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Serum growth differentiation factor-15 predicts renal outcome in idiopathic membranous nephropathy

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Objectives : Idiopathic membranous nephropathy (IMN) is a common cause of nephrotic syndrome in adults. A biomarker to accurately represent the severity of IMN and predict long-term prognosis is lack. Growth differentiation factor-15 (GDF-15) is a member of the transforming growth factor-β superfamily and it could be a useful prognostic marker in patients with chronic inflammatory disease and heart disease. We evaluated the clinical significance of GDF-15 as a prognostic predictor of renal outcome in IMN.

Methods : A total 37 patients who had a biopsy-proven IMN in the Chungnam National University Hospital from January 2010 to December 2015 were included. Levels of GDF-15 were measured by the enzyme-linked immunosorbent assay. We divided the patients into 2 groups by serum GDF-15 levels: group 1 (lower than the median), group 2 (higher than the median).

Results : The mean GDF-15 concentration was 1,675.8±783.9 pg/ml. The serum GFR-15 level more than 2,160 pg/mL showed 75% sensitivity and 82% specificity to predict renal progression. Levels of GDF-15 were higher in the patients with nephrotic syndrome than in those with non-nephrotic range proteinuria ($P<0.001$). Initial estimated glomerular filtration rate and proteinuria tended to worsen as the levels of GDF-15 increased. Patients with mild to severe interstitial fibrosis (≥ 5%) have high levels of GDF-15 compared to those with none and minimal interstitial fibrosis (< 5%) ($p<0.007$). In Kaplan-Meier analysis, the risk of renal progression increased in the patients with high levels of GDF-15 compared with those with low levels of GDF-15 (63.2% vs 10.0%) ($p=0.004$).

Conclusions : Our results suggest that serum GDF-15 at initial diagnosis might be a valuable marker for identifying of the disease severity and predicting of the renal progression in the patients with IMN.

Keywords : Idiopathic membranous nephropathy, interstitial fibrosis, GDF-15