

Socio-Demographic and Clinical Profile of COVID-19 in Children

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Abstract

Background: Coronavirus disease 2019 (COVID-19) caused by SARS-CoV-2 is a global pandemic. Infection by COVID-19 in children is not so common but gradually the numbers of children affected with COVID-19 are increasing day by day. Covid-19 has spread around Bangladesh and children are also being infected with comparatively fewer symptoms and lower case-fatality rates. To describe the epidemiological and clinical characteristics of hospitalized children with COVID-19.

Materials and methods: This cross sectional observational study was conducted among 154 COVID-19 children who were admitted in COVID-19 dedicated Chattagram Maa Shishu O General Hospital, Chattagram from 15 April 2020 to 21 August 2022. Their signs, symptoms, sex, age distribution, laboratory results and familial contact were analyzed.

Results: Among 154 children total RT-PCR positive cases were 82 (52%) and suspected cases were 72 (47%). Among positive cases male-female ratio was 1.78:1. Most of the children (64%) were in school going age (6-18 years). 70% children were from urban area and 30% from rural area. Most of the children (78%) came from middle and upper middle socioeconomic group and 22% from lower socioeconomic group. About 74% children were affected from family member. Main symptoms of the children were cough (72%), and fever (62%), fever with cough (56%) and diarrhoea (26%). About 58% of the children had additional symptoms including sore throat, nasal congestion, fatigue, headache, body ache, vomiting, abdominal pain, 32 patient came with shortness of breath. 7 patients had comorbidities. Among those 1 with CKD, 1 CP, 2 TB and 3 patients had asthma. Total 6 patients were died, 2 patients from positive cases and 4 patients from suspected cases. Among those 1 was CP child. About 14% patients showed lymphopenia, 14% showed leucopenia, 38% patient had neutropenia. C-Reactive Protein (CRP) and serum ferritin were high in only 52% and 38% cases respectively. There were 30% patients who had normal Chest X-Ray and 12% had bilateral consolidation and 58% had patchy opacities.

Conclusion: The clinical manifestations in children are variable. However, fever and cough have mostly been profiled. Though the severe condition is rarely reported in children compared with adults, life-threatening complications, and death associated with COVID-19 disease have been documented. But it is evident that they may play a role in transmission of disease.

Key words: Coronavirus disease 2019; Children; Clinical profile; SARS-CoV-2.

INTRODUCTION

In the history of Human beings, there have been different pandemics, such as Cholera, bubonic plague, smallpox and influenza.¹ In the 21st century, most of the pandemics were caused by either coronavirus or influenza virus.² The cause for the

current COVID-19 pandemic is also coronavirus. The World Health Organization (WHO) stated Coronavirus disease 2019 as a pandemic on March 11, 2020. The etiology for Coronavirus disease 2019 is a newly identified virus called SARS-CoV-2.³ Novel corona virus spread throughout the world from Wuhan since December 2019. On 11 February 2020, WHO declared that the corona virus disease 2019 (COVID-19) was caused by novel coronavirus.⁴ On 12 March 2020, WHO announced that COVID-19 had reached pandemic status.⁵ Corona virus are family of enveloped, single stranded zoonotic RNA viruses belonging to the family coronaviridae order Nidovirales.^{6,7} Corona virus may cause respiratory problem, gastrointestinal problem, severe Acute Respiratory Distress Syndrome (ARDS), coagulopathy, multi-organ failure.⁸ Severe Acute Respiratory Syndrome (SARS) COV-2 is transmitted by direct contact with infected person or by inhalation of droplets by sneezing and coughing of an infected person.⁹ Due to close family contact children are very vulnerable for COVID-19. About 56% of COVID-19 demonstrate clear evidence of transmission through family gathering.^{4,10} Children and young people comprise only 1-2% of cases of Coronavirus Disease 2019 (COVID-19) world wide.^{11,12,13} In contrast to other respiratory viruses, children seem to have a lower risk of infection than adults and the vast majority of reported infections in children are mild or asymptomatic, with few recorded childhood fatalities attributed to covid-19.^{14,2,15-17} Initial reports from China showed that only 0.6% of children with COVID-19 were critically ill.¹⁵

Common presentations are fever and dry cough, fatigue, body ache, nasal congestion, runny nose, sneezing, sore throat, dizziness, diarrhoea, vomiting and abdominal pain. Some children show only cough or diarrhoea and some are asymptomatic carrier.⁴ Few children may come with Multisystem Inflammatory Syndrome (MIS) Kawasaki disease, convulsion or respiratory distress.¹⁸ According to clinical characteristics, paediatric cases with COVID-19 can be divided into asymptomatic infection, mild, moderate, severe and critical.^{4,9} Asymptomatic, mild and moderate infection comprise over 90% of all children who have tested positive for COVID-19 with fewer severe and critical cases (5.9%) compared to adults (18%).^{9,15} Milder Infection in children due to under developed immune response and less number of Angiotensin Converting Enzyme-2 (ACE-2) receptors and also less contact with infected person because most of time they reside in home. The median age of paediatric cases is 6.7 years and no sex preponderance were seen.^{9,16} In this study, the experience in terms of clinical presentation, demographic data, laboratory analysis and radiological finding of patients were shared.

MATERIAL AND METHODS

This cross sectional observational study was conducted among children who were admitted in COVID-19 dedicated Chattagram Maa Shishu O General Hospital, Chattogram from

January 2021 to December 2021. The inclusion criteria were Patients aged day 1 to 15 years. Total 154 patients were enrolled in this study. The medical data was analyzed from previously taken questionnaire for each patient. Demographic data, medical history, contact history was included in the questionnaire. Signs and symptoms including fever, cough, vomiting, diarrhea, abdominal pain, headache, body ache, fatigue, no symptoms and hospital stay were recorded. Investigation reports were RT-PCR, leukocyte count, total neutrophil count, lymphocyte count, levels of CRP, serum ferritin, CXR were analyzed. Regarding CT chest children with mild disease should not routinely need CT chest imaging in view of high radiation exposure.¹⁹ We took written permission from the local authority for the study. A written consent had taken from attendants/parents as well. Collected data were analyzed by SPSS version 23.

RESULTS

Total number of cases of paediatric age group was 154. Among those 82 (52%) patients were confirmed by RT-PCR. Study showed percentage of male (64%) and female (36%). It showed age distribution of children which were 0- 5 years (36%), 6-10 years (20%), 11-18 years (44%). Mean age of children was 8.6 years. Most of children (64%) were school going (5-15 years). It was also found that 70% children were from urban area and 30% from rural area. Among all patients 78% came from middle and upper middle socioeconomic group and 22% from lower socioeconomic group. About 74% patients had history of contact with COVID-19 positive cases. Patients had common symptoms like cough 72%, fever 62%, fever with cough 56%, diarrhoea 26% and 58% patients had additional symptoms sore throat, nasal congestion, fatigue, headache, body ache, vomiting, abdominal pain, 22% patients had respiratory distress. 12% patients associated with had comorbidities. Among those 1 with CKD, 2 TB and 3 patients had asthma and 1 CP child. Total 6 patients were died, 2 patients (2.8%) from positive cases and 4 patients (4.9%) from suspected cases. Among those 1 was CP child. Study showed that 14% patient's had leucopenia, 14% lymphopenia and 52% raised CRP, patients had, 38% patient had neutroenia. There was Serum Ferritin high in only 38% cases. 30% patients had normal Chest X-Ray and bilateral consolidation 12% and 58% patchy opacities. Average total hospital stay of patients was 7-12 days.

DISCUSSION

In this study, more than 84% patients had history of close contact. In Anhui province, China a multi-center retrospective cohort study was done in 33 cases COVID-19 patient which was showed positive family contact or family clustering which were similar to different studies.^{20,9,21,22} A study from Nepal showed 74% household and 26% unknown contact and the study from China showed 66% household and 28.9% endemic area contact.^{23,24} So, it has been shown from different studies

that, many children do not have known contact with a definite COVID 19 case. So avoidance of close contact with strangers should also be strongly recommended. Male: Female ratio in the present study (1.78:1) which is close to the study conducted by Anwar et al. (1.53:1), Ghosh et al. (1.7:1) and Guo et al. (1.2:1)^{25,26,24}. Most of the patients (44%) were older children >10 years with a mean age of 8.6 year which is similar to the study conducted by Anwar et al. where most of the patients were above 11 years.²⁵ But the study conducted by Ghosh et al. reported different findings and most of their cases were between 1 to 2 years.²⁶ A similar retrospective study in Mainland China showed the median age as 7 years which could be due to regional variation. In our observation that fever (62%) and respiratory symptoms (72%) predominated in the symptomatic children.²⁴ Gastrointestinal symptoms (26%) were the next common manifestations. Observational studies across the world have reported similar frequency of symptoms.²⁷⁻³⁰ A systematic review of 27 studies showed fever to be present in half (41%–58%) followed by cough (39%–51%) and rapid breathing (6%–17%). Gastrointestinal symptoms, particularly diarrhea was noted in 6%–13% children.³¹ One cohort study also showed fever (56%) and cough (54%) were the predominant feature³². This study showed 58% patients had additional symptoms sore throat, nasal congestion, fatigue, headache, body ache, vomiting, abdominal pain. In addition to fever and cough many other symptoms were also found in COVID-19 in different studies.³³ 12% patients associated with had comorbidities. Among those 1 with CKD, 2 TB and 3 patients had asthma and 1 CP child. 1 patient needed ventilator support. 2 patients from positive cases and 4 patients from suspected cases were died among those 1 was CP child. Though the severe condition is rarely reported in children compared with adults, life-threatening complications and death associated with COVID-19 disease have also been documented.

Underlying chronic pulmonary disease, cardiovascular disease, immune-suppression, and obesity significantly contributed to the complications.³³ In our study, among 154 suspected population, 52% became RT PCR positive for COVID 19. Few similar studies have been conducted in the country in this regard. The study conducted in Dhaka Medical College Hospital found more than 72% RT PCR for COVID 19 positive pediatric cases among 1403 suspected population, which is similar to our study.³⁴ Another study conducted in two pediatric centers in Dhaka city revealed 30.08% positivity rate among suspected pediatric population.³⁵ Summarized from 12 studies on 66 children that 69.6% had normal leukocytes, 6% neutropenia, 4.6% neutrophilia, 3% lymphopenia and elevated CRP 13.6%.³⁶ Regarding investigation from this study leucopenia, lymphopenia, neutrophilia, raised CRP, increased serum ferritin showed in different percentage. There were 30% patients who had normal Chest X-Ray and 12% had bilateral consolidation and 58% had patchy opacities. Another study showed that among 134 cases, 36% of the patients had pneumonia, 6.7% were normal X-Ray and 64.9% were mild lesion.³⁶

CONCLUSIONS

In the initial phase of the pandemic, most children with COVID-19 had a household contact and presented with fever, cough and diarrhoea. Clinically the symptoms of COVID-19 in children are usually mild in nature. Severe and critical illness was observed in young infants and those with comorbidities. Majority had good outcome with recovery to hospital discharge. Due to mild symptoms or asymptomatic infection children may play a role in transmission of virus to community.

DISCLOSURE

All the authors declared no competing interest.

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