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Use of C4d biomarker as a diagnostic tool to classify membranoproliferative glomerulonephritis

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Background: Membranoproliferative glomerulonephritis (MPGN type I, II, III) was reclassified in 2013 as MPGN and C3 glomerulopathy (C3G) based on classical or alternative pathway complement activation.

Objectives: To evaluate whether C4d, a component of the classical pathway could be a diagnostic tool in differentiating between MPGN and C3G.

Methods: We conducted a retrospective study of 15 MPGN type I, II, III and 13 minimal change disease (MCD) patients from 2000 to 2012. Formalin-fixed paraffin-embedded kidney tissues were stained for C4d using an immunoperoxidase method.

Results: Using the 2013 C3G consensus classification, the 15 MPGN types I, II, III biopsies were re-classified as MPGN (8) and C3G (7). Based on C4d immunohistochemical staining, of the 8 biopsies diagnosed as MPGN, 4 had classical pathway involvement [C1q (+), C3 (+), C4d (+)]; two had lectin pathway involvement [C1q (-), C3 (+), C4d (+)]; and, two were reclassified as C3G because the absence of C4d and C1q suggested the presence of the alternative pathway [C1q (-), C3 (+), C4d (-)]. Three of seven C3G biopsies presented classical pathway and were reclassified as MPGN. The alternative pathway was present in one of the other 4 considered to be C3G; the other two C3G biopsies likely involved the lectin pathway. The one case of dense deposit disease had lectin pathway involvement.

Conclusions: This study reports that C4d staining may help to differentiate between MPGN and C3G. In addition, the lectin pathway seems to play a role in the pathogenesis of these glomerulopathies.

Biography

Nirupama Gupta has completed her MD degree from the University of South Florida in 2009, Pediatrics Residency at Yale-New Haven Hospital in 2012 and Pediatric Nephrology Fellowship at University of Florida in 2015. Her clinical research interests include glomerulopathies, childhood hypertension and BK virus infection. As a Junior Faculty, she started the Pediatric Hypertension Clinic at University of Florida in 2015. She has given a CME talk on Pediatric Hypertension to community pediatricians and has lectured to medical students and residents on various nephrology topics

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