Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letter to the Editor

Kawasaki disease and COVID-19; a pretext for a hot topic

Dear Editor

At 2019 March, a very contagious Corona Virus disease was distinguished which most likely involved upper and lower respiratory tracts and may be life threatening due to respiratory distress syndrome (SARS) features. This disease named SARS-Cov2 (COVID-19) and it announced as pandemic disease by WHO.[1]

Initially, the disease has not been enough considered in children because "the vast majority of infected children have mild or unrecognized disease".[2] Although various presentations of this disease were frequently published, cardiac and non-pulmonary features of SARS-Cov2 in pediatrics population were not fully identified.[1,3]

Recently, a possible correlation between Kawasaki disease (KD), as an autoimmune disorder with mucocutaneous-lymph node involvement, and COVID-19 in pediatrics has been raised.[4—6] We also would like to present a relevant case with the mentioned possible association to help researcher to find more aspect of this disease.

A 7-year-old girl presented to our tertiary pediatrics health care service with fever and skin rash since 4 days. At first look there is thrombocytopenia in cell blood count (platelet 50,000). The patient was examined for fever (temperature 39 oc) and extensive maculopapular lesions in the abdomen and back that were slightly itchy. Coetaneous erythema of the fingers without edema, as well as individual similar lesions on the knees and legs (Fig. 1), a slight red sclera, and a slight erythematic lips & throat were found in physical examination. Other examinations were normal.

From 3 days ago, the patient had several vomiting and decreased appetite and pain in her lower abdomen, and from the previous day of presentation to our hospital, she mentioned the elimination of watery diarrhea once. Two days after admission, abdominal distension and pain and also respiratory distress is appeared.

Chest CT scan to assess for COVID-19 with was epidemic in our region was done and the following findings were seen; peripheral & bilateral ground glass opacities in lower lobes, cardiomegaly, pleural effusion in both side and free fluid at upper abdominal slides, prominent pulmonary arteries, bilateral central pribronchial cuffing (Fig. 2a,b). Although bilateral GGO was compatible with COVID-19,[7] the 4 recent findings support another diagnosis in addition to COVID-19 induced cardiac edema such as KD. Therefore the patient was undergone echocardiography and the findings were including; Moderate Mitral regurgitation, moderate tricuspid regurgitation, mild pericardial effusion, acute myocarditis, Ejection fraction of 20%, dilated cardiomyopathy.

KD was confirmed and due to on another related underlying disorders, COVID-19 related KD was suggested.

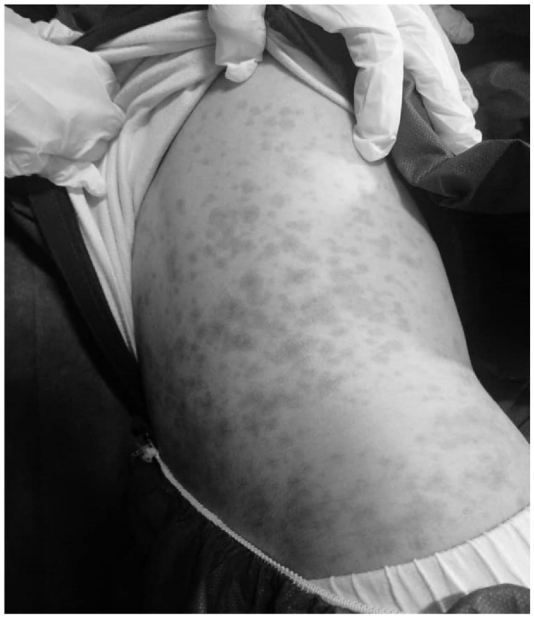

Figure 1 Extensive maculopapular lesions located at the abdomen.

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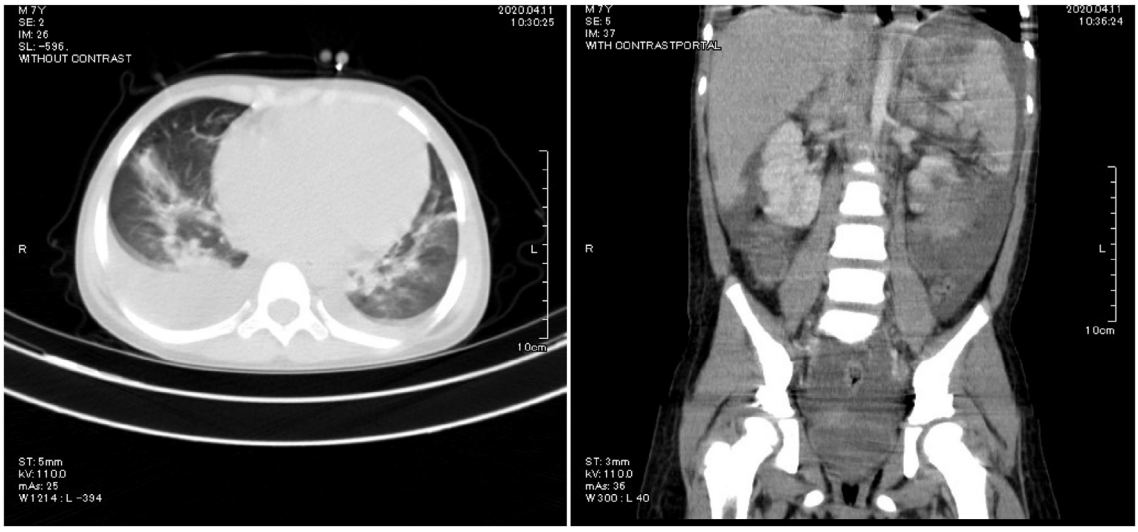

Figure 2 **a**; pleural effusion, pericardial effusion, bilateral patchy ground glass and air space opacities. **b**; considerable ascite.

Treatment was started with Lasix 1 mg/kg, Dopamine 7 μg/kg, IVIG 2 mg/day, Aspirin 80 mg/kg in addition to COVID-19 medications (hydroxychloroquine). Symptoms were relief during one weeks and the case was discharge with stable situation.

KD characteristics are including: fever, Rash, BCG scar erythema and induration, Palm and/or sole erythema and induration, Desquamation, Bulbar conjunctivitis, Red lip with fissure and/or strawberry tongue, Neck lymphadenopathy, Cough, Rhinorrhea, Diarrhea, Coronary arterial lesions, Coronary arterial aneurysm. These features have overlapping (but milder) with cytokine storm syndrome previously reported in COVID-19 cases.[8]

On the other hand, it was previously reported that "some common respiratory viruses, such as adenoviruses, enteroviruses, rhinoviruses, and coronaviruses, were associated with KD cases".[9] A cross reaction between viral/bacterial antigen and vascular endothelial antigen is a strong hypothesis about KD and infectious diseases.[10] Moreover, defect in maturation of immune system in response of an infectious agent to induce KD is another one. Likewise, it was reported that "Kawasaki disease may result from an abnormal clonal expansion of CD8+ T cells in response to an infectious agent and therefore, predisposition of the host, in addition to the antigenic properties of the virus, may play an important role in the vasculitis of Kawasaki disease".[11]

Finally, the worrying point is that; there are some nationwide epidemics in Japan were reported after bacterial/viral infections and therefore, we will probably have to wait for a major global epidemic of KD after the peak of COVID-19 subsides. There is evidence for this claim; the association between SARS-Cov1 and KD previously declared at 2005.[12]

There are some suggestions for further studies to confirm or reject this hypothesis; first of all, a cross sectional study conducted on KD cases for suspected symptoms of Covid-19 (an epidemiologic study). Then confirm the correlation between Corona virus 2019 antigen/antibody titer and KD prevalence and a controlled matched group without KD. Finally, assess the relationship between the severities of the KD with COVID-19 severity. An experimental in vitro study should be conducted on Rats infected with Covid-19 virus and followed for similar symptoms of KD.

Until the final correlation was declared, it was suggested that follow the new cases of COVID-19 for avid or subtle symptoms of KD and then exclude the overlap diseases such as Juvenile rheumatoid arthritis, Scarlet fever, etc and also check the B-type natriuretic peptide (BNP) as a marker of heart stress condition which is useful in KD diagnosis.[13]

Conflicts of interest

None.

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