



## IgA nephropathy presenting as rapidly progressive glomerulonephritis following first dose of COVID-19 vaccine

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To the Editors,

Coronavirus disease 2019 (COVID-19) has recently been associated with kidney disease in pediatric patients [1]. Interestingly, COVID-19 vaccination has also been described as a potential trigger of acute kidney injury (AKI); in particular, IgA nephropathy (IgAN) flare-ups following mRNA COVID-19 vaccination have been reported in adult [2] and pediatric patients [3]. However, the pediatric cases published so far described patients suffering from mild IgAN flare-ups occurring after the second dose of the COVID-19 vaccine.

Here, we describe the development of de novo IgAN occurring within 24 h following the first dose of mRNA COVID-19 vaccine. The patient was 13 years old, with no relevant medical history. In particular, she had no history of COVID-19 infection (SARS-CoV-2 PCR and serology were negative), and she never had reacted to any previous vaccinations. Within 24 h following the first dose of the Pfizer mRNA COVID-19 vaccine, she developed fever, asthenia, and muscle pain. Macroscopic hematuria was also reported. At admission, clinical examination showed a mild streptococcus-negative pharyngitis. Serum creatinine was 3.57 mg/dl, and blood urea nitrogen was 96 mg/dl. Macroscopic hematuria was accompanied by nephrotic range proteinuria (3.88 g/l). Other etiologic investigations came back negative, including immunological and infectious testing.

Kidney biopsy performed at day 4 post-vaccination is shown in Fig. 1. The estimated Oxford score was

M1E1S0T0. Kidney function rapidly deteriorated, and the patient became oliguric; as a consequence, hemodialysis was started. Treatment consisted of 3 IV methylprednisolone pulses, followed by oral prednisone. Kidney function improved progressively; hemodialysis was stopped at 5 days post-vaccination. At 11 days post-vaccination, serum creatinine was down to 1.9 mg/dl. At 30 days post-vaccination, serum creatinine had returned to almost normal values (0.86 mg/dl, leading to a GFR according to the Schwartz formula of 82 ml/min). Microscopic hematuria and a slight proteinuria persisted.

Unlike previous observations [2, 3], this report suggests that development of IgAN following COVID-19 vaccination may occur after the first dose of vaccine, and may present as a rapidly progressive glomerulonephritis leading to severe AKI. As with other case reports, COVID-19 vaccine responsibility in the IgAN flare-up reported here remains difficult to establish. Therefore, it appears essential to precisely assess the risk–benefit ratio of COVID-19 vaccination in all pediatric age groups, and to carefully plan COVID-19 vaccination in patients with chronic kidney disease at risk of relapsing.

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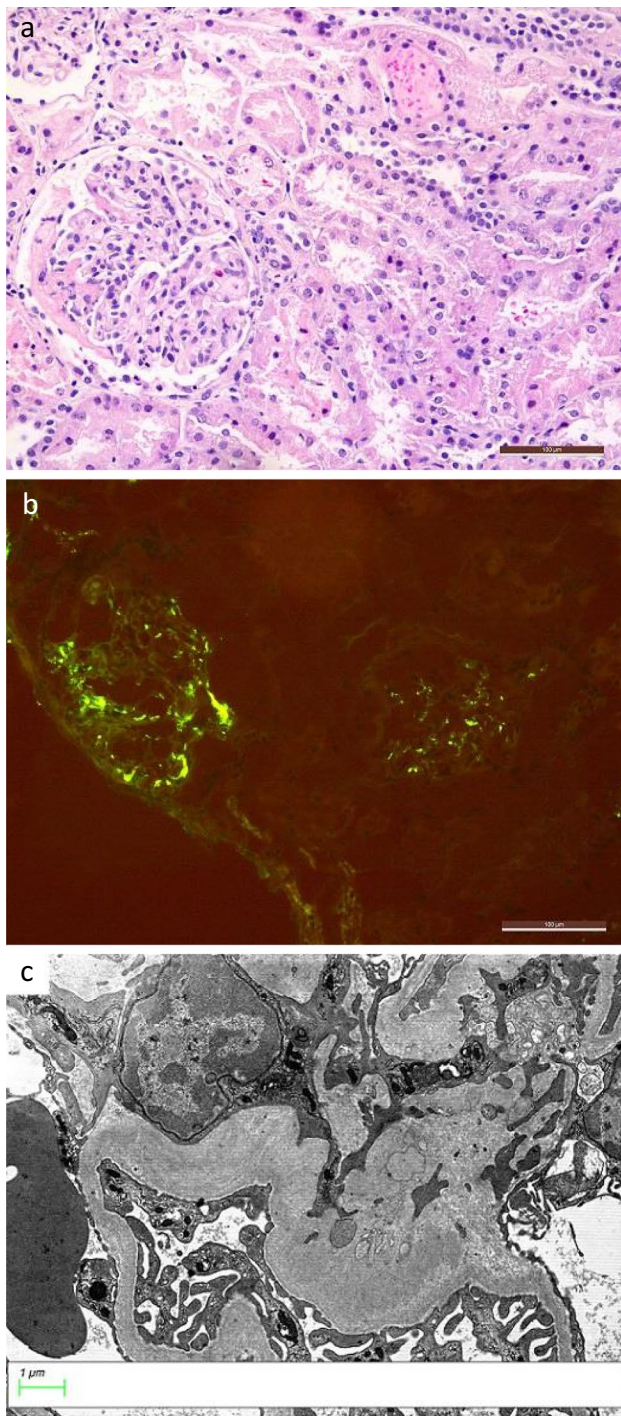
**Author contribution** All authors contributed to drafting, reviewing, and revising this paper.

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**Fig. 1** Pathology showing IgA nephropathy, Oxford score M1E1S0T0. **a** Optical microscopy (scale bar 100  $\mu\text{m}$ ). Mesangial and endocapillary proliferation. No constituted crescents were observed, but fibrin deposits were present in the Bowman space of most of the observed glomeruli. No evidence of renal scarring from previous kidney injury could be detected. **b** Immunofluorescence (scale bar 100  $\mu\text{m}$ ). Diffuse mesangial IgA and C3 deposits. Absence of other deposits. **c** Electron microscopy (scale bar 1  $\mu\text{m}$ ). Diffuse mesangial deposits

## Declarations

**Informed consent** Informed consent was obtained from legal guardians.

**Conflict of interest** The authors declare no competing interests.

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