

An Observational Study on Clinical and Epidemiological Profile of Pediatric Patients with Coronavirus Disease 2019 (COVID-19) Presenting With Comorbidities at RIMS, Ranchi

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ABSTRACT

Introduction: SARS COVID-19 infection leads to wide range of symptoms in comorbid pediatric patient. In view of its susceptibility affecting pediatric age groups with comorbidities and its potential to increase the mortality rate, it may have adverse effects on the outcome of such children. This study aims at better understanding of clinical profile and its outcome of pediatric population. **Method:** A total of 50 pediatric patients aged 1 to 17 years with comorbidities and laboratory confirmed COVID-19 that were admitted at the RIMS, Ranchi from 1st April 2020 to 31st December 2020 were studied. **Result:** 34 (68%) resided in the hot spot areas of the region, 8(16%) resided in the non- hot spot areas and 8(16%) had migrated from elsewhere. Higher proportion of males between 11-15 years of age were affected (64%). Our study shows that the majority of the children that were affected were of the age group 11-15 years (52%). 38(76%) of these children presented with fever as their major complaints, cough in 28(56%), sore throat in 2 (4%), diarrhea in 6(12%), vomiting in 11 (22%), breathing difficulty in 20 (50%) and 30 (60%) had other symptoms. Out of 50 patients admitted, 3 died. In our study majority of comorbid condition was thalassemia major. **Conclusion:** The presenting characteristics, comorbidities, and severity of illness of pediatric patients with COVID-19 were different, and milder, compared with adults.

Keywords: Children, clinical profile, COVID-19

Introduction

In December 2019, infection due to severe acute respiratory syndrome coronavirus disease-19 (SARS COVID-19) emerged in city of Wuhan in China and leads to increased morbidity and mortality both in adults and children.^[1-3] A total of 264 million cases are there globally and 5.2 million mortalities were reported

till December 2021.^[4] WHO designates the pandemic caused by SARS COV 2 as coronavirus disease-19 (COVID-19).^[5] In comparison to adults, there are very few studies on pediatric COVID-19. This study will help family care physician to suspect and treat early the COVID-19 infection in pediatric population with comorbidities and understanding the epidemiological and clinical feature will help to control the disease. Whereas, data on pediatric patients suffering with comorbidities affected with COVID-19 and study on its outcomes are lacking. In view of its susceptibility affecting pediatric age groups with comorbidities and its potential to increase the mortality rate, it may have adverse

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effects on the outcome of such children. It is very difficult to diagnose and treat children as they are unable to describe their health status or any exposure history. The child with coexisting disease is more susceptible to COVID infection^{6,7} and its manifestation are varied so it becomes very important to diagnose the COVID-19 infection at early stage. This study aims at better understanding of clinical profile and its outcome of pediatric population with coexisting disease in respect to epidemiology, clinical characteristics, fatality rate, and outcome and admitted at the New Trauma Centre, COVID Ward, Rajendra Institute of Medical Sciences, Ranchi.

Method

A total of 50 pediatric patients aged 1 to 17 years with comorbidities and laboratory confirmed COVID-19 that were admitted at the New Trauma Centre, Corona Isolation Ward, RIMS, Ranchi from 1st April 2020 to 31st December 2020 was studied. The diagnosis of COVID-19 was based on guidelines issued by the Indian Council of Medical Research (ICMR), New Delhi. The proper informed consent was taken from their parents/guardian prior to study. Patients were investigated who had history of close contact to COVID-infected individual or exposure to containment area of COVID and presents with symptoms of fever, cough or any radiographical changes. Confirmation of SARS-COV-2 infection by reverse transcription–polymerase chain reaction (RT-PCR) of samples taken from upper nasopharyngeal swabs. Epidemiological study was based on travel history, close contact with COVID positive cases, and residing in epidemic areas. Progress during hospital stay was recorded and their outcome analyzed. Inclusion criteria included all COVID-19 positive patients aged 1 to 17 years with coexisting disease. The study excluded all COVID-19 negative children, all asymptomatic COVID-19 positive patients, and children less than 1 year and greater than 17 years of age.

Result

During the study period from 1st April 2020 to 31st December 2020, 50 children meeting the inclusion criteria were admitted in the Corona Ward, New Trauma Centre, RIMS, Ranchi, Jharkhand, as per the ICMR guidelines. Out of these children, 34 (68%) resided in the hot spot areas of the region, 8 (16%) resided in the non-hot spot areas, and 8 (16%) had migrated from elsewhere. Majority of these children had a positive history of contact with a COVID-19 positive patient due to the possible family clustering as being a major route of transmission for pediatric age group. Our study shows that the majority of the children that were affected were of the age group 11 to 15 years (52%), with male child being more affected as depicted in Tables 1 and 2, respectively; 38 (76%) of these children presented with fever as their major complaints, cough in 28 (56%), sore throat in 2 (4%), diarrhea in 6 (12%), vomiting in 11 (22%), breathing difficulty in 20 (50%), and 30 (60%) had other symptoms shown in Table 3. The children of this study group included those who were already medically

Table 1: Age group wise distribution of cases of coronavirus disease 2019

Age	Total
1-5 years	6 (12%)
6-10 years	9 (18%)
11-15 years	26 (52%)
>15 years	9 (18%)

Table 2: Gender wise distribution of cases of coronavirus disease 2019

Gender	Total
Male	32 (64%)
Female	18 (36%)
M:F Ratio	16:9

Table 3: Clinical profile of coronavirus disease 2019 in children

Symptoms	No. of patients
Fever	38 (76%)
Cough	28 (56%)
Sore throat	2 (4%)
Diarrhea	6 (12%)
Vomiting	11 (22%)
Breathing difficulty	20 (50%)
Other symptoms	30 (60%)

Table 4: Profile of the comorbidities associated with children with coronavirus disease 2019

Comorbidities	No of patients
Thalassemia Major	8 (16%)
Sickle Cell Disease	2 (4%)
Viral Encephalitis	7 (14%)
Meningitis	3 (6%)
Rheumatic Heart Disease	2 (4%)
Idiopathic Thrombocytopenic Purpura	1 (2%)
Hemophilia A	1 (2%)
Pheochromocytoma	1 (2%)
Pulmonary Tuberculosis	4 (8%)
Hyperactive Airway Disorder	4 (8%)
Meningomyelocele	2 (4%)
Chronic Liver Disease	2 (4%)
Congenital Heart Disease	2 (4%)
SLE	2 (4%)
Nephrotic Syndrome	3 (6%)
Chronic Kidney Disease	1 (2%)
Malaria	1 (2%)
Liver Abscess	1 (2%)
Seizure Disorder	3 (6%)

diagnosed or had a preexisting comorbidity and were tested positive for corona virus disease 2019 by RT-PCR. Table 4 depicts the various comorbidities and preexisting diseases associated in the study sample. The median range of the duration of hospital stay of these children was 12. Out of the

50 children, 3 children had succumbed to the disease and 47 were successfully discharged.

Discussion

Current publication involving children with COVID-19 positive with comorbidities and symptoms, characteristics, and outcomes of these patient is limited. In our study, main clinical feature was fever followed by cough and diarrhea in COVID-infected pediatric population with comorbidities.^[8-10] There is very limited study of pediatric population with COVID infection with preexisting comorbidities, so we have performed study on epidemiological and clinical feature of such patients. This showed that pediatric population with comorbidities were mainly affected by family clustering. The management of COVID positive pediatric patients are mainly symptomatic and treatment of comorbidities also.

Children with COVID infection acquire the infection by exposure to close contacts. They tend to have milder disease manifestations and lower mortality compared with adults (Chan *et al.*, 2020).^[11] Since COVID-19 mainly affects the respiratory tract, this complication is to be expected as our study also showed cough and sore throat as major clinical symptoms (De Luna *et al.*, 2020).^[12] This study shows that majority of patient were male as may be due to biological difference in immune system among male and female.^[13-16]

The presenting clinical symptoms of pediatric COVID-19 were often atypical. The main clinical feature was fever, cough, and breathing difficulty with gastrointestinal symptoms like vomiting and diarrhea. The symptoms were mild to moderate and very few cases needed intensive care unit (ICU) admission.

Children with comorbidities are more susceptible to serious complication of COVID-19 disease. In our study, maximum number of patients were of thalassemia major followed by sickle cell disease and viral encephalitis. Out of 50 patients admitted, 3 died, so this study helps us to suspect and treat early COVID infection with comorbid condition in children which will be is of much help to family care physician. And this study also shows that comorbid condition associated with COVID infection involve all the systems not necessarily respiratory or cardiac.

Average length of stay of COVID positive patients were of 12 days as compared with 19 days in adults.

Conclusion

In summary, the presenting characteristics, comorbidities, and severity of illness of pediatric patients with COVID-19 were different, and milder, compared with adults. All ages of children can potentially transmit SARS-CoV-2, but children are less likely than adults to be symptomatic and are more susceptible to coinfection, which make diagnosis and infection source control more challenging if superadded with preexisting comorbidities. Comorbid conditions affect immune system, respiratory, and

cardiovascular system of child, so they are more susceptible to infection of COVID. Comorbid condition associated with COVID infection involves all the systems not necessarily respiratory or cardiac. We should suspect COVID infection in any children with any comorbid condition presenting with many varied symptoms so as to diagnose and treat it early, thereby preventing morbidity and mortality. We should be cautious about COVID-19 in children with comorbid condition as some of the patients may develop serious complications.

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Conflicts of interest

There are no conflicts of interest.

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