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UNUSUAL PRESENTATION SARS-COV-2 RELATED MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN

Pediatrics

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ABSTRACT

Multi system inflammatory syndrome in children (MIS-C) is a rare, but life-threatening complication of SARS-CoV-2 infection. During the second wave of COVID-19 in India and other countries, the impact of the disease among children, initially considered less important,[1] will increasingly be more relevant. The role of children in viral transmission and its impact in epidemic expansion, as well as the extent of the diversity of clinical presentation, are still unclear. In children, around the globe, various cases of a new clinical picture manifesting as a hyper-inflammatory syndrome, with multi-organ involvement similar to Kawasaki Disease and with potential evolution to a shock syndrome. This represented a new phenomenon affecting previously asymptomatic children with SARS-CoV-2 infection.[2] Herein we report a case of SARS-CoV-2 related MIS-C.

KEYWORDS

CASE REPORT

A previously healthy, 8 years old boy, presented (on 8th May, 2021) with case of Acute Abdomen, with history of fever, intermittent, 105 °F maximum for 8 days, not responding to antipyretics and pain abdomen for 3 days with tenderness at right iliac fossa region with no history of vomiting or loose stools or constipation, referred to tertiary health care centre as acute abdomen with a suspicion of acute appendicitis. His reports done before admission at local hospital showed Covid 19 RTPCR negative with slightly increased CRP and ESR with a TLC of 4200/microliter with 91% neutrophil. Platelet were within normal limits and USG abdomen was suggestive of Intussusception.

He was brought to our hospital with above mentioned complaints and admitted for the same under Gastrointestinal surgery department and empirical antibiotics were started. CECT chest and abdomen done at Eternal hospital, Jaipur showed -Mild hepatosplenomegaly, Mesenteric lymphadenopathy (Largest 1.7 X 1.2 cm and 1.8 X 1.2 cm) and no evidence of appendicitis, intussusception or any other intra-abdominal surgical problem. Hence child was referred and shifted to Pediatric medicine department for further evaluation. On day 2nd of admission child developed cracked lips, maculo- erythematous rashes all over body including sole and palms with swellings over tips. He also developed non-purulent conjunctivitis and sterile pyuria. No obvious cause of fever was evident in the child at that time and provisional differential diagnosis of Kawasaki disease & SARS-CoV-2 related Multisystem Inflammatory Syndrome in the Child was made and relevant investigations along with blood culture and urine culture were sent. Opinion from Cardiologist was sought & 2D Echo of heart was done which showed normal coronaries with a LVEF of 60%. The investigations (table 1) showed, IL-6- 638.1, D-Dimer-2790, CRP-303.76, ESR- 49, Ferritin- 586, Procalcitonin- 9.65 and LDH-998, PT-INR-1.3 &Widal test was negative. He was diagnosed as a case of MIS-C. Pulse therapy of Methylprednisolone at 30 mg per kg per day (for 5 days) was started along with IV antibiotics and prophylactic fluconazole to avoid secondary fungal infection.

It fulfilled the clinical criteria for Covid related MIS-C syndrome by CDC and WHO (3)

1) Fever 8 days ,
2) with Rashes all over body with palms and soles, non-purulent conjunctivitis
3) Multisystem Involvement (Skin, GI, Heart, Blood, kidney & Lungs)
4) Raised inflammatory markers (ESR, CRP, D-Dimers, Ferritin, Pro-calcitonin)
5) Deranged coagulation profile (deranged PTINR)
6) H/O Fever in all family members 1 month ago (suspected COVID)
7) No Obvious other cause of fever or the illness- Blood culture sterile, urine culture- sterile. WIDAL & MP Antigen - Negative

On day 3 he developed sudden onset breathlessness with tachypnoea, tachycardia and pallor. His SPO2 was 85% and BP was 94/70 so he was put on oxygen therapy and shifted to ICU. Chest Xray was suggestive of pulmonary edema and furosemide was added to the treatment. A repeat 2D-echo was done, seeing to the clinical worsening of the child, which showed LVEF 45 % (which was 60% on day 2) indicating left ventricle dysfunction, therefore Dobutamine was added for improving left ventricle function and **IVIg** at 2gm/ kg given over 3 days, considering the diagnosis of MIS-C. He was started on BIPAP (non-invasive ventilation) to improve his oxygen saturation and reduce work of breathing. Antibiotics were empirically upgraded as per the clinical condition of the child. By this time his blood culture and urine culture report were received and showed no microbial growth. Gradually, over next few days, child improved with the given treatment and the inflammatory markers reduced. Respiratory support was gradually weaned off. At the time of discharge (after 11 days), he was walking well, eating well, afebrile for last 7 days, no other clinical symptoms and signs and all the inflammatory markers reduced except D-Dimer which though reduced much (2790 to 1110) was still mildly raised. On Follow up his D-dimers became normal after 3 days of discharge.

Table 1 -INVESTIGATIONS

S. No.	Investigations	07-May	08-May	09-May	10-May	11-May	12-May	15-May	17-May
I	CBC								
	Hb	10.2	9.7	9.8	10	9.4	10.3	9.6	
	HCT	31.5	29.3	29.3	30.1	29.4	31.9	28	
	WBC	5.38	8.6	13.31	12.78	11.74	14.52	9.36	
	Neut	89.3	93.4	89.7	85.6	85.7	77	66.4	
	Lympho	5.9	4.5	9.1	13.1	13	20.4	29.2	
	PLT	2.07	2.61	3.25	3.79	3.43	3.45	4.31	
II	CRP			66.61			37.09	9.1	
III	ESR		49	38			34	41	

III	D-DIMER		2700		900.59		1050.24	1121	1110
IV	IL-6		638.1				3.78		
V	FERRITIN		586				948	713.9	
VI	PROCALCITONIN		9.65	12.67					0.12
VII	PT		17.6		14.4				
	INR		1.3		1.3				
	APTT		37.8		33.7				
VIII	NTPRO BNP				**7385**				229
IX	URINE ROUTINE	WITHIN NORMAL LIMITS							
X	URINE CULTURE	Sterile							
XI	BLOOD CULTURE	2 blood cultures sterile							
XII	CECT ABDOMEN	Mild hepatosplenomegaly, Mesentric lymphadenopathy (Largest 1.7 X 1.2 cm and 1.8 X 1.2 cm.)							
XIII	HRCT CHEST	Within normal limits							
XIV	CHEST XRAY								
XV	COVID RT PCR	Negative		Negative					

In this case the child presented with Acute abdomen which unusual for COVID related MIS-C which differs from usual presentation as described by Jain et al.

This child recovered with only supportive care, no longer requiring intensive care after a few days and showing complete recovery. Although a severe illness, with 68% requiring intensive care (5), few deaths have been reported in other countries, often resulting from complications related to therapeutic intervention.[5] This is an important point to be observed when exploratory therapy is considered. Children have been treated with anti-inflammatory treatment, including parenteral immunoglobulin and steroids (7,8) and a few received TNF-alfa inhibitors, IL-1 and Il-6 receptor antagonists (5). However, a better understanding of the pathogenic mechanism of the disease may help defining the appropriate interventions for specific cases. Although some authors have described MIS-C as a type of cytokine storm, important differences from the prototype antibody chimeric reactions, observed with some monoclonal therapeutic agents, have been highlighted (8) and different immunopathogenic mechanisms may be expected. Moreover, high serum IL-6 is also common in some systemic juvenile arthritis (6) and the role of cytokines and other features of MIS-C still lack proper understanding to guide therapy. There is also an urgent need to standardize data describing exact etiology, pathophysiology, clinical presentations, severity, outcomes and epidemiology of MIS-C (9).

Clinical features suggestive of this syndrome should prompt alertness among primary care, emergency units and pediatricians during the expected expansion of COVID-19 in India and in other countries. Diagnosing this syndrome early and treating it promptly with IVIg give a very positive response, and morbidity and mortality can be minimised.

REFERENCES

1. Ludvigsson J.F. Systematic review of COVID-19 in children shows milder cases and a better prognosis than adults. *Acta Paediatr.* 2020;109:1088–1095. [PMC free article] [PubMed] [Google Scholar]
2. Riphagen S., Gomez X., Gonzalez-Martinez C., Wilkinson N., Theocharis P. Hyperinflammatory shock in children during COVID-19 pandemic. *Lancet*. 2020;395:1607–1608. [PMC free article] [PubMed] [Google Scholar]
3. Information for Healthcare Providers about Multisystem Inflammatory Syndrome in Children (MIS-C)- https://www.cdc.gov/mis-c/hcp/#:~:text=An%20individual%20aged%20%3C21%20years,dermatologic%20or%20neurological)%3B%20AND
4. Jain S, Sen S, Lakshmivenkateshiah S, Bobhate P, Venkatesh S, Udani S, Shobhavat L, Andankar P, Karande T, Kulkarni S. Multisystem Inflammatory Syndrome in Children With COVID-19 in Mumbai, India. Indian Pediatr. 2020 Nov 15;57(11):1015-1019. doi: 10.1007/s13312-020-2026-0. Epub 2020 Aug 11. PMID: 32788432; PMCID: PMC7678602.
5. Radia T., Williams N., Agrawal P. Multi-system inflammatory syndrome in children & adolescents (MIS-C): a systematic review of clinical features and presentation. *Paediatr Respir Rev.* 2020 doi: 10.1016/j.prrv.2020.08.001. Aug 11:S1526-0542(20)30117-2. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
6. Rowley A.H. Understanding SARS-CoV-2-related multisystem inflammatory syndrome in children. *Nat Rev Immunol.* 2020:1–2. [PMC free article] [PubMed] [Google Scholar]
7. Ministério da Saúde . vol. 51. 2020. (Boletim Epidemiológico). No. 35. https://www.saude.gov.br/images/pdf/2020/September/04/Boletim-epidemiologico-SVS-35-editado.pdf. [Accessed 7 September 2020] [Google Scholar]
8. Vardhana S.A., Wolchok J.D. The many faces of the anti-COVID immune response. *J Exp Med.* 2020;217 [PMC free article] [PubMed] [Google Scholar]
9. WHO Multisystem inflammatory syndrome in children and adolescents temporally related to COVID-19. 2020. https://www.who.int/news-room/commentaries/detail/multisystem-inflammatory-syndrome-in-children-and-adolescents-with-covid-19 .