# Demographic, clinical characteristics and treatment outcomes of C3 glomerulopathy in China: A nationwide retrospective cohort study

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**Backgrounds**: As a rare glomerular disease, there is limited data on the demographic, clinical characteristics, and treatment outcomes of C3 glomerulopathy (C3G) in China.

**Methods**: Patient medical records were retrospectively collected from 24 regional central hospitals across China, from 2013 to 2021. Descriptive analysis was performed on clinical characteristics, treatment, and outcomes. $\chi^2$ test was performed to analyze the difference between children and adult groups.

**Results**: 470,000 patients with chronic kidney disease (CKD) were enrolled, of which 102 patients were C3G confirmed by renal biopsy. Among them, 9 were diagnosed with dense deposit disease and 93 were diagnosed with C3 glomerulonephritis. At the time of diagnosis, 46.2% of C3G patients had an eGFR<60 ml/min/1.73m$^2$, 47.1% had low serum complement C3, 48.8% had low serum C4, 22.5% had abnormal blood/urine protein electrophoresis, and 3% had elevated serum globulin. Besides C3 deposition, 4.9% and 12.7% of patients combined IgA and IgG deposition in pathological immunofluorescence, respectively. Compared to children, adult patients tended to present severe symptoms at diagnosis (Table 1). 55 patients (53.9%) received treatment with RASI, while 48 (47.1%) patients received glucocorticoids and 24 patients combined glucocorticoids with other immunosuppressants (cyclosporine, etc.). 16 patients were followed up for more than one year. Among them, 2 patients showed ≥40% decrease in eGFR from baseline, and 3 patients developed end stage renal disease (ESRD) within one year.

**Conclusion**: C3G has heterogeneous clinical characteristics, and adult patients presented more serious symptoms at diagnosis. Gaps are identified for C3G patients standardized treatment in China, and targeted therapy is urgently needed.

Table 1. Baseline characteristics of patients with C3G stratified by age.

| Characteristics | Children (N=43) | Adult (N=59) | P |
|---|---|---|---|
| Demography | | | |
| Age | 8.9 (6.1-11.2) | 42.1 (29.4-53.8) | <0.001 |
| Male, n (%) | 24 (55.8) | 29 (49.2) | 0.642 |
| Clinical symptoms | | | |
| Hypertension, n (%) | 1 (2.3) | 18 (30.5) | 0.001 |
| Proteinuria, n (%) | 25 (58.1) | 45 (76.3) | 0.083 |
| Massive proteinuria*, n (%) | 12 (27.9) | 32 (54.2) | 0.014 |
| Hematuria, n (%) | 17 (39.5) | 8 (13.6) | 0.005 |
| Laboratory tests | | | |
| Creatinine(μmol/L) | 40.5 (34.0-56.0) | 101.0 (78.5-180.8) | <0.001 |
| eGFR (ml/min/1.73m$^2$) | 164.1 (147.4-178.1) | 66.0 (33.9-95.6) | <0.001 |
| 24-hour urine protein quantification (g) | 0.27 (0.09-0.75) | 2.14 (0.59-4.53) | <0.001 |
| Serology detection-C3 (g/L) | 0.76 (0.57-0.98) | 0.76 (0.52-0.86) | 0.367 |
| Serology detection-C4(g/L) | 0.18 (0.14-0.27) | 0.22 (0.16-0.27) | 0.146 |

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|---|---|---|---|
| Treatment | | | |
| Renin-angiotensin system inhibitor, n (%) | 19 (44.2) | 36 (61.0) | 0.138 |
| Glucocorticoid, n (%) | 25 (58.1) | 23 (39.0) | 0.087 |
| Heparin Disaccharides, n (%) | 17 (39.5) | 7 (11.9) | 0.003 |

eGFR, estimated glomerular filtration rate.

*Massive proteinuria defined as urinary protein qualitative ≥3+ or UACR >300mg/g or 24-hour urinary protein qualitative >3.5g.