was negative. A diagnostic kidney biopsy was performed. Serum creatinine rose to 3.6 mg/dl, and renal replacement therapy was started because of anuria and diuretic resistant fluid overload with pleural effusion and dyspnea. Steroids (1 mg/kg) were administrated, pending biopsy results. Light microscopy did not show significant glomerular nor tubular abnormalities, immunofluorescence was negative, and electron microscopy showed extensive foot process effacement (Figure 2), most of which are compatible with minimal change disease. Kidney function gradually recovered with decreasing proteinuria (2.3 g/l). After 3 weeks, hemodialysis could be stopped.

This case adds to other reports of new-onset nephrotic syndrome after COVID-19 vaccination.[2,3] If new-onset nephrotic syndrome incidence rises after this type of vaccination, reporting nephrotic syndrome as a side effect in patient information should be considered.

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Jari Weijers[1], Carmen Alvarez[1] and Marc M.H. Hermans[1]

[1]*Department of Internal Medicine, Division of Nephrology, Viecuri Medical Center, Venlo, the Netherlands*

Correspondence: *Marc M.H. Hermans, Department of Internal Medicine, Division of Nephrology, Viecuri Medical Center, Tegelseweg 210, 5912 BL, Venlo, The Netherlands. E-mail: marchermans@viecuri.nl*

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Minimal change disease and acute kidney injury following the Pfizer-BioNTech COVID-19 vaccine

To the editor: As mass vaccinations for coronavirus disease 2019 (COVID-19) are being administered worldwide, rare reports of adverse events are emerging. We report a case of minimal change disease presenting with nephrotic syndrome 1 week after a first injection of the COVID-19 vaccine (Pfizer-BioNTech).

A 77-year-old white male with a 15-year history of type 2 diabetes mellitus without retinopathy received a first dose of the Pfizer-BioNTech vaccine on March 17, 2021. Medical history included obesity, prior smoking, and coronary artery disease. Baseline serum creatinine ranged from 1.0 to 1.3 mg/dl, with no proteinuria over the previous year. Outpatient medications included atorvastatin, aspirin, dulaglutide, empagliflozin, glipizide, losartan, metformin, and metoprolol. There was no history of nonsteroidal anti-inflammatory drug use. Seven days after vaccination, he presented to his local physician complaining of abrupt onset of lower-extremity edema. Laboratory testing revealed 4+ proteinuria by dipstick and serum albumin of 2.5 g/dl. Nephrology consultation 12 days after vaccination found anasarca with 13.6-kg weight gain due to edema, elevated blood pressure (152/81 mm Hg), and 4+ proteinuria on urinalysis with inactive urine sediment, prompting hospital admission. Laboratory evaluation by 14 days after vaccination showed 24-hour urine protein of 23.2 g/d, serum creatinine of 2.33 mg/dl, and serum albumin of 3.0 g/dl. Complete blood cell count was normal, and hemoglobin A1c was 7.5%. Serologies included elevated C3 and C4 and negative hepatitis B surface antigen and hepatitis C antibody.

A kidney biopsy was performed 16 days after vaccination (Figure 1). Among 7 glomeruli sampled for light microscopy, 4 were globally sclerotic and 3 were histologically unremarkable. There was 25% tubular atrophy and interstitial fibrosis with moderate arteriosclerosis. Cortical tubules displayed diffuse acute epithelial injury. No immune deposits were identified by immunofluorescence (2 glomeruli) or electron microscopy (2 glomeruli). Electron microscopy revealed 100% podocyte foot process effacement, leading to a diagnosis of minimal change disease with acute tubular injury. The ultrastructural findings of minimal segmental mesangial sclerosis and glomerular basement membrane thickening (mean, 460 nm) suggested underlying mild diabetic changes.

Empiric pulse methylprednisolone, 1 g daily for 3 days, was initiated on hospital admission, followed by oral prednisone, 60 mg daily, after biopsy. In the hospital, he required i.v. furosemide drip, 10 mg/h, transitioned to bumetanide, 0.25 mg/h, for 5 days for fluid overload. Creatinine peaked during the hospitalization at 3.17 mg/dl at 19 days after vaccination. The patient was discharged 3 days later with 19.8 g/g proteinuria by spot ratio, serum albumin of 2.9 g/dl, and serum creatinine of 2.54 mg/dl. At the most recent follow-up, approximately 3 weeks after initiation of corticosteroids, creatinine remained elevated at 3.74 mg/dl, with 24-hour urine protein of 18.8 g/d (Figure 2).

This is the second report of the onset of minimal change disease occurring within a week of an initial dose of the Pfizer-BioNTech vaccine. The first report was of a 50-year-old healthy man who developed lower-extremity edema 4 days after injection, followed rapidly by anasarca and acute kidney injury, with serum creatinine of 2.3 mg/dl and urine protein of 6.9 g/d on admission.[1] He responded to steroid therapy with complete remission.[1]

The strong temporal association with vaccination in both cases suggests a rapid T cell–mediated immune response to viral mRNA as a possible trigger for podocytopathy. Acute onset of minimal change disease has also been reported in a 65-year-old woman and a 44-year-old man at 4 and 18 days, respectively, following the influenza vaccine.[2,3] Although definitive causality is difficult to establish, greater awareness of this potential adverse effect of vaccination is needed to