

Case Report

Multisystem Inflammatory Syndrome in Children (MIS-C) with Kawasaki Disease (KD) phenotype – A case report

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ABSTRACT

The coronavirus pandemic has led to the emergence of a new entity in children called Multisystem Inflammatory Syndrome in Children (MIS-C), which has different phenotypes. Coronavirus disease 2019 (COVID-19) has affected all age groups, with the emergence of MIS-C, having features overlapping with Kawasaki Disease (KD). A case with a variant of MIS-C showing overlapping features of KD occurring in a child post-COVID infection is presented in this report. A 2-year-old male was presented with complaints of fever and rash for the past 6 days. Examination showed maculopapular rash, conjunctival congestion, and unilateral cervical lymphadenopathy. Routine investigations were suggestive of thrombocytopenia, transaminitis, hyponatremia, and positive C-reactive protein (CRP). The fever panel sent was negative. The patient was started on antibiotics provisionally. But in view of the persisting fever and clinical assessment, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) IgG antibody and D-dimer levels were elevated, which distinguished it from KD. The patient was diagnosed with a case of MIS-C with KD phenotype and managed accordingly. This case highlights that thorough clinical examination with necessary investigations helps in early diagnosis and timely treatment, since delay in diagnosis can lead to both short and long-term complications in MIS-C.

Key words: Multisystem Inflammatory Syndrome, Kawasaki Disease, COVID-19, SARS-CoV-2 Antibodies

Multisystem Inflammatory Syndrome in Children (MIS-C) is a novel, post-infectious hyperinflammatory condition associated with infection by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). It typically occurs 2–6 weeks after exposure to Coronavirus disease 2019 (COVID-19) and presents with persistent fever, rash, conjunctival congestion, gastrointestinal, cardiac, and mucocutaneous symptoms [1]. Initially, MIS-C was thought to be a variant of Kawasaki Disease (KD) because of overlapping clinical features such as rash, conjunctivitis, and lymphadenopathy. However, further studies have demonstrated that MIS-C and KD differ in epidemiology, immune response, laboratory parameters, and overall clinical course [2].

While KD predominantly affects children under five years of age and has an unknown etiology, MIS-C can occur across a broader pediatric age range and is triggered by an exaggerated immune response following SARS-CoV-2 infection. The case presented here highlights a Kawasaki-like presentation of MIS-C in a two-year-old child with markedly

elevated inflammatory markers without cardiac involvement, underscoring the importance of early recognition and prompt immunomodulatory treatment to prevent adverse outcomes [3].

CASE PRESENTATION

A two-year-old previously healthy male child presented with a high-grade fever lasting six days (maximum temperature 38.9°C), associated with chills, rigors, and erythematous rashes that initially appeared on the palms and cheeks before spreading to the entire body. There was no history of cough, vomiting, diarrhea, breathing difficulty, or abnormal body movements. One month prior, the child had a mild upper respiratory tract infection that was resolved with oral medications. There was no significant family history, and the child was developmentally normal and appropriately immunized for age.

On general examination, the child had erythematous maculopapular rashes over the entire body, oral ulcers, bilateral non-purulent conjunctival congestion, and right-sided

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cervical lymphadenopathy. Systemic examination findings were within normal limits.

Laboratory investigations revealed microcytic hypochromic anemia and thrombocytopenia (platelet count: 70,000/ μ L). Liver function tests showed transaminitis with serum glutamic oxaloacetic transaminase (SGOT) of 2022 IU/L and serum glutamic pyruvic transaminase (SGPT) of 153 IU/L. Inflammatory markers, including C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR), were elevated, while the coagulation profile was normal. Tests for malaria, dengue, scrub typhus, and enteric fever were negative.

Despite antibiotic therapy, the fever persisted. Considering the previous history of upper respiratory tract infection, SARS-CoV-2 IgG antibody testing was performed and found to be markedly elevated (10,340 AU/mL). D-dimer levels were also raised (3.91 mg/L). Imaging studies, including electrocardiogram (ECG), two-dimensional echocardiography (2D-ECHO), and abdominal ultrasonography (USG), revealed no abnormalities.

Based on clinical features, laboratory findings, and serological evidence of prior SARS-CoV-2 infection, a diagnosis of MIS-C with a KD-like phenotype was made. The child was treated with intravenous immunoglobulin (IVIg) and oral aspirin. His clinical condition gradually improved, and he was discharged after eight days of hospitalization. Follow-up 2D-ECHO was normal, and no complications were observed.

DISCUSSION

The diagnosis of MIS-C in the present case was supported by the presence of persistent fever, mucocutaneous involvement (rash, conjunctivitis, oral changes), unilateral lymphadenopathy, and elevated inflammatory markers, along with positive SARS-CoV-2 IgG antibodies. Although the presentation overlapped with KD, the raised D-dimer and prior history of COVID-19 exposure favored MIS-C.

This case resembled the Kawasaki phenotype of MIS-C, like those cases reported during the first and second waves of COVID-19 in India, as reported by Tiwari *et al.* Pessoa *et al.* described gastrointestinal manifestations as the predominant features [1]. De Paulis *et al.* reported neurological symptoms to be prominent in the KD-like MIS-C presentation [4]. Dhanalakshmi *et al.* observed multisystem involvement in 79% of cases, with mucocutaneous (74%), cardiovascular (63%), and gastrointestinal (42%) systems being most affected [5]. Kapoor *et al.* found gastrointestinal involvement in 92%, cardiovascular involvement in 85%, and CNS involvement in 74% of patients [4]. But in the current case, both initial and

follow-up 2D-ECHOs were normal, contrasting with the findings of Tiwari *et al.*, where 56% showed cardiac abnormalities, including coronary changes in 37% [6].

The child responded well to IVIg alone, without requiring corticosteroids or biologics. This is consistent with findings from Davies *et al.* and McArdle *et al.*, who reported no significant difference in outcomes between various treatment regimens of IVIg alone versus combination therapies [2,3]. The hospital stay of eight days in the present patient aligns with the average duration (6–8 days) reported in similar studies [2, 5, 6].

Early diagnosis and prompt immunomodulatory treatment lead to excellent outcomes in this case and thus could prevent potentially fatal complications such as multi-organ dysfunction.

CONCLUSION

This case report emphasizes the importance of considering MIS-C in children with persistent fever and systemic inflammation, particularly during the COVID era. The overlap with KD can be misleading; therefore, a thorough history and antibody testing are vital for accurate diagnosis.

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