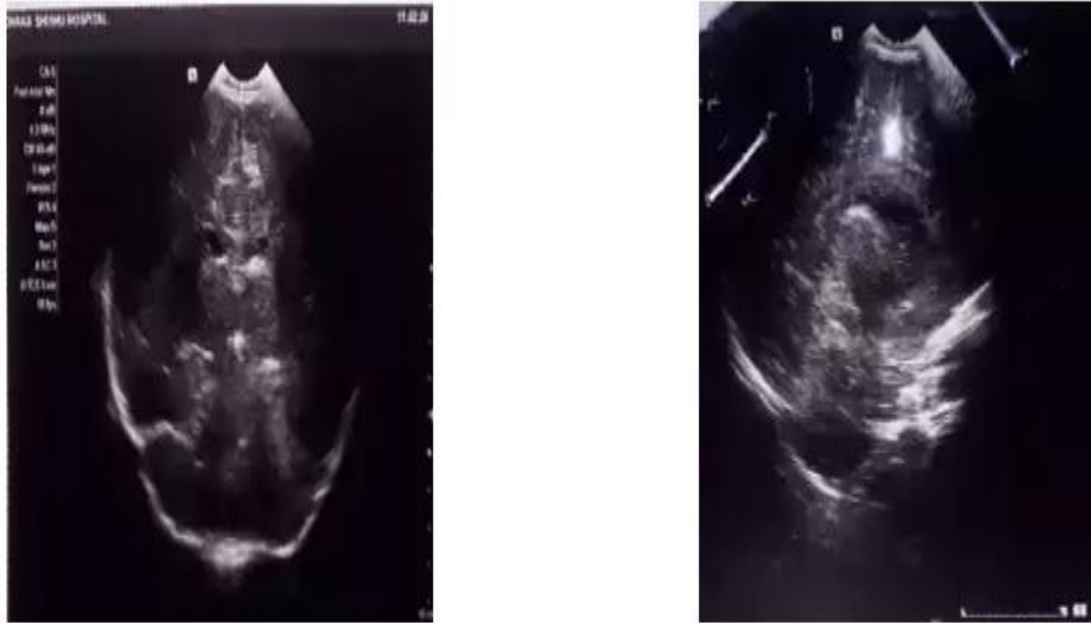


Figure 2. USG of brain showed raised brain parenchymal echogenicity with loss of sulci and gyri pattern.



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Conflicts of interest

The author declares there is no conflict of interest. Patient's father has given written consent for publication.

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