Nephrotic syndrome following COVID-19 vaccination – descriptive analysis of a global case series using VigiBase

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Introduction

Podocytopathies are kidney diseases characterised by podocyte injury, such as minimal change disease, focal segmental glomerulosclerosis, IgA nephropathy, and membranous glomerulonephropathy. Nephrotic syndrome often occurs as the presenting symptom of these conditions. Several vaccines have sporadically been described as potential triggers for nephrotic syndrome[1]. The publication of several cases in the literature as well as the absence of the description of renal adverse reactions in the vaccine information datasheet[2–5] triggered an investigation.

Methods

Reports for the Medical Dictionary for Drug Regulatory Activities Preferred Term "Nephrotic syndrome" with COVID-19 vaccines as suspected substances were extracted from VigiBase, the WHO global database of individual case safety reports on 14 February 2022, and analysed clinically case-by-case.

Results

At extraction, there were 513 reports for nephrotic syndrome in VigiBase. After semi-automated de-duplication 356 reports from all continents remained for analysis. Sixty-eight percent (n=242) of cases were reported as serious. The outcome was reported in 61% of cases (n=218). More patients were reported as recovered or recovering (n=113; 52%) than not recovered at the time of reporting (n=100; 46%). Five patients (2.0%) had a fatal outcome.

In 195 reports (55%) information on new onset or relapse were available. More cases of new onset (n=127) than relapse (n=68) were reported.

Relapse occurred more frequently following the first dose with a median time-to-onset (TTO) of nine days (interquartile range 3 to 17) as opposed to new onset cases which occurred more often following dose two with a median TTO of 10 days (interquartile range 4 to 27) irrespective of vaccine type or dose number.

Fifty-eight percent of patients in the new onset group (36 cases) were reported as recovered or recovering. This was similar in the relapse group (59%, 29 cases). However, in 91 out of 127 cases of new onset, and 37 out of 68 cases of relapse, the outcome was unknown or not recovered at the time of submission and there were two fatal cases in the relapse group. New onset and relapse cases are compared in Table 1.

Characteristics	All cases n=356 (100%)**	New onset n=127 (100%)**	Relapse* n=68 (100%)**
Sex N(%), Male	187 (53)	72 (56)	38 (56)
Median age [years] (IQR)	46 (28–65)	43 (29–62)	39 (23–31)
Vaccine dose N (%), 1st	110 (45)	33 (40)	33 (62)
Vaccine dose N (%), 2nd	125 (51)	48 (59)	17 (32)
Vaccine dose N (%), 3rd	10 (4.1)	1 (1.2)	3 (5.7)
Vaccine dose N (%), Unknown	111	45	15
TTO (days), median (IQR)	9 (3–20)	10 (4–27)	9 (3–17)
TTO Unknown N (%)	24 (6.7)	14 (11)	7 (10)

TTO=time-to-onset; IQR=interquartile range
*Focal segmental glomerulosclerosis n=2, focal segmental glomerulosclerosis with nephrotic syndrome n=1, minimal change disease n=12, minimal change disease with nephrotic syndrome n=17, nephrotic syndrome n=31, stable membranous glomerulonephritis n=2, nephritis n=1, lupus nephritis n=2.
**Percentages are calculated after excluding the cases with missing information for that characteristic

Table 1. Cases of new onset nephrotic syndrome compared to relapse cases following COVID-19 vaccination in VigiBase, as of 14 February 2022

Conclusions

In the case series analysed here there were fewer relapses of nephrotic syndrome than new onset following COVID-19 vaccination. Relapse occurred more often following the first vaccine dose than new onset, which more frequently occurred after dose two. To confirm this observation further studies are needed.

References/further sources of information

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