Multisystem Inflammatory Syndrome in Children Related to COVID-19 With Urticarial Vasculitis – A Double Whammy!

There is still a dearth of data of the involvement of skin in the coronavirus disease 2019 (COVID-19), especially in pediatric patients. Herein, we describe the report of a child with COVID-19 related multisystem inflammatory syndrome in children (MIS-C), who developed hypocomplementemic urticarial vasculitis syndrome (HUVS) after recovery.

A previously healthy 18-month-old boy with a five day history of fever and abdominal tenderness was admitted to the pediatric in-patient department. His mother was suffering from COVID-19. On mucocutaneous examination, the child had multiple annular polycyclic erythematous plaques on trunk with conjunctival erythema (Fig. 1). The lesions had been rapidly progressive and persistent for the last three days. The child was febrile (39.4°C) and hypoxemic. The child was also experiencing diarrhea for three days along with hypotension (blood pressure 90/60 mmHg). Laboratory investigations revealed a positive RT-PCR for SARS-CoV-2 on two tests done three days apart, along with metabolic acidosis, leukocytosis, neutrophilia, lymphopenia, anemia and hypoalbuminemia with albuminuria.
Erythrocyte sedimentation rate (21 mm first hour reading) and C-reactive protein (19 mg/dL) were raised.

High resolution computed tomography (HRCT) showed ground glass opacities in <20% of both lungs. A diagnosis of MIS-C was made. Intravenous steroids and blood transfusion were given and ceftriaxone was administered, along with oxygen. Fever and other manifestations subsided in 14 days. However, the urticarial rash kept recurring even after 6 weeks on-and-off treatment with antihistaminics, raising the suspicion of chronic urticaria. Investigations to rule out possible causes of chronic urticaria revealed low complement levels, viz., C3 (30 mg/dL), C4 (6 mg/dL), CH50 (13 U/mL) and C1q (4.1 mg/dL), and persistent hypoalbuminemia. Histopathological analysis demonstrated superficial and deep perivascular and interstitial infiltrates, small blood vessel wall degeneration and a leukocytoclasia (Fig. 2).

Significant family history compatible with autoimmune diseases included a maternal grandmother with vitiligo and bullous pemphigoid, as well as hypothyroidism in mother. The child was diagnosed with hypocomplementemic urticarial vasculitis syndrome (HUVS). The child has been prescribed oral hydroxyzine hydrochloride and 4 mg monteleukast daily. Although, the child still develops flares, they are relieved on a temporary basis by a short course of oral steroids.

It has been established that COVID-19 infection can cause delayed hypersensitivity reaction, which can trigger MIS-C and vasculitis in recovering patients [1-3]. We hypothesize that the viral infection can potentially trigger complement deficiency and urticarial vasculitis, as seen in our case. Although our patient is currently not exhibiting any signs of an extracutaneous involvement, his presentation requires close monitoring. Clinicians need to be aware of COVID-19 as a potential cause for such presentation in children.

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