

Clinical Presentation and Outcome of COVID-19 in Children: A Case Series

RITESH KUMAR AGRAWAL¹, MEENAKSHI PANDEY², ASHOK SINGH³, NIRALI SANGHVI⁴, KUSUMLATA YADAV⁵



ABSTRACT

The novel Coronavirus Disease 2019 (COVID-19) is an illness caused by Severe Acute Respiratory Syndrome 2 (SARS-CoV-2), which affects children as well as adults. This case series pertains an observation on six patients, aged 10-17 years, who were admitted to the hospital and found to be COVID-19 positive on testing. All patients had history of contact with COVID-19 positive confirmed family members. Most common symptoms were fever (n=4), cough (n=2) and breathlessness (n=2). No patient had any pre-existing co-morbidity. Raised levels of C-Reactive Protein (CRP) and D-dimer were present in 4 (66.6%) patients each and elevated serum ferritin levels were seen in 3 (50%) patients. Peribronchial cuffing was seen in chest X-ray of one patient. Supportive therapy along with antibiotics (azithromycin and doxycycline) was given to all children. Mean duration of hospital stay was 7.5 days. No patient required intensive care support. All patients recovered at discharge.

Keywords: Clinical features, Coronavirus disease 2019, Paediatric patient, Pandemic

INTRODUCTION

Multiple studies have suggested that children and young adults have milder form of the COVID-19 as compared to adults [1,2]. The clinical findings in children with COVID-19 are diverse; but fever with or without chills and cough are the most common reported symptoms [3,4]. Although severe cases of COVID-19 in children including hypotension and multisystem involvements and fatal cases have been reported, majority of the paediatric cases recover within one to two weeks of disease onset [4,5]. The recording of clinical profile and treatment outcome in pandemic is required. This may help in early recognition, appropriate and effective management of this new disease entity. Therefore, the present case series pertains to clinical profile and outcome of children, who presented at a tertiary-care centre of a teaching hospital.

CASE SERIES

There were six cases of COVID-19, aged 10-17 years, who were admitted to a tertiary care centre of a teaching hospital during the period of July to November, 2020. There were three males and three females. Baseline characteristics of patients at admission are presented in [Table/Fig-1]. All children had at least one family member infected with COVID-19. Categorisation of COVID-19 disease in to mild, moderate and severe was done as per Ministry of Health and Family welfare, Government of India [6]. The patients

Parameters	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6
Age (Years)	14	10	13	14	11	17
Gender	Male	Male	Male	Female	Female	Female
Contact history with positive family members	Yes	Yes	Yes	Yes	Yes	Yes
Fever	Yes	No	Yes	Yes	Yes	No
Cough	No	No	No	Yes	Yes	No
Breathlessness	Yes	No	No	Yes	No	No
Sore throat	No	No	No	Yes	No	No
Anosmia	No	No	Yes	No	No	No
Diarrhoea	No	No	No	No	No	No
Rash	No	No	No	No	No	No

[Table/Fig-1]: Baseline characteristics of patients.

were tested for COVID-19 by quantitative real-time Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) method using nasopharyngeal swab.

Investigations and treatment profile of patients are shown in [Table/Fig-2]. Elevated CRP and D-dimer levels were detected in four patients (66.6%) each, and elevated serum ferritin levels were seen in three (50%) patients. Microcytic hypochromic red blood cells were seen in the blood picture of one child.

Treatment in the form of azithromycin (10 mg/kg/day) and doxycycline (2 mg/kg/day) were given to all patients, while ivermectin (0.2 mg/kg) was given to three patients, each for five days. Prophylactic Enoxaparin (1 mg/kg/day) subcutaneously was given to three patients, one patient needed oxygen therapy at the rate of 2 L/min for 48 hours. None of the cases required Intensive Care Unit (ICU) admission. All children were discharged from the hospital with stable general and medical condition. Mean duration of hospital stay was 7.5 days (range 6-9 days).

DISCUSSION

All six patients in this case series had contact with COVID-19 positive family members, which suggests that family-clustered onset of infection is common in paediatric age group. In this series, fever (66.6%), cough (33.3%) and breathlessness (33.3%) were the predominant symptoms, consistent with the adult patient's symptomatology [7-9]. In paediatric COVID-19 patients, Serrano O et al., reported fever in 43.5%, cough in 34.1% and difficulty in respiration in 15.9% of cases, which is similar to the observation of the present case series [10]. Another systematic review by Patel NA found cough (48%), fever (47%) and sore throat/pharyngitis (28.6%) as predominant symptoms in their reports [11]. In addition, upper respiratory symptoms/rhinorrhoea/sneezing/nasal congestion (13.7%), vomiting/nausea (7.8%) and diarrhoea (10.1%) were the other symptoms.

A meta-analysis done by Irfan O et al., which included 8455 children, showed that 13.1% cases were asymptomatic and 57.4% of patients needed hospitalisation [3]. The most common presenting symptoms were fever (63.3%), cough (33.7%), nausea/vomiting (20.0%) and diarrhoea (19.6%). Other symptoms reported were dyspnoea, nasal symptoms, and rashes, Kawasaki like presentation, conjunctivitis, fatigue, abdominal pain and neurological features. The analysis also showed that 1359 patients were admitted in ICU, of which no death was reported in children categorised as non

Laboratory investigations	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6
Haemoglobin (g/dL)	13.5	13.0	13.9	12.3	12.6	11.8
Total leukocyte counts ($10^3/\text{mm}^3$)	10.9	10.4	5.0	5.9	5.8	6.2
Platelet Counts ($10^3/\text{mm}^3$)	249	240	304	162	219	183
Neutrophil/lymphocyte Ratio	1.36	2.6	1.39	1.79	1.15	1.14
SGOT (U/L)	24	27	34	21	24	26
SGPT (U/L)	19	26	35	16	26	18
Urea (mg/dL)	30	21	14	-	18	17
Creatinine (mg/dL)	0.9	0.7	0.6	-	0.4	0.8
Prothrombin Ratio	-	1.5	-	1.14	1.28	-
Internationalised normalised ratio	-	1.56	-	1.11	1.33	-
CRP (mg/dL)	40.4	18.4	8.7	6.9	-	10.2
D-Dimer ($\mu\text{g FEU/mL}$)	0.74	0.548	0.29	0.511	0.772	0.64
Serum ferritin (ng/mL) (12-140)	791.1	31.77	139.9	1210.2	493.9	36.5
X-ray chest	Within normal limits	Within normal limits	Within normal limits	Bilateral Peribronchial cuffing seen with heterogenous opacity in left perihilar region	-	Within normal limit
High-Resolution Computed Tomography (HRCT) chest	No obvious abnormality	No obvious abnormality	Not done	Not done	Not done	Not done
Treatment	Supportive care, Azithromycin, Enoxaparin, Doxycycline and Ivermectin	Supportive Care, Azithromycin, Doxycycline, Ivermectin, Inj. Vitamin K 10 mg, Enoxaparin	Supportive care, Azithromycin, Doxycycline, Ivermectin	Supportive Care, Azithromycin, Enoxaparin Doxycycline and oxygen therapy (2 litres/min oxygen for 24 hours)	Supportive Care, Azithromycin and Doxycycline	Supportive Care, Azithromycin and Doxycycline
SpO ₂ at admission	94	96	97	93	97	98
SpO ₂ at discharge	98	97	97	98	98	97
Duration of hospital stay	7 days	8 days	8 days	9 days	7 days	6 days
Outcome	Recovered	Recovered	Recovered	Recovered	Recovered	Recovered

[Table/Fig-2]: Investigations and outcome of COVID-19 patients.

severe and 44 deaths were observed in severe cases. This study suggested that children predominantly contract mild form of illness but could be at risk of severe illness which can lead to mortality. Other studies also observed milder form of COVID-19 presentation in children; which is in accordance with our case series [12,13]. In the present study, fever resolved within 3-4 days of treatment. Mean duration of hospital stay was 7.5 days; while other authors reported length of hospital stay ranging between 11.6 to 13.6 days [11,13].

Elevated CRP and D-dimer levels were detected in four patients (66.6%) each, and serum ferritin in three patients (50%). These findings were consistent with the observations of Irfan O et al., who showed raised CRP in 54.2% to 66.3%, D-dimer in 35.2% to 51.0% and serum ferritin in 46.7% to 61.7% of their cases [3]. Thus, raised inflammatory markers are also found in paediatric COVID-19 patients. However, three children needed anticoagulation in the form of Enoxaparin while one required oxygen support. It was reported in previous studies that ICU admission of adult patients ranged from 22% to 27.4% and the mortality rate was between 20% to 62% [14-17]. Unlike adult population, only few children infected with COVID-19 required ventilatory support [16,18]. It may be because of the fact that children have less co-morbidity like diabetes mellitus, hypertension than adult population.

Recommended therapy with azithromycin and doxycycline were given to all patients, and no child was given corticosteroid. As per Ministry of Health and Family Welfare, Government of India guidelines, mild cases do not require any steroid therapy [6]. As regard to radiological features, peribronchial cuffing was observed in chest X-ray. Similar results were found in a study done by Serrano O et al., [10]. Authors studied 44 paediatric COVID-19 patients. About 90% of the chest X-ray showed abnormalities, peribronchial cuffing being the most common (86.3%) followed by ground glass opacities (50%). Consolidation was found in 18.1% of cases. Normal chest X-ray, pleural effusion, altered cardiomeastinal contour were

least common features observed [19]. However, study done by Irfan O et al., reported ground glass opacities as the most common radiological abnormality (27.4%) [3]. At the early stage of disease, radiographic evidence of pneumonia is characteristic of COVID-19 disease. Therefore, close monitoring of COVID-19 infected asymptomatic children or children with mild symptoms is required.

Unlike adults, incidence of COVID-19 associated myocarditis or any other myocardial injury among children is very low [19,20]. In the present series, it was observed that disease was mild in nature. But there were only six patients, so the findings cannot be generalised. Therefore, it appears that observation on a larger number of children with COVID-19 positivity is required in order to find out their exact clinical presentation and outcome especially in hospitalised children. Further, detailed investigations such as markers of inflammatory response (CRP, serum ferritin, Lactate dehydrogenase, Interleukin-6 and D- dimer) may be needed in children who present with moderate or severe disease.

CONCLUSION(S)

Children presenting with fever, cough and breathlessness should be suspected for COVID-19 infection during the period of ongoing pandemic and considered for testing of Coronavirus infection with RT-PCR. Radiographic evidence of pneumonia should also be observed. Supportive care leads to adequate recovery. As such children are less prone to develop moderate/ severe form of the disease than adults due to lesser incidence of co-morbidities and better recovery rate. But due to emergence of multiple variants currently, we need to be vigilant about the effects and pathogenesis of these variants, its clinical course and outcome in paediatric patients.

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PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Paediatrics, Heritage Institute of Medical Sciences, Varanasi, Uttar Pradesh, India.
2. Assistant Professor, Department of Paediatrics, Heritage Institute of Medical Sciences, Varanasi, Uttar Pradesh, India.
3. Assistant Professor, Department of Paediatrics, Heritage Institute of Medical Sciences, Varanasi, Uttar Pradesh, India.
4. Assistant Professor, Department of Paediatrics, Heritage Institute of Medical Sciences, Varanasi, Uttar Pradesh, India.
5. Postgraduate Trainee, Department of Paediatrics, Heritage Institute of Medical Sciences, Varanasi, Uttar Pradesh, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Nirali Sanghvi,
703, NTS Flats, Hims Campus, Bhadwar, Varanasi, Uttar Pradesh, India.
E-mail: dniralis@yahoo.co.in

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