

A Case Series of the Spectrum of Severe SARS CoV Infection in Hospitalized Children in a Tertiary Care

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ABSTRACT

We describe 6 children of severe COVID-19 infection of age group 2 months to 14 years admitted to a large tertiary care medical college hospital in Jabalpur (MP). All 6 patients presented with fever, lymphopenia, and granulocytosis, high levels of inflammatory markers on laboratory evaluation. Three of the 6 patients were found to have positive antibody titers and negative RT-PCR values in which 1 presented with Kawasaki like illness and 2nd one presented with encephalitis. Two had known exposures to close contacts. In this case series, we describe 6 patients to be reported with severe acute respiratory syndrome corona virus 2 in the tertiary care government medical college and hospital.

Keywords: COVID-19, children, clinical features

CASE 1

A 9 year-old boy presented with 8 days of fever, headache, and 1 day of shortness of breath. The patient was febrile (103F), tachycardia (120 beats/min), normotensive (120/65 mm Hg), and tachypneic (46 breaths/min). His oxygen saturation was 80% on RA and 94% on oxygen via NIV. On respiratory system examination he had marked sub costal and intercostals retractions and B/L basal crepitations on auscultation and other system examination did not reveal any abnormality. RT-PCR for COVID 19 was positive on day 2 of hospitalization.

Laboratory analysis revealed neutrophil predominance (80%) with normal leucocytes and platelet counts and significant elevation of inflammatory markers, including C-reactive protein, lactate dehydrogenase, ferritin and D-dimer however High-sensitivity troponin T (hsTnT) levels were normal. CT scan showed a bilateral basal opacity with no cardiomegaly.

The patient was put on Non invasive ventilation for severe Respiratory distress, i/v antibiotics, i/v Remdesivir @ 5mg/kg followed by 2.5mg/kg/day, i/v ionotropes, intravenous immunoglobulin (2gm /kg via infusion), inj remdesivir (5mg/kg followed by 2.5mg/kg/day), inj enoxaparin (0.5mg /kg /SC) and intravenous methyl prednisolone (2mg/kg) along with other supportive medications.

On day 3, he was weaned from Non invasive ventilation and was kept on oxygen via nasal prongs and inflammatory markers levels declined. The patient was discharged after 11 days.

CASE 2

A 12 year-old girl presented with 5 days of high grade fever, difficulty in deglutition with no cough and rhinorrhoea since 4 days, Myalgia and arthralgia since 4 days, rashes on both palms and abdominal pain in right hypochondrium since 4 days No history of contact with COVID patients in family or neighborhood. Upon

examination, the patient was febrile, tachycardic (130 beats/min), hypotensive (80/44 mm Hg). His oxygen saturation was 96% at RA. On General examination child was sick looking B/L conjunctival congestion was present palmar erythema present and unilateral cervical lymphadenopathy was also present. On laboratory tests complete blood analysis showed neutrophil predominance N/L ratio >3.3 (N 80%, L18%) and significant elevation of inflammatory markers (Ferritin 1036 ng/ml, NT pro BNP >35,000, LDH 373 IU/L, d-Dimer 2000, PCT 71.29) hsTnT levels were normal (0.01 ng/L).

Dengue kit test was negative and ASO titer was also normal, COVID antibody test was positive for total antibodies and rt PCR for COVID was negative therefore diagnosis of Multisystem inflammatory syndrome-Children (Kawasaki Like illness) was made. Patient was started on mechanical ventilation in view of refractory shock with FiO₂ 60% PiP 12/PEEP 7 rate 30, she was treated with I/V broad spectrum antibiotics in view of high PCT, methylprednisolone @30mg/kg/day and intravenous immunoglobulin @2gm/kg and an epinephrine infusion for hypotension.

Mechanical ventilation weaned off gradually with improving vitals, inotropic support was weaned by 36-48 hours. By PICU day 3, inflammatory markers were trending downward. She was discharged in stable condition after 10 days of hospitalization

CASE 3

3 months old girl child whose parents tested positive for COVID 19 infection was admitted for fever, vomiting and decreases oral acceptance since last 2 days .At admission baby was sick looking tachycardic with SpO₂ 96 at RA and no significant finding on systemic examination. Baby was admitted as COVID suspect with? Septicemia baby was started on antibiotics along with other supportive medications. Laboratory findings revealed normal

leucocytes count, normal ratio of Neutrophils to lymphocytes ,normal platelet counts ,inflammatory markers were elevated (CRP was 83 and ESR was 70) ,chest X ray was normal RT PCR for COVID was negative and COVID antibody test was positive therefore diagnosis of MIS-C was made . Baby had persistent fever, an episode of malena, persistent tachycardia and hypotension therefore the baby was put on mechanical ventilation with FiO₂ 60% PiP 12/PEEP 5 rate 40 , I/V methylprednisolone @ 30mg/kg/day and IVIG @ 2gm/kg were given along with other medication including inotropic support however she did not respond to the treatment given and had refractory shock and bleeding from various sites and died on day 3 of hospitalization.

CASE 4

A 3 year-old girl presented with 3 days of fever, cough, and 2 days of shortness of breath. The patient was febrile (103F), tachycardia (120 beats/min), normotensive (120/65 mm Hg), and tachypneic (46 breaths/min). His oxygen saturation was 80% on RA and 94% on oxygen via NIV. On respiratory system examination he had marked sub costal and intercostals retractions and B/L basal crepitations on auscultation and other system examination did not reveal any abnormality. child was admitted in COVID isolation PICU where his RT-PCR test for COVID showed positive results. The patient was put on Non invasive ventilation for severe Respiratory distress, i/v antibiotics, i/v ionotropes, intravenous methyl prednisolone (2mg /kg) along with other supportive medications.

Laboratory analysis revealed neutrophil predominance (80%) with normal leucocytes, platelet counts and inflammatory markers, including C-reactive protein, Chest x ray was normal.

On day 3, he was weaned from Non invasive ventilation and was kept on oxygen via nasal prongs and inflammatory markers levels declined. The patient was discharged after 11 days.

CASE 5

A 40 days old male baby presented with 3 days of fever and generalized seizure since 1 day. On examination, generalized seizures was present, temp was 100 F, tachycardia was present (170 beats/min), normotensive, and tachypneic (46 breaths/min). His oxygen saturation was 94% on oxygen. COVID RT PCR was positive for baby and mother both and they belonged to containment zone. Laboratory reports revealed normal leucocytes, platelet counts and inflammatory markers; CSF analysis showed no cellular elements. Chest X ray showed normal findings. In view of above finding diagnosis of septicemia was made and the baby was started on oxygen via nasal prongs, i/v antiepileptic i/v antibiotics along with other supportive medications.

He responded to the treatment given, seizure subsided and oxygen weaned off gradually and child was taken on breastfeeding which he tolerated well and discharged after 14 days in stable condition.

CASE 6

A 13 year-old boy presented with 7 days of high grade fever, headache and vomiting since 8 days and an episode abnormal movement of all 4 limbs with an up rolling of eyeball just a day before admission followed by weakness of left half of body and altered level of consciousness. No history of contact with COVID patients in family or neighborhood. On examination, the patient was febrile, tachycardic (130 beats/min), hypotensive (80/50 mm Hg). His oxygen saturation was 92-92 % at RA. On General examination child was sick looking B/L conjunctival congestion was present, Laboratory tests revealed High leucocytes counts of 42500 with neutrophil predominance N/L ratio >3.3 (N 80%, L18%) and significant elevation of inflammatory markers (CRP 45, Ferritin 936 ng/ml, LDH 473 IU/L, d-Dimer 2000)

Patient was started on mechanical ventilation in view of refractory shock and respiratory failure with FiO₂ 60% PIP

12/PEEP 7 rate 30, she was treated with I/V broad spectrum antibiotics in view of high PCT, methylprednisolone @30mg/kg/day and intravenous immunoglobulin @2gm/kg and an epinephrine infusion for hypotension.

DISCUSSION

This is the case series report on 2019-nCoV infection in children. Our preliminary clinical findings showed that children with COVID usually presented with mild respiratory infections, as compared with adult cases [1]. A few of the patients presenting with/without cough also showed radiographic evidence of patchy infiltrate at symptom onset. In one study of a family cluster, an asymptomatic 10-year-old child infected with 2019-nCoV due to household exposure had radiological ground-glass lung opacities [2]. We have seen 4 out of six children presented with non respiratory complaint and three of them who were antibody positive and PCR negative had multisystem inflammatory disease with very high levels of inflammatory markers. Two out of three responded to methyl prednisolone well and discharged successfully after 14 days of hospitalization.

We do not recommend use of antiviral agents for the treatment of self-limited non severe COVID because no evidence has shown the effectiveness of antiviral agents currently available. Empirical antibiotic initiation is not recommended for treatment of non severe 2019-nCoV-associated pneumonia without evidence of bacterial infection [3].

To summarize our case series we would like to put a remark that the Children are also susceptible to 2019-nCoV and mild or atypical cases were largely under diagnosed according to the initial screening criteria, which focused on suspected pneumonia cases. Severe COVID 19 infection and post COVID illnesses like MIS-C, Kawasaki like illness etc are seen uncommonly but can cause life threatening

illness therefore needs to be addressed and taken care of well at an early stage.

The COVID epidemic is now spreading globally. Further research and

surveillance are crucial to help us understand the clinical characteristics and natural history of 2019-nCoV infection in children.

Table 1: Summary of clinical findings

History /examination	Case 1	Case 2	Case3	Case 4	Case 5	Case 6
Age /sex	9 years/M	13years/F	3months/F	3 years/F	40days/M	13years/M
Exposure known/unknown	Known (father)	unknown	Known (Parents)	Unknown	Unknown	unknown
Fever	Yes	Yes	Yes	Yes	Yes	Yes
Vomiting	Yes	Yes	Yes	No	yes	Yes
Headache	No	Yes	No	No	No	Yes
Seizures	Yes	Yes	Yes	No	Yes	Yes
Cough	Yes	No	No	Yes	Yes	yes
Provisional diagnosis	SARI	Kawasaki Like illness	Severe sepsis	SARI	Septicemia	Encephalitis

SARI- severe acute respiratory illness

Table 2: Laboratory findings of all sick patients with COVID 19

Laboratory Findings	Case 1	Case 2	Case3	Case 4	Case 5	Case 6
Age/Sex	9 years/M	13years/F	2months/F	3 years/F	40days/M	13years/M
Total leucocyte count(4000-11000)	6300	42400	10000	13800	10900	41000
Platelet counts(1.5-4.5lacs)	7.6	4.3	4.13	3.2	2.4	51000
N/L ratio >3.3	>3.3	>3.3	<3.3	>3.3	>3.3	>3.3
CRP (mg/l)	35.8	35	83	20	12	43
Ferritin (ng/ml)	1089	989	353.20	353	Not sent	1036
LDH (IU/L)	203	350	342	342	Not sent	373
PCT (ng/ml)	0.025	0.02	0.10	20	Not sent	71.2
D dimer(<800ng/ml)	1281-24	1000	965	1065	Not sent	2000 .4
Troponin I(.00-0.01)	0.01	0.02	0.01	0.02	Not sent	0.01
Throat Swab for PCR RT PCR	Positive	Negative	Negative	Positive	Positive	Negative
COVID antibody	Negative	Positive	Positive	Negative	negative	Positive

Abbreviation: N/L (Neutrophil/lymphocyte ratio), CRP- C- reactive protein, LDH- lactate dehydrogenase, PCT- procalcitonin/nCoV, novel corona virus. SARI- severe acute respiratory illness

Table 3: Treatment given and outcome of severe Covid infection in children

Age/Sex	Remdesivir	Co-morbidities	Steroid	Enoxaperin	Mechanical ventilation	Duration of treatment	Outcome
13years /F	No	N0	Yes	No	Yes	10days	Discharged
3 years /F	No	Yes	Yes	No	Yes	10days	Discharged
40days /M	No	Yes	Yes	No	No	14days	Discharged
2months/F	Yes	No	Yes	N0	Yes	46hours	Death
3mnth /F	No	Yes	Yes	No	Yes	12 hours	Death
2month /F	No	Yes	Yes	No	Yes	12 hours	Death
9years/M	Yes	No	Yes	Yes	Yes	11 days	Discharged
13years/M	No	Yes	Yes	No	Yes	7days	Admitted

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