

COVID-19 and Kawasaki syndrome: should we really be surprised?

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Letter to the Editor

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Abstract

A hyperinflammatory response to COVID-19 is being described in children. While this presents, and responds to management, similar to that of Kawasaki Disease it is being coined a new entity. But is it really? We explore how this phenomenon may be Kawasaki Disease with a new trigger.

Recent reports have described a hyperinflammatory response to the novel, pandemic coronavirus, COVID-19. This entity has been described to resemble Kawasaki Disease with some of these children displaying coronary artery changes characteristic of Kawasaki Disease.¹ Though, this entity has generated large media attention, should the medical community be really surprised?

While the aetiology of Kawasaki Disease has been considered elusive for some time, there is substantial data pointing to a likely viral aetiology.^{2–5} Many have hypothesised that some children may be genetically predisposed to a more robust inflammatory response to specific viruses. Once exposed to the specific virus, children then mount this exaggerated inflammatory response which clinically manifests as what is now defined to be Kawasaki Disease. Data from the Taiwanese national database have demonstrated the link of viral illness to Kawasaki Disease as have multiple other studies and case reports.⁶ One study even was able to isolate novel, viral RNA from cytoplasmic inclusion bodies in children with Kawasaki Disease, further demonstrating a viral association. Viruses associated with Kawasaki Disease include Influenza, Enterovirus, Adenovirus, Parvovirus, Rhovirus, respiratory syncytial virus, Varicella, Epstein-Barr, measles, and dengue.^{7–21} Association with previous coronavirus has also been demonstrated.²² With this in mind why should Kawasaki Disease with COVID-19 come as a surprise?

Additionally, hyperinflammatory response to COVID-19 has been reported at length in adults. Elevated inflammatory and reactive markers include C-reactive protein, procalcitonin, ferritin, and D-dimer among others. In fact, these have prognostic value as more ill COVID-19 patients have higher values. In adults, accumulating evidence suggests that a subgroup of patients with severe COVID-19 have a “*cytokine storm syndrome*” in which a cascade of activated cytokines leads to harmful auto-amplifying hyperinflammatory cytokine production.^{23,24} Adult patients with worse illness and greater evidence of inflammation also had a higher incidence of cardiac findings such as troponin leak and ventricular dysfunction. Thus, these findings also may simply be inherent to more severe COVID-19 secondary to overall inflammatory response. This has been noted in viremia from other agents as well, particularly in the form of myocarditis.

While characterising the effects of COVID-19 is important, we also must put these findings in context of what is previously known in relation to viruses and critical illness. We must be vigilant to not inappropriately create new clinical entities or exaggerate previous clinical entities simply because of association with COVID-19. For those meeting criteria of Kawasaki Disease or presenting like myocarditis, the diagnosis should be Kawasaki Disease and myocarditis, as appropriate, and not a new clinical diagnosis; and furthermore, clinical management should be as such. Future effort should continue to focus on determining the reasons for the coronary artery involvement and the virus tropism for the myocardium.

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