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Galactose-deficient IgA1 as a biomarker of IgA nephropathy

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Objectives:

Development of new biomarkers of IgA nephropathy (IgAN) is needed for non-invasive diagnosis and establishment of proper treatment target. Recently, emerging evidence suggested galactose-deficient IgA1 (GdIgA1) as a pivotal molecule in the pathogenesis of IgAN. However, only few studies investigated the role of GdIgA1 as a biomarker in IgAN. In this study, we investigated clinical relevance of serum and urine GdIgA1 levels in patients with IgAN.

Methods:

Overall, 280 individuals were included in this study: 200 with biopsy-proven IgAN, 60 with non-IgAN glomerulonephritis, and 20 with healthy control. The levels of serum and urinary GdIgA1 were measured using ELISA kits in the samples obtained at the time of renal biopsy. Urinary GdIgA1 level was normalized to urine creatinine. We compared the levels of serum and urinary GdIgA1 according to the type of glomerular disease, and analyzed association of GdIgA1 levels with cliniopathological parameters in patients with IgAN. We then divided the IgA patients into three groups according to the GdIgA1 levels and compared clinical outcomes.

Results:

Both serum and urinary GdIgA1 levels in IgAN patients were significantly higher than in the healthy controls (8.58±4.38ug/ml vs. 4.25±1.82ug/ml, $p < 0.001$ and 1.45±1.21 ng/mlCr vs. 0.49±0.52ng/mlCr, $p < 0.001$, respectively). Compared with non-IgAN glomerulonephritis patients, IgAN patients showed higher levels of serum and urinary GdIgA1. In the patients with IgAN, serum GdIA1 levels correlated significantly with estimated glomerular filtration rate (eGFR). The urinary GdIgA1 levels showed significant correlation with eGFR, serum albumin, and urinary protein excretion. Cox proportional hazard models showed that high GdIgA1 levels were independent risk factors for chronic kidney disease progression after adjusting for several confounders.

Conclusions:

Our results suggested that serum and urinary GdIgA1 levels might be useful diagnostic and prognostic factors in IgAN patients. Further studies with large population and extended duration are needed.