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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 ($P\leq0.015$). Both MPGN and PIGN, 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.