



Consider multisystem inflammatory syndrome in children with kidney failure after SARS-CoV-2 vaccination

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Letter to the Editor,

We read with interest the article by Kim et al. about a 16-year-old female who developed dyspnoea and headache 2 weeks and renal insufficiency 6 weeks after having received the second dose of the BioNTech Pfizer vaccine (BPV) [1]. Work-up revealed myocarditis and renal insufficiency being attributed to glomerulonephritis [1]. Upon steroids, mycophenolate mofetil, and temporary haemodialysis, renal insufficiency incompletely resolved [1]. The study is promising but raises concerns that should be discussed.

We disagree with the notion that there was a causal relation between vaccination and kidney failure, as suggested in the report [1]. The latency between vaccination and onset of kidney disease was about 6 weeks [1], thus fairly long [1]. Furthermore, only a few cases with renal insufficiency following a SARS-CoV-2 vaccination have been reported thus far [1]. The authors themselves speculate that kidney disease could have been present already, prior to vaccination [1]. It is also unclear how the authors know that kidney failure started 2 weeks after vaccination. No laboratory parameters were presented from that time.

We disagree that the patient had myocarditis [1]. Myocarditis is diagnosed upon endomyocardial biopsy or cardiac MRI with contrast medium. However, there is no mention that cardiac MRI was carried out with application of gadolinium. We should know if there was early or late gadolinium enhancement on cardiac MRI. We also should know why fibrosis was suspected and not active myocarditis. Was late enhancement observed, which would argue in favour of fibrosis? Furthermore, it is unclear how the authors know that myocardial fibrosis resulted from myocarditis [1]. Myocardial fibrosis can be due to a broad spectrum of disease, which all need to be ruled out before attributing fibrosis

to myocarditis. Missing are the results of the ECG and a follow-up of the ECG, laboratory tests, and the cardiac MRI.

A further limitation is that some symptoms leading to hospitalisation were not sufficiently investigated. Headache occurred 2 weeks after the vaccination and persisted at least until admission, thus 4 weeks. Persisting headache during 4 weeks is rather not due to arterial hypertension. Therefore, venous sinus thrombosis, a common complication of SARS-CoV-2 vaccination [2], and more rare complications of SARS-CoV-2 vaccinations, such as reversible cerebral vasoconstriction syndrome (RCVS), cerebral vasculitis, and subarachnoid and intra-cerebral bleeding, need to be ruled out. A cerebral MRI is mandatory in the index case.

Another limitation is that it was not specified at which location oedema occurred, which type of oedema was diagnosed, and if oedema resolved upon application of the treatment against renal insufficiency. Since proBNP was elevated and since there was suspicion of myocarditis, it cannot be ruled out that oedema was due to heart failure. Heart failure may occur even in the absence of systolic dysfunction.

The patient presented with elevated creatine-kinase (CK), lactate dehydrogenase, myoglobin, and renal insufficiency [1]. We should know if rhabdomyolysis with renal insufficiency had been considered as the cause of the laboratory abnormalities. It should also be reported if there were any clinical manifestations of myositis, previously reported as a complication of SARS-CoV-2 vaccinations [3]. Did the patient report easy fatigability, exercise intolerance, myalgia, or muscle cramps? The patient obviously manifested not only in the kidneys, but also in the myocardium and possibly the skeletal muscles. This is why multisystem inflammatory syndrome in children (MIS-C) should be considered.

Missing is the evolution of the symptoms, exertional dyspnoea, and headache. Missing are reference limits of the blood and urine tests [1].

Overall, the interesting study has limitations that call the results and their interpretation into question. Clarifying these weaknesses would strengthen the conclusions and

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could improve the study. The patient rather had MIS-C than only glomerulonephritis. Whether there is a causal relationship between MIS-C and the vaccination remains unproven.

Author contribution JF was responsible for all requirements.

Data availability Not applicable.

Declarations

Ethics approval Not applicable.

Competing interests The author declares no competing interests.

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