Association Between COVID-19 and Kawasaki Disease: Vigilance

Required from Otolaryngologists

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Abstract:

With the onset of the COVID-19 pandemic, many novel presentations of known conditions are occurring. In the pediatric population, new instances of Kawasaki disease (KD) have recently been singled out as presenting in conjunction with or soon after diagnosis of COVID-19. This poses a novel situation, particularly for otolaryngologists, who may be the first to encounter these patients. Otolaryngologists should be cognizant of the co-existence of both conditions to allow for timely recognition and optimal management.
**Introduction:**

Kawasaki Disease (KD) is a rare systemic medium vessel vasculitis that occurs most often in children between 5 months and 5 years of age. There is a higher incidence in children of Asian descent but it can occur in children of any race or nationality. While it can be mild, KD has a predilection for coronary arteries, giving it deadly potential. Time to diagnosis is crucial in these patients as earlier diagnosis and treatment can mitigate or even prevent deadly sequelae. According to the American Heart Association (AHA), in addition to fever, there are five criteria for diagnosing KD: oral mucosal changes, bilateral non-exudative conjunctivitis, exanthemous rash, desquamation most often of the hands and feet, and cervical lymphadenopathy.

With the new pandemic of coronavirus disease 2019 (COVID-19), new presentations of known conditions are being seen for the first time, such as stroke in younger adults and the association of ARDS with encephalopathy. These include pediatric and adult conditions alike. Several reports have recently highlighted a spike in the incidence of KD in the COVID-19 positive pediatric population. These presentations of KD may occur weeks after the diagnosis of COVID-19 and possibly once the patient has recovered from the virus.

**Discussion:**

The etiology of KD is unknown. However, there have been theories related to infectious triggers. There are two overall forms of KD: complete and incomplete. In the complete form, patients meet at least 4 of the 5 AHA criteria for KD. In the incomplete form, patients have less than 4 of the AHA diagnostic criteria and can mimic other
common childhood illnesses. Additionally, KD is a diagnosis of exclusion with no specific diagnostic test. This poses difficulty and can delay diagnosis. The longer KD goes undiagnosed, the greater the chance for coronary artery ectasias, aneurysms and other cardiac conditions.

Pursuant to the theory of infectious triggers, recent reports of increased incidence of KD in the presence of COVID-19 follow logical lines of the disease process. A case report published on April 7, 2020 reported coexistence of COVID-19 positivity and KD\textsuperscript{7}. This may be the first reported case of these two conditions seen in conjunction with each other. On April 28, 2020\textsuperscript{4}, news reports arose of new increased rates of severe KD in pediatric patients with no underlying health conditions. Physicians in Italy and Britain were quoted saying they feared the new incidence was related to COVID-19 positivity. Following that, on April 29, 2020\textsuperscript{5}, another news source released an article reporting the likelihood of a link between COVID-19 and KD. Since then, multiple news sources have accounts of these two conditions appearing simultaneously or in quick succession. Of particular note is the report of 15 possible KD cases in pediatric patients, majority diagnosed with COVID-19, in Mount Sinai Hospital in New York City\textsuperscript{8}. Possible cases of children with both conditions in California and Illinois have been mentioned as well. COVID-19 has been noted to damage the myocardium. Greater cardiac protection may be important for those with pre-existing cardiac conditions\textsuperscript{9}. Kawasaki disease, a vasculitis affecting the heart, can have greater cardiac implication in the presence of COVID-19. Delays in diagnosis of KD can multiply this phenomenon in greater capacity than without the cardiac affects of COVID-19.
Of the five criteria specified by the AHA, two include otolaryngology presentations. The first of the otolaryngologic symptoms included in the AHA criteria is oral mucosal changes such as erythematous tongue with enlarged papilla otherwise described as “strawberry tongue” or fissured lips. The second is cervical lymphadenopathy. Sore throat and neck stiffness may accompany the condition, as well, despite not being part of the official AHA criteria\(^1\). This places the otolaryngologist in a unique position. Particularly in the presence of fever, otolaryngologists may be the first physicians to encounter these patients. Typically, KD is not a leading diagnosis on the otolaryngologist’s differential. However, with the novel COVID-19 pandemic and reported rise in KD cases, otolaryngologists may need to alter their differential list and index of suspicion.

Although the current reporting is in early stages, given the wide-reaching impacts of delays in diagnosis in both COVID-19 and KD, vigilance on our part is warranted. Further reports of cases with COVID-19 and KD are important, so that the true association between the two can be more carefully ascertained. This has already been requested from the New York City Health Department\(^10\). In addition, reporting of clinical outcomes is important to ensure optimal outcomes of children who present with both conditions.

**Conclusion:**

There have been reports of KD in conjunction with COVID-19 positivity in multiple countries around the world. KD may present with more than one otolaryngologic symptom. With that in mind, particularly in this time of new presentations of old
conditions, it would be prudent for otolaryngologists worldwide to be aware of the potential association between these conditions.
References:


