

Figure 1: Clinical characteristics of COVID-19 associated kidney injury.

(A) Patients developing kidney injury after SARS CoV-2 infection;

(B) Patients with aggravated renal insufficiency after SARS CoV-2 infection.

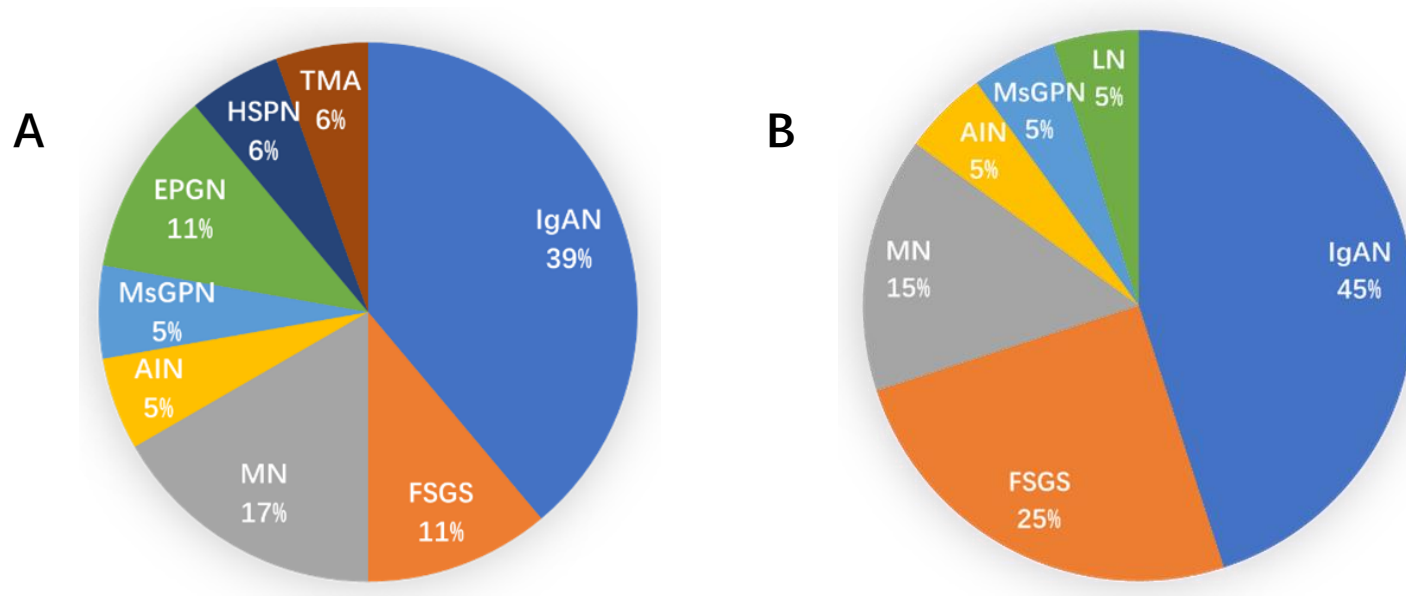


Figure 2: Pathological features of COVID-19 associated kidney injury

(A)patients developing kidney injury after SARS CoV-2 infection

(B)patients with aggravated renal insufficiency after SARS CoV-2 infection

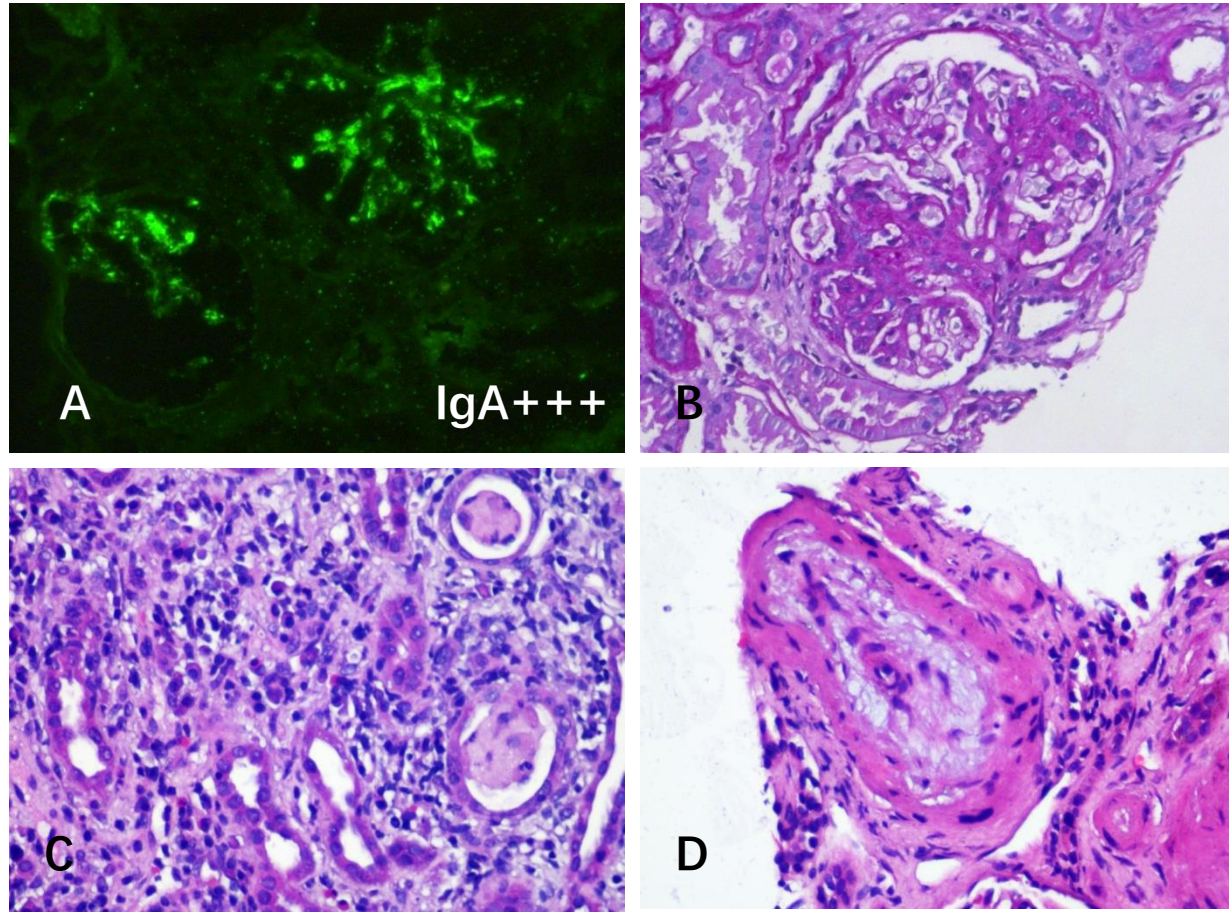


Figure 3:Renal Pathological changes in patients with COVID-19 associated kidney injury
 (A)Patient with IgAN shows IgA+++ deposite in glomerulas (IF $\times 100$),
 (B)Patient with IgAN shows segmetal sclerosis and mild mesangial proliferation (PAS $\times 200$),
 (C)Patient with interstitial nephritis shows Interstitial inflammatory cell infiltration (HE $\times 200$),
 (D)Patient with TMA shows arteriole intima edema and myxoid degeneration (HE $\times 200$).

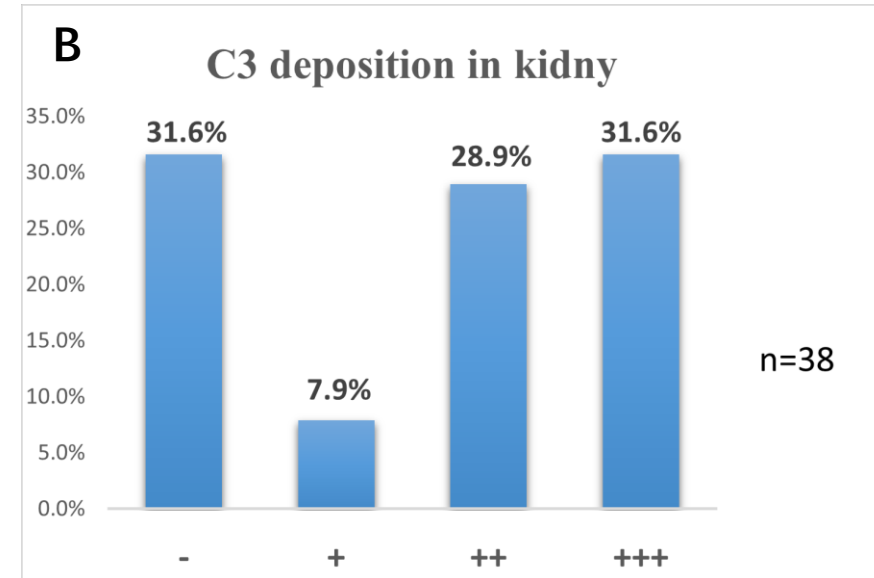
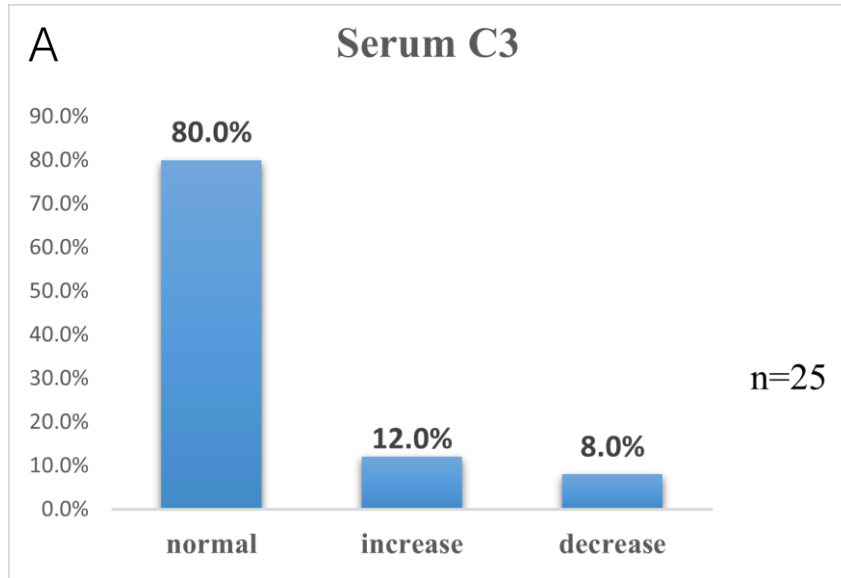


Figure 4. Serum C3 and deposition of C3 in patients with COVID-19 associated kidney disease.

(A) Serum C3 levels: normal: 0.70~1.40g/L; increase: >1.40g/L; decrease: <0.70g/L;

(B) Intensity of C3 deposition by Immunofluorescence staining in renal tissue.

Table 1A: Kidney Pathology Findings and Clinical Presentation of Patients in Group A

| Case | Pathology | Age | Sex | Kidney presentation | Scr (umol/L) | Proteinuria (mg/d) | SN-RBC | Alb (g/L) | Hb (g/L) | C3 (g/L) | C4 (g/L) | Outcome | | | | |
|------|-----------|-----|-----|-------------------------|--------------|--------------------|---------|-----------|----------|----------|----------|-------------|-----------|-----------|------|------|
| | | | | | | | | | | | | Proteinuria | Hematuria | Scr | C3 | C4 |
| 1 | IgAN | 28 | F | CKD | 78.0 | 677.55 | 725000 | 46.7 | 117 | 1.25 | 0.34 | PR | PR | Stable | - | - |
| 2 | IgAN | 56 | M | CKD | 154.0 | 2842.85 | < 8000 | 17.6 | 143 | - | - | PR | Increase | Increased | - | - |
| 3 | IgAN | 42 | F | CKD | 182.3 | 1023.00 | 72000 | 39.8 | 92 | - | - | PR | PR | Increased | - | - |
| 4 | IgAN | 35 | F | Proteinuria | 48.0 | 3.20 | 9000 | 39.4 | 131 | 0.89 | 0.21 | - | - | - | - | - |
| 5 | IgAN | 36 | F | NS | 55.7 | - | 108000 | 38.0 | 130 | 1.19 | 0.41 | - | - | - | - | - |
| 6 | IgAN | 37 | M | NS | 270.8 | 9354.00 | 9000 | 38.0 | 156 | 1.16 | 0.24 | NR | Stable | Decreased | - | - |
| 7 | IgAN | 41 | F | CKD | 66.0 | 642.90 | 45000 | 45.4 | 122 | 1.24 | 0.25 | PR | Increased | - | - | - |
| 8 | MN | 33 | F | Hematuria + Proteinuria | 66.8 | 2829.00 | 275000 | 15.4 | 134 | 1.13 | 0.3 | - | - | - | - | - |
| 9 | MN | 46 | M | NS | 83.8 | 12456.80 | 326000 | 20.2 | 160 | - | - | NR | Stable | Stable | - | - |
| 10 | MN | 60 | F | NS | 72.0 | 12059.60 | 105000 | 30.6 | 125 | 1.46 | 0.51 | - | - | - | - | - |
| 11 | FSGS | 18 | M | NS | 82.0 | 25568.00 | 10000 | 20.5 | 165 | 1.16 | 0.33 | - | - | - | - | - |
| 12 | FSGS | 17 | M | NS | 75.0 | 4776.50 | < 8000 | 21.1 | 176 | - | - | NR | Stable | Stable | - | - |
| 13 | EPGN | 47 | F | Hematuria + Proteinuria | 45.7 | 272.30 | 300000 | 26.0 | 118 | 2.59 | 0.63 | PR | PR | - | 2.14 | 0.62 |
| 14 | EPGN | 18 | M | Proteinuria | 55.0 | - | 189000 | 24.9 | 121 | 0.28 | 0.18 | NR | PR | Increased | 1.03 | 0.21 |
| 15 | HSPN | 59 | M | HSP | 84.0 | 2084.80 | 45000 | 35.1 | 147 | 1.06 | 0.26 | NR | Increased | - | - | - |
| 16 | MsPGN | 44 | F | NS | 72.0 | - | 1800000 | 30.2 | 122 | 1.15 | 0.2 | Increased | PR | - | - | - |
| 17 | TMA | 39 | M | AKI | 306.9 | 457.30 | < 8000 | 40.5 | 124 | 1.06 | 0.28 | PR | Increased | Increased | - | - |
| 18 | AIN | 20 | M | Proteinuria | 141.9 | - | <8000 | 37.8 | 102 | 1.80 | 0.41 | PR | stable | Stable | 1.70 | 0.41 |

PR: Partial Remission; NR: No Remission; R: Remission

Table 1B: Kidney Pathology Findings and Clinical Presentation of Patients in Group B

| Case | Pathology | Age | Sex | Kidney presentation | Ser (umol/L) | Proteinuria (mg/d) | SN-RBC | Alb (g/L) | Hb (g/L) | C3 (g/L) | C4 (g/L) | Outcome | | | | |
|------|-----------|-----|-----|---------------------|--------------|--------------------|--------|-----------|----------|----------|----------|-------------|-----------|-----------|------|------|
| | | | | | | | | | | | | Proteinuria | Hematuria | Scr | C3 | C4 |
| 1 | IgAN | 34 | M | CKD | 44.5 | 908.30 | 45000 | 45.3 | 155 | 1.21 | 0.29 | PR | Increased | - | - | - |
| 2 | IgAN | 37 | F | CKD | 82.0 | 6254.40 | 15000 | 37.6 | 125 | - | - | PR | Increased | - | - | - |
| 3 | IgAN | 29 | F | CKD | 113.0 | 555.00 | 18000 | 42.8 | 110 | - | - | NR | Stable | Stable | - | - |
| 4 | IgAN | 24 | M | CKD | 89.0 | 1017.00 | 225000 | 37.6 | 139 | - | - | NR | PR | - | - | - |
| 5 | IgAN | 38 | M | CKD | 69.0 | - | 826000 | 38.4 | 136 | - | - | PR | PR | Stable | - | - |
| 6 | IgAN | 49 | M | CKD | 309.9 | 2360.50 | 27000 | 227.5 | 112 | 0.99 | 0.20 | NR | Increased | Decreased | - | - |
| 7 | IgAN | 30 | M | CKD | 127.0 | 343.30 | 306000 | 43.7 | 136 | 1.06 | 0.18 | - | - | - | - | - |
| 8 | IgAN | 63 | F | NS | 254.2 | 6408.00 | 65000 | 17.9 | 88 | 0.95 | 0.21 | PR | PR | Decreased | - | - |
| 9 | IgAN | 42 | F | CKD | 69.2 | 364.80 | 125000 | 41.8 | 122 | 1.02 | 0.26 | PR | PR | Stable | - | - |
| 10 | FSGS | 16 | M | NS | 85.8 | 6717.81 | < 8000 | 17.6 | 143 | - | - | - | - | - | - | - |
| 11 | FSGS | 27 | F | CKD | 71.0 | 727.90 | 225000 | 41.8 | 1120 | 1.08 | 0.29 | - | - | - | - | - |
| 12 | FSGS | 29 | M | NS | - | 2577.90 | < 8000 | 26.3 | 137 | 1.07 | 0.23 | R | Stable | - | - | - |
| 13 | FSGS | 50 | M | NS | 69.6 | 4614.00 | 32000 | 17.0 | 125 | - | - | - | - | - | - | - |
| 14 | FSGS | 51 | F | CKD | 155.0 | - | 495000 | 41.2 | 128 | 1.18 | 0.21 | - | PR | Stable | - | - |
| 15 | MN | 60 | M | NS | 219.0 | 4773.61 | < 8000 | 20.5 | 65 | - | - | NR | Increased | Decreased | - | - |
| 16 | MN | 26 | M | NS | 186.0 | 9498.00 | < 8000 | 27.9 | 92 | 0.80 | 0.20 | NR | Stable | Decreased | - | - |
| 17 | MN | 50 | M | NS | 62.0 | 3274.10 | 315000 | 27.2 | 126 | - | - | - | - | - | - | - |
| 18 | AIN | 65 | M | CKD | 248.0 | 511.00 | < 8000 | 41.5 | 117 | 0.54 | 0.03 | PR | Stable | Decreased | 0.79 | 0.25 |
| 19 | MsPGN | 53 | M | NS | 608 | 7148.2 | - | 18 | 108 | 1.25 | 0.54 | - | - | - | - | - |
| 20 | LN | 28 | M | SLE | 80.0 | 779.00 | 90000 | 36.0 | 151 | - | - | NR | PR | - | - | - |