Case Report

Reactive infectious mucocutaneous eruptions associated with SARS-CoV-2 infection

Shaji Thomas John*, Gayathri K., Rizwana P., Abhay M. Martin

Department of Paediatrics and Dermatology, Baby Memorial Hospital, Calicut, Kerala, India

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*Correspondence:
Dr. Shaji T. John,
E-mail: doctorshaji@hotmail.com

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ABSTRACT

Several dermatological manifestations are described in COVID-19. A 3-year-old boy presented with fever, painful oral ulcers with COVID-19 infection. A diagnosis of reactive infectious mucocutaneous eruptions (RIME) was made. He was worked up for the usual causes of RIME but were all negative. His severe acute respiratory syndrome coronavirus-2 immunoglobulin M (SARS-CoV-2 IgM) was positive and he was managed with Intravenous hydrocortisone with which he improved dramatically. RIME might be the first/only manifestation of COVID-19 and it should be kept in mind.

Keywords: COVID-19, Reactive infectious mucocutaneous eruptions

INTRODUCTION

The World Health Organization (WHO) declared coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) as a pandemic in March 2020. Patients with SARS-CoV-2 infection may present with various manifestations like fever, flu like symptoms, cough, respiratory distress syndrome, gastrointestinal symptoms, cardiovascular complications and mucocutaneous lesions.

SARS-CoV-2 enters and invades host cells via the angiotensin converting enzyme-2 (ACE-2) membrane receptor. The single cell RNA-seq (scRNA-Seq) studies of ACE-2 expression have detected high levels of expression in keratinized epithelial cell surfaces of the oral cavity, such as the dorsum of the tongue and hard palate. Viral infections disrupt epithelial cells and trigger local inflammatory reactions that are abrupt in onset. In the oral mucosa they present as solitary or multiple blisters or ulcerations. Around seven clinical patterns have been identified as the dermatologic manifestations of COVID-19: morbilliform, pernio-like, urticarial, macular, erythematous, vesicular, papulo-squamous, and retiform purpura. The most common sites of involvement are the tongue (38%), labial mucosa (26%), and palate (22%).

CASE REPORT

A previously healthy 3-year-old male child presented with history of high-grade fever and pain in the oral cavity and odynophagia of 5 days duration. The eruptions started as a small elevated lesions on the lower lip which progressed over a few days into small vesicles. These ruptured into painful erosions which subsequently bled and formed haemorrhagic crusts and purulent ulcers. The eruptions were accompanied by fever and difficulty in swallowing. There was no preceding history of drug intake, consumption of food or artificial colours or infectious illness. There was also no history of cough, breathing difficulty, rhinorrhoea, or gastrointestinal symptoms at any time. There was also no family history of similar illness.

At the time of presentation, he had high grade fever (102.6 °F), but was not in distress. His vital signs were normal. Dermatologic examination revealed confluent hemorrhagic crusted erosions on the upper and lower lips, hard and soft palate, cheeks and tongue. The lesions were
tender to touch and bled easily. There was purulent discharge at the base of some erosions and had salivary drool due to difficulty in swallowing. There was no regional lymphadenopathy. There were discrete solitary vesicles on the wrist, foot and lower back. Systemic examination was unremarkable.

Based on the above clinical presentation, clinical possibilities of fixed eruptions (drug related and non-drug related), herpes simplex infection associated erythema multiforme (HAEM) and reactive infectious mucocutaneous eruption (RIME) were considered. Laboratory tests showed normal leucocyte count, liver function test and C-reactive protein (CRP). Tzanck smear test was negative for multinucleated giant cells. IgM serology for Herpes simplex virus (HSV) type 1 (most likely agent for Herpes labialis in a child) and polymerase chain reaction (PCR) test for HSV type 1 and type 2 were also negative. Hence Herpes virus infection was ruled out.

SARS CoV-2 infection was considered as another etiologic possibility. COVID reverse transcriptase-polymerase chain reaction (RT-PCR), D-dimer, Serum ferritin levels and SARS CoV-2 antibody tests were done. SARS-CoV-2 IgM was detected to be positive which suggested a recent infection. Mycoplasma infection was yet another etiology considered, but IgM mycoplasma was negative.

In view of the clinical presentation and lab findings, a diagnosis of RIME due to SARS CoV-2 was made.

**DISCUSSION**

RIME (previously known as mycoplasma-induced rash and mucositis) has arisen as the preferred terminology to include mucocutaneous eruptions that are caused by other infectious agents.\(^5\) It typically occurs as a late manifestation of exposure to mycoplasma and other infectious agents. RIME typically describes the clinical presentation of significant mucositis (oral, ocular, and anogenital) with only limited cutaneous involvement.

The association between RIME and SARS-CoV-2 has not been widely reported. On review of literature, only two cases of RIME have been reported in children.\(^6\) Both of them were in adolescents. They presented with fever, cough and had conjunctivitis and ulcerations over oral mucosa and glans penis. Their CRP was elevated with normal counts and they were SARS-COV-2 PCR positive at the time of admission. Both of them were treated with hydrocortisone, IVF, and analgesics. They had complete resolution of mucositis 1 week after discharge. Their clinical presentation was similar to our case. The combination of confirmed recent SARS-CoV-2 infection, absence of other concurrent clinical or laboratory-confirmed infections, and prominent mucositis suggests SARS-CoV-2 as an infectious trigger for RIME.

**CONCLUSION**

Clinicians should be aware that SARS-CoV-2 may precipitate RIME and that systemic corticosteroids may be of benefit.

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