


Special Issues for Coronavirus Disease 2019 in Children and Adolescents

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TO THE EDITOR: A high prevalence of obesity in patients with severe coronavirus disease 2019 (COVID-19) requiring invasive mechanical ventilation was recently reported (1). We wish to remind readers that children and adolescents can have COVID-19 and that the disease may be extrapulmonary.

Case Report

On March 28, 2020, a 14-year-old boy, previously healthy and fully immunized, presented with fever, vomiting, and watery diarrhea for 7 days but had no respiratory symptoms. No family member had symptoms of COVID-19. On clinical examination, he was pale and dehydrated and had a blood pressure of 105/65 mm Hg, a pulse rate of 102 beats per minute, an oxygen saturation of 97%, and an axillary temperature of 39.8°C. The BMI was 34 kg/m². On physical examination, he had tenderness over the lower left quadrant with a positive Blumberg sign. The chest x-ray showed negative results. The initial blood count showed leukocytosis, neutrophilia, and eosinopenia but showed normal hemoglobin and hematocrit. He had elevated creatinine and creatine kinase isoenzyme and a slight increase in transaminase and gamma-glutamyl transferase. The D-dimer and international normalized ratio were increased, but the prothrombin time was low. C-reactive protein and procalcitonin were increased. Ultrasound results showed no abnormalities of the liver, kidneys, or spleen and showed adequate peristalsis.

Intravenous ceftriaxone at 2 g/d was started, and fluid replacement began. A nasopharyngeal swab was negative for severe acute

respiratory syndrome coronavirus 2 (SARS-CoV-2) and other viruses. Before the administration of antibiotic therapy, a fecal sample was obtained and was negative for bacterial pathogens and viruses. Six hours after admission, conditions worsened rapidly: he had orthopnea (O₂ saturation of 92%, respiratory rate of 22 breaths per minute), tachycardia (145 beats per minute), chest pain, and oliguria. The patient began high-flow oxygen therapy and rapid-bolus fluid replacement. The electrocardiogram showed sinus tachycardia. Transthoracic echocardiography showed hypokinesis of the posterior septum and inferior wall, with decreased left ventricle ejection fraction (<60%). Moderate mitral-valve regurgitation was described. Myocardial enzymes were significantly increased. A second nasopharyngeal swab was performed and was positive for SARS-CoV-2. The patient progressed with further myocardial damage, renal failure, and increased inflammatory markers and was admitted to the pediatric intensive care unit. Over the next days, the patient stabilized and was discharged without significant complaints. After 2 weeks, he had two consecutive negative swabs for SARS-CoV-2.


Admissions Review

We reviewed admissions at two hub hospitals in Northern Italy and found admissions for 52 children and adolescents (24 males, mean age of 6.2 years) with COVID-19 diagnoses from March 1 to May 2, 2020. Only one girl had obesity (BMI of 39) with comorbidities, including Whipple disease, systemic lupus erythematosus, and tetraparesis. She had bilateral pneumonia but recovered after 20 days. All the other children and adolescents had normal weight and required low-intensity care.

Obesity is associated with a chronic low-grade inflammation that may amplify infection-dependent inflammation and promote hyperinflammation occurrence in severe COVID-19 (2). Adipose tissue may also be a reservoir for viral spread through increased shedding (3). As a consequence, obesity represents a

relevant pathogenic mechanism worsening the inflammatory cascade involved in the SARS-CoV-2 immune response (4). Therefore, obesity per se may be an independent risk factor for severe COVID-19 (5).

Our case and survey of pediatric COVID-19 admissions in Northern Italy provide important lessons. First, children and adolescents can contract COVID-19, as shown in our review of admissions. Second, in our case report, initial negative testing for COVID-19 and the absence of respiratory symptoms were misleading. This disease can become severe, even in children, and it can have presentations beyond pulmonary symptoms.

Patients with obesity and COVID-19, even young patients, require attentive care because of their risk for complications. Moreover, subjects with obesity should rigorously comply with preventive measures, including wearing masks and gloves, handwashing, and social distancing. 

Disclosure: The authors declared no conflict of interest.

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doi: 10.1002/oby.22878