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LETTER TO THE EDITORS

Two patients presenting IgA nephropathy after COVID-19 vaccination during a follow-up for asymptomatic hematuria

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To the Editors,

We read with great interest the report of a case of de novo immunoglobulin A nephropathy (IgAN) with gross hematuria following the use of an mRNA vaccine for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1]. In Japan, 27 cases of gross hematuria with related IgAN were reported following the use of an mRNA vaccine, but hitherto there have been no pediatric reports [2]. We herein report our experience of two pediatric patients with post-vaccination IgAN undergoing a follow-up for asymptomatic hematuria. Clinical information is shown in Table 1.

Case 1 was a 16-year-old male with occult hematuria detected by a school urinalysis. Asymptomatic hematuria (RBC: 50–100/HPF) was diagnosed, and he was seen regularly at our outpatient clinic for 2 years. His mother had received a diagnosis of IgAN. On the day following his second vaccination, the patient experienced fever and gross hematuria. Three days post-vaccination, the gross hematuria resolved, but 6 days post-vaccination, the serum creatine and proteinuria values were 1.1 mg/dL and 0.28 g/g creatinine, respectively, with the former increasing to 1.26 mg/dL on day 20 post-vaccination. Based on a kidney biopsy, IgAN with mild proliferation of mesangial cells and cellular crescents was diagnosed (Oxford Score: M0E1S0T0C1).

From post-vaccination day 35, pulse methylprednisolone 1 g was administered for three consecutive days over two consecutive weeks followed by prednisolone 60 mg every 2 days. On day 55 after vaccination, serum creatinine had failed to improve to 1.29 mg/dL; therefore, prednisolone was administered daily for 4 weeks with the addition of azathioprine. Thereafter, prednisolone was reduced to 60 mg every other day, and then gradually reduced to a maintenance dose of 30 mg every other day. At present, 3 months after vaccination, serum creatinine has decreased to 1.05 mg/dL.

Case 2 was that of a 13-year-old female patient in whom occult hematuria was detected by a school urinalysis. She was followed up for 2 months for the asymptomatic hematuria (RBC: 10–20/HPF). On the day after her second vaccination, she experienced fever and gross hematuria. Her urine protein-to-creatinine ratio rose to 1.99 g/g on day 7 post-vaccination. Her gross hematuria gradually resolved. IgAN with mild proliferation of mesangial cells was diagnosed by kidney biopsy (Oxford Score: M0E0S0T0C0). Her proteinuria resolved on day 26 post-vaccination without treatment.

Both patients had only microscopic hematuria in the past and had been followed up regularly before their vaccination against SARS-CoV-2. They both experienced gross hematuria for the first time, and the serum creatinine in one patient increased with crescent formation.

The SARS-CoV-2 vaccine may make subclinical IgAN manifest. In a previous report, two cases of acute serum creatinine increase after vaccination were reported in children and were later diagnosed as de novo IgAN [1, 3]. In Matsuzaki et al., 19 cases of IgAN in 27 adult patients who experienced gross hematuria after vaccination were linked to a history of IgAN. A similar association may occur in pediatric patients. Thus, not only children who have already received the diagnosis of IgAN but also those with asymptomatic hematuria should be informed of the risks and benefits of COVID-19 vaccination to prevent complications.

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Table 1 Clinical characteristics of the two pediatric patients with IgAN following COVID-19 vaccination

Patient no	Age, yrs	Sex	Variables	Before SARS-CoV-2 vaccination	Following SARS-CoV-2 vaccination
1	16	Male	Clinical symptoms	Microscopic hematuria	New-onset gross hematuria
			Serum creatinine, mg/dL	0.87	Day 6: 1.11 Day 20: 1.26 Day 55: 1.29 Day 100: 1.05
			Urine protein-to-creatinine ratio, g/g	0.03	Day 6: 0.28 Day 21: 0.35 Day 28: 0.31 Day 76–: 0.05〜0.10
			Oxford MEST-C score	M0E1S0T0C1	Day 24
			Treatment		Day 35 Start of steroid and immunosuppressive therapy
2	13	Female	Clinical symptoms	Microscopic hematuria	New-onset gross hematuria
			Serum creatinine, mg/dL	0.51	Day 12: 0.54
			Urine protein-to-creatinine ratio, g/g	0.08	Day 7: 1.99 Day 26: 0.11 Day 45–: 0.05–0.10
			Oxford MEST-C score	M0E0S0T0C0	Day 91
			Treatment		No treatment

IgAN, nephropathy; *MEST-C*, *M* = mesangial hypercellularity, *E* = endocapillary proliferation, *S* = segmental glomerulosclerosis, *T* = tubular atrophy/interstitial fibrosis, *C* = crescents

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Declarations

Conflict of interest The authors declare no competing interests.

References

1. Niel O, Florescu (2022) IgA nephropathy presenting as rapidly progressive glomerulonephritis following first dose of COVID-19 vaccine. Pediatr Nephrol 37:461–462. https://doi.org/10.1007/s00467-021-05351-x
2. Matsuzaki K, Aoki R, Nihei Y, Suzuki H, Kihara M, Yokoo T, Kashihara N, Narita I, Suzuki H (2021) Gross hematuria after SARS-CoV-2 vaccination: questionnaire survey in Japan. Clin Exp Nephrol. https://doi.org/10.1007/s10157-021-02157-x
3. Hanna C, Hernandez Herrera LP, Bu L, Kizilbash S, Najera L, Rheault MN, Czyzyk J, Kouri AM (2021) IgA nephropathy presenting as macroscopic hematuria in 2 pediatric patients after receiving the Pfizer COVID-19 vaccine. Kidney Int 100:705–706