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Growth differentiation factor-15 as an independent predictor of idiopathic membranous nephropathy progression

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Objectives: Growth differentiation factor-15 (GDF-15) is a member of the transforming growth factor- β superfamily and has been associated with chronic inflammatory disease. It has the potential to be a useful prognostic marker in patients with renal diseases, such as diabetic nephropathy and IgA nephropathy. This study examined whether GDF-15 is associated with the clinical parameters in IMN and showed that GDF-15 can predict IMN disease progression.

Methods: A total 35 patients with biopsy-proven IMN, treated at Chungnam National University Hospital from January 2010 to December 2015, were included. Patients younger than 18 years of age, those with secondary membranous nephropathy and those lost to follow-up before 12-months were excluded. Levels of GDF-15 at the time of biopsy were measured using enzyme-linked immunosorbent assays. Disease progression was defined as a $\geq 30\%$ decline in estimated glomerular filtration rate (eGFR) or the development of end-stage renal disease.

Results: The mean follow-up was 44.1 months (range: 16–72 months). Using receiver operating curve analysis, the best serum GDF-15 cut-off value of for predicting disease progression was 2.15 ng/ml (sensitivity: 75.0%, specificity: 82.1%, $p = 0.007$). GDF-15 was significantly related to age and initial renal function. In the Kaplan-Meier analysis, the risk of disease progression increased in patients with GDF-15 ≥ 2.15 ng/ml when compared with those with GDF-15 < 2.15 ng/ml (50.0% vs 9.7%) ($p = 0.012$). In the multivariate Cox regression analysis adjusted for potential confounders, only GDF-15 was significantly associated with disease progression in IMN ($p = 0.032$).

Conclusions: In conclusion, the GDF-15 level at the time of diagnosis has a significant negative correlation with initial renal function and is associated with a poor prognosis in IMN. Our results suggest that GDF-15 provides useful prognostic information in patients with IMN.