

Case Report

Child with post COVID MISC presenting with atypical Kawasaki like features in a rural medical college

Poovendhan Ravivarma, Vimalraj Vijayakumar, Ramanathan*

Department of Pediatrics, Raja Muthiah Medical College Hospital, Chidambaram, Tamil Nadu, India

Received: 16 November 2020

Accepted: 07 January 2021

***Correspondence:**

Dr. Ramanathan,

E-mail: drram78@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

COVID-19 in pediatric population is often milder but a segment of cases tend to worsen out and present with pediatric multi system inflammatory syndrome. Here we present a 3 year-old female child presenting with acute febrile illness, generalized rashes with loose stools. On examination child was in fluid refractory shock requiring vasoactives, oxygen by non-rebreather mask, antibiotics and other supportive. Investigations revealed neutrophilic leukocytosis, with normal absolute lymphocyte count, thrombocytopenia and elevated inflammatory markers with negative COVID real time-polymerase chain reaction (RT PCR) and positive COVID immunoglobulin G (IgG) antibody, suggesting a post COVID-19 sequelae. Children presenting with multisystem inflammatory syndrome in children (MIS-C) most often have a silent course of acute COVID infection. Lymphopenia and thrombocytosis are not always associated with MIS-C. COVID antibody with inflammatory markers like C-reactive protein (CRP), D-dimer plays an important role in the management and during follow up. More pediatric studies are needed regarding the role of aspirin in MIS-C with Kawasaki disease overlap, choice of anticoagulant in a thrombocytopenic child and any markers which could predict the development of MIS-C during acute COVID infection.

Keywords: MISC, Post COVID, COVID in children, Kawasaki like illness

INTRODUCTION

When compared to the higher mortality rates in adults and severity of morbidities, the disease manifestation of COVID-19 in pediatric population is often milder. But, a segment of cases tend to worsen out and present with pediatric multi system inflammatory syndrome which is similar to other pediatric inflammatory conditions like Kawasaki shock syndrome, toxic shock syndrome, Hemophagocytic lymphohistiocytosis (HLH)/macrophage activation syndrome (MAS).¹ Multisystem inflammatory syndrome in children (MIS-C) causes significant morbidity and mortality, hence prompt identification and early aggressive treatment is necessary to reduce the same. Globally as of 8th November 2020, there have been 49.57 million confirmed cases of COVID-19 with 1.24 million deaths. In India as on 8th November 2020, there have been 8.5 million confirmed cases of COVID-19 with

0.13 million deaths.² Over here, we wish to present a case of multisystem inflammatory syndrome in children following COVID-19 infection which we had encountered and successfully managed in our resource limited setting. We wish to highlight that lymphocytopenia and thrombocytosis is not always associated with MISC.

CASE REPORT

A 3 year-old female child, who neither had any significant co-morbidities or previous hospitalization history visited the pediatric emergency services of our institute following six days of high grade continuous febrile illness. Rashes were present all over the body for past three days along with history of loose stools. Child was irritable and in hypotensive shock with wide pulse pressure, tachycardia (126/min), tachypnea (56/min) and SpO₂ value of 82% in room air. Subsequent physical examination revealed

periorbital puffiness, abdominal distension, bilateral edema of upper and lower limbs, fissures in the lips and evident maculopapular rashes all over the body. Upon auscultation, we could hear an S3 gallop. On examination respiratory and gastrointestinal system was normal.

We stabilized the airway and in view of persistent shock, we began administering fluid bolus (normal saline i.e. NS up to 40 ml/kg) along with initiation of inotrope (injection dobutamine at the rate of 10 mcg/kg/min). Initial laboratory investigations revealed neutrophilic leukocytosis (initial total count was 12,100 cells/mm³ and increased up to 17,500 cells/mm³ on day 5, N-58.5%, L-30.5%). Absolute lymphocyte count 3690 cells/cu mm, NL ratio 1.92 with thrombocytopenia (platelet 0.72 lakhs/cu mm), elevated prothrombin time (17.5 seconds) and low serum albumin (2 g/dl). Inflammatory markers showed elevated C-reactive protein (CRP) (145.3 mg/dl), serum ferritin (137.5 pg/ml), interleukin-6 (IL-6) (19.8 pg/ml), D-dimer (3883 ng/ml), procalcitonin (9.06 ng/ml) and troponin I (0.213 ng/ml). Chest X ray showed cardiomegaly. 2D echo which revealed mitral valve prolapse syndrome with mild mitral regurgitation, normal biventricular function and no significant coronary artery abnormalities. Ultrasonography of abdomen, erythrocytic sedimentation rate (ESR), liver function tests, urine microscopy were within normal limits. This narrowed our differential diagnosis to few inflammatory diseases such as Kawasaki disease, multi system inflammatory syndrome due to COVID-19, toxic shock syndrome, and haemophagocytic lymphohistiocytosis.

Considering the ongoing COVID pandemic, real time-polymerase chain reaction (RT PCR) was done in order to

identify SARS-CoV2 virus and found to be negative. Further we evaluated for COVID immunoglobulin G (IgG) antibody and it was positive (32.14 s/co) suggesting it could be post COVID-19 sequelae i.e. multi system inflammatory syndrome which closely resembles Kawasaki like illness.

Child was treated with IV antibiotics empirically (injection piperacillin tazobactam 300 mg/kg/day, injection amikacin 15 mg/kg/day), IV immunoglobulin 2 g/kg infusion over 20 hours in view of atypical Kawasaki disease, IV methyl prednisolone 1 mg/kg/day, inotropes (injection nor adrenaline at 0.1 mcg/kg/min and injection dobutamine at 10 mcg/kg/min). In view of decreasing platelet counts, anticoagulants was not started initially, Vitals were monitored continuously. Child was afebrile after 30 hours of IV IG infusion. Child maintained saturation in room air on 3rd day and so was weaned from oxygen. Inotropes were tapered and stopped. The repeat platelet count on 4th day turned out to be normal (3.5 lakhs/cu mm) and so we started injection enoxaparin at 1 mg/kg/day. Repeat D dimer value were: 2809 ng/ml (4th day) 1100 ng/ml (7th day), blood culture was sterile and other infective causes for thrombocytopenia workup (dengue and scrub IgM) were negative, which confirmed the case definition of MISC and following this, we had stopped the antibiotics on 7th day of admission. Child was discharged on 10th day of admission with advice to continue anti-inflammatory dose of aspirin and injection enoxaparin owing to the increased D dimer values. During review after 10th day of discharge repeat D dimer value was normal (520 ng/ml) and repeat echo did not suggest any new lesion. We stopped injection enoxaparin and continued aspirin at anti platelet dose for 6 weeks.

Table 1: Laboratory investigations.

Investigations	Days after admission									
	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day	20th day	
ESR	Normal					Normal				
Platelets (lakhs/cumm)	0.93	0.72	1.51		3.23					
Total WBC count (cell/mm³)	12100	14900	15300		17500					
Absolute lymphocyte count	3690	3501	2998		2245					
NL ratio	1.92	2.95	3.89		3.6					
D dimer (ng/ml)	3883		2809					1100	520	
Serum ferritin (mcg/l)	137.5		138		138					
CRP (mg/l)		145.3	64.8		50.5	24		10.8		
IL 6 (pg/ml)		1.5			19.8					
Procalcitonin (ng/ml)	9.06									
PT					17.5					
INR					1.26					
APTT					28.6					

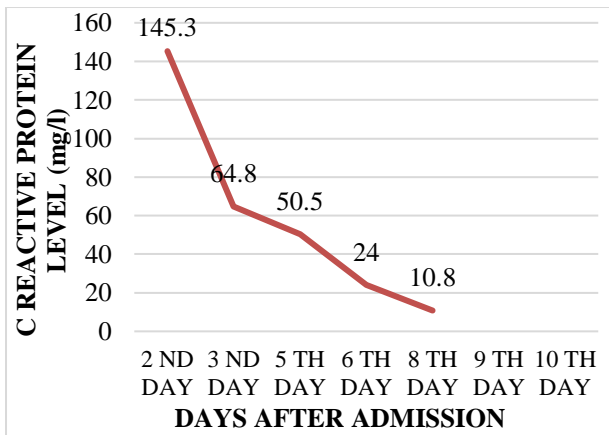


Figure 1: Trend of CRP level.

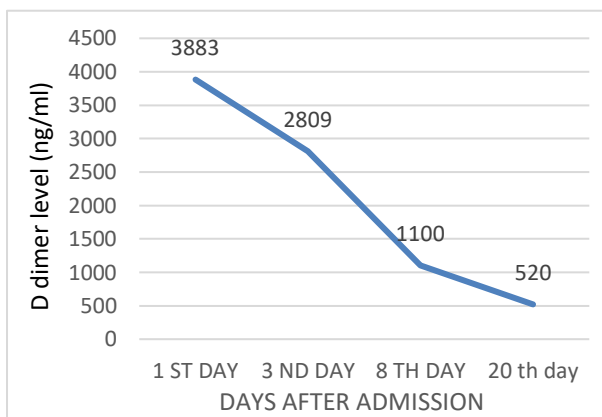


Figure 2. Trend of D dimer level.

DISCUSSION

This child presented with atypical Kawasaki disease such as fever, maculopapular rash, and edema of hands and feet, fissured lips but this child also had hemodynamic instability and respiratory distress which are not common in Kawasaki disease. As the child presented with multisystem involvement with raised inflammatory markers and positive COVID Ig G, started on IV IG and IV steroids. Earlier initiation of steroids will prevent the incidence of intubation and subsequent ventilation, progression to acute respiratory distress syndrome (ARDS) and reduce the hospital stay.³⁻⁵ In a study done by Helenkest et al children presented with the similar complaints found to be RT PCR positive but in this study the child's RT PCR test was negative.⁶ This was clearly depicted in a study done by Whittaker et al which showed that only 26% of children were positive for SARS-CoV-2 polymerase chain reaction tests whereas 87% were positive for SARS-CoV-2 Ig G test.⁷ It suggests that MIS-C may be due to immune dysregulation after acute COVID infection which could have occurred with mild symptoms and went unnoticed.

In Kawasaki disease coronary artery abnormality was common when compared to MIS-C child.⁸ In MIS-C child

coronary artery dilatation was less severe and transient whereas in this child no coronary artery involvement was seen.

In a case report published by Okarska-Napierała et al and Nguyen et al, lymphopenia was noted in their cases but in this child no lymphopenia was seen.^{9,10} As per Latent class analysis done at United States, this child had clinical presentation similar to class 1 except lymphopenia.¹¹ At the time of admission this child presented with thrombocytopenia whereas the case reported by Nguyen et al platelets were normal for their case.¹⁰ It reveals that MIS-C cases can have variable presentation.

CONCLUSION

Children presenting with MIS-C most often have a silent course of acute COVID infection. Lymphopenia and thrombocytosis are not always associated with MIS-C. Covid antibody with inflammatory markers like CRP, D-Dimer plays an important role in the management and during follow up. More pediatric studies are needed regarding the role of aspirin in MIS-C with Kawasaki disease overlap, choice of anticoagulant in a thrombocytopenic child and any markers which could predict the development of MIS-C during acute COVID infection.

ACKNOWLEDGEMENTS

Authors are thankful to Dr. S. Ramesh, Dr. C. S. Balachandran, Dr. S. Saravanan, all faculties, all post graduate students and all staffs in the department of pediatrics, Raja Muthiah Medical College and Hospital.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

1. Nakra NA, Blumberg DA, Herrera-Guerra A, Lakshminrusimha S. Multi-System Inflammatory Syndrome in Children (MIS-C) Following SARS-CoV-2 Infection: Review of Clinical Presentation, Hypothetical Pathogenesis, and Proposed Management. *Children (Basel)*. 2020;7(7):69.
2. WHO Coronavirus Disease (COVID-19) Dashboard. Available at: <https://covid19.who.int/>. Accessed on: 20 September 2020.
3. Fadel R, Morrison AR, Vahia A, Smith ZR, Chaudhry Z, Bhargava P, et al. COVID-19 Management Task Force. Early Short-Course Corticosteroids in Hospitalized Patients with COVID-19. *Clin Infect Dis*. 2020;71(16):2114-20.
4. Wang Y, Jiang W, He Q, Wang C, Liu B, Dong N, et al. Early, low-dose and short-term application of corticosteroid treatment in patients with severe COVID-19 pneumonia: single-centre experience from Wuhan, China. *Medrxiv*. 2020.

5. Hennon TR, Penque MD, Abdul-Aziz R, Alibrahim OS, McGreevy MB, Prout AJ, et al. COVID-19 associated Multisystem Inflammatory Syndrome in Children (MIS-C) guidelines; a Western New York approach. *Prog Pediatr Cardiol.* 2020:101232.
6. Kest H, Kaushik A, DeBruin W, Colletti M, Goldberg D. Multisystem Inflammatory Syndrome in Children (MIS-C) Associated with 2019 Novel Coronavirus (SARS-CoV-2) Infection. *Case Rep Pediatr.* 2020;8875987.
7. Whittaker E, Bamford A, Kenny J, Kaforou M, Jones CE, Shah P, et al. Clinical Characteristics of 58 Children With a Pediatric Inflammatory Multisystem Syndrome Temporally Associated With SARS-CoV-2. *JAMA.* 2020;324(3):259-69.
8. Rowley AH, Shulman ST, Arditi M. Immune pathogenesis of COVID-19-related multisystem inflammatory syndrome in children. *J Clin Invest.* 2020;130(11):5619-21.
9. Okarska-Napierała M, Zalewska E, Kuchar E. Fever and diarrhea as the only symptoms of Multisystem Inflammatory Syndrome in Children (MIS-C). *Gastroenterology.* 2020;S0016-5085(20):35118-20.
10. Nguyen DC, Haydar H, Pace ER. Pediatric Case of Severe COVID-19 with Shock and Multisystem Inflammation. *Cureus.* 2020;12(6):e8915.

Cite this article as: Ravivarma P, Vijayakumar V, Ramanathan. Child with post COVID MISC presenting with atypical Kawasaki like features in a rural medical college. *Int J Contemp Pediatr* 2021;8:377-80.