

Unusual Presentation of COVID-19 as Atypical Kawasaki Disease in Children

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ABSTRACT

Coronavirus disease 2019 has led to a global pandemic, infecting individuals of all ages. Although pediatric population appears to be less affected and maximum cases were asymptomatic, mild or moderate cases but recent reports are showing some worrisome course of this Pandemic. Children are having unusual presentations of a Kawasaki disease (KD)-like inflammatory syndrome associated with COVID-19.

Keywords: Children, COVID-19, Kawasaki Disease, Pediatric Multi-System Inflammatory Syndrome Temporally Associated with COVID-19.

INTRODUCTION

Coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has led to a global pandemic, infecting individuals of all ages but the pediatric population appears to be only 2% of cases¹. An epidemiologic study reported that over 90% of patients amongst confirmed pediatric COVID-19 cases were asymptomatic, mild, or moderate cases². Although a systemic review findings were that the disease course in pediatric COVID-19 was milder than in adults, children had a better prognosis and deaths were extremely rare³ recent reports are showing some worrisome course of this Pandemic.

In United States, pediatric patients are showing unusual presentations of a Kawasaki disease(KD)-like inflammatory syndrome associated with COVID-19. The first known published case of classic

Kawasaki disease associated with COVID-19 was in late April where the infant presented with fever, blotchy rash, and minimal respiratory symptoms and later between April 29 and May 3 nearly 15 cases were noted. Later 64 cases were reported statewide and a health advisory was also issued where this was termed as "Pediatric Multi-System Inflammatory Syndrome Temporally Associated with COVID-19."

Even in Italy, Spain, and the U.K. have noted a Kawasaki-like disease among children coincident with the COVID-19 outbreaks there. British health authorities have warned that in children with severe COVID-19 are having features consistent with toxic shock syndrome and atypical Kawasaki disease like pain abdomen, gastrointestinal symptoms and cardiac involvement developing cardiogenic or vasogenic shock and requiring intensive care. Patients are requiring vasopressors for shock, given steroids and IV immunoglobulins. The unusual feature is that Kawasaki disease typically affects children age 5 years and younger, but many of these cases are reported in older children. Patients have high CRP [C-reactive protein], high ESR [erythrocyte sedimentation rate] and high ferritin. The AHA's Young Hearts Council said it is adopting the Royal College of Pediatrics and Child Health's case definition⁴ which doesn't require a positive PCR test for SARS-CoV-2.

Recently published in Lancet that in UK, during mid-April, 2020, a cluster of eight children with hyperinflammatory shock, showing features similar to atypical

Kawasaki disease or toxic shock syndrome⁵. Clinical presentations were fever (38-40°C), variable rash, conjunctivitis, peripheral oedema, and generalised extremity pain with significant gastrointestinal symptoms. All progressed to warm, vasogenic shock, refractory to volume resuscitation and eventually requiring inotropic support. Most of the children had no significant respiratory involvement but required mechanical ventilation for cardiovascular stabilization. Other features were pleural, pericardial, and ascitic effusions, suggestive of a diffuse inflammatory process. All children tested negative for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) on bronchoalveolar lavage or nasopharyngeal aspirates and had elevated C-reactive protein, procalcitonin, ferritin, triglycerides, and D-dimers. Baseline electrocardiograms were non-specific but a common echo finding was echogenic coronary vessels, which progressed to giant coronary aneurysm in one patient within a week. The myocardial involvement was evidenced by elevated cardiac enzymes⁶. All children were given intravenous immunoglobulin (2 g/kg) in the first 24 h, and antibiotic cover including Ceftriaxone and Clindamycin and six children have been given 50 mg/kg aspirin. All of the children were discharged and later two of the children have tested positive for SARSCoV-2. All children are receiving ongoing surveillance for coronary abnormalities.

Over the past three weeks there has been an apparent rise in the number of children of all ages presenting with a multisystem inflammatory state with overlapping features of toxic shock syndrome and atypical Kawasaki disease with blood parameters consistent with severe covid-19 in children across London and other regions of the UK⁷.

Although it is believed that Kawasaki disease is an immune response triggered by infection, but its etiology as for which viruses predispose to Kawasaki disease is still not clear. As per earlier case control study, the HCoV-NH infection is

associated and Kawasaki disease⁸. In another study of 222 patients with KD admitted to the hospital, 192 (86%) had a respiratory viral PCR test performed and ninety-three (41.9%) of the 192 patients with KD had a positive respiratory viral PCR, and the majority were positive for rhinovirus/enterovirus.⁹

To better understand the current situation, the American Heart Association (AHA) council have called for enrolling affected children in COVID-19 studies and obtain serum or plasma samples. Even one community-based study on 6,000-person, Healthcare worker Exposure Response and outcome (HEROS study) in the National Institute of Allergy and Infectious Diseases (NIAID)'s looking into the rate of SARS-CoV-2 infection in U.S. children and their family members, which collects nasal swab and blood samples from participants every 2 weeks.

So, in this current Pandemic if a child is presenting with persistent fever with features of inflammation like neutrophilia, lymphopenia and elevated CRP along with evidence of single or multi-organ dysfunction, then may fulfil full or partial criteria for Kawasaki disease and treatment and monitoring should be carried on the same line, considering IVIG and aspirin early and regular monitoring.

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