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Outcome of membranoproliferative glomerulonephritis (MPGN) and C3 glomerulopathy stratified by new classification

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Objectives: The new classification of MPGN has been suggested based on immunofluorescence (IF). Immune complex (IC) deposition precedes the complement activation in IC-MPGN and C3 glomerulopathy (C3G) is caused by spontaneous activation of alternative complement pathway. Additionally, recent reports showed there is a considerable overlap in the histopathology of postinfectious GN (PIGN) and C3G. Nevertheless, little is known about IC-MPGN and C3G.

Methods: A total of 4,351 patients who underwent kidney biopsy and had IF data were identified in Korea University Anam Hospital, SNUH, and SNUBH during 1980-2018. We included 150 subjects with MPGN and 69 with PIGN, and stratified by C3G. C3G was defined as C3 staining stronger than immunoglobulins on IF.

Results: Among patients with MPGN and PIGN, 19(12.6%) and 33(47.8%) were classified as C3G. C3G had younger age, lower C3, nephrotic range proteinuria and serum cholesterol, higher serum albumin although renal function was not different at the time of biopsy (P<0.05). In addition, C3G had almost no association with viral hepatitis and autoimmune markers: hepatitis B antigen (4.5%), ANA (6.2%), ANCA (0%) (P<0.05). C3G had lower incidence of 20% eGFR decline at 6 months (P=0.03). The 36% of MPGN and 15.9% of PIGN patients progressed to end stage renal disease (ESRD) during 13.8±0.8 years of mean follow up. C3G noted lower proteinuria and higher eGFR at last follow up (P<0.015). Both MPGN and C3G showed significant lower incidence of ESRD (IC-MPGN, 37.4%; C3G-MPGN: 26.3%, IC-PIGN; 22.2%, C3-PIGN, 9.1%; P<0.01). IC-MPGN or PIGN demonstrated 3.102-fold increased risk for ESRD than C3G (95% CI, 1.298-7.412). Mortality was not significant.

Conclusions: C3G had lower nephrotic range proteinuria and association with infection or autoimmune disease at presentation. The 26.3% and 9.1% of C3G progressed to ESRD in MPGN and PIGN although C3G showed favorable renal outcome compared than IC-MPGN.