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Association of podocyte autophagosome numbers with idiopathic membranous nephropathy and secondary membranous nephropathy

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Objectives : This study was to investigate the relation between the number of autophagosomes in podocytes and the syndromes of idiopathic membranous nephropathy (IMN) and secondary membranous nephropathy (sMN).

Methods : The pathological changes in the kidney tissuesof patients were detected with the hematoxylin and eosin staining, the periodic acid-Schiff reagent treatment, the Masson's trichrome staining and the immunofluorescence detection (IF). Meanwhile, the autophagosomesin podocyte were analyzed by transmission electron microscopy (EM) and the IF assay pointing to LC3-II, aautophagic marker. Clinical data, including age, sex, edema, serum creatinine, estimated glomerular filtration rate (eGFR), hematuria, urine protein excretion and serum albumin, were collected from in-patient medical records. Finally, the association of podocyte autophagosome numbers with idiopathic membranous nephropathy and secondary membranous nephropathy was studied.

Results : Fewer autophagosomes were observed in podocytes of nephropathy group compared with the control group. Moreover, there was a significant difference in the autophagosome number between the two types of MN and each kind of nephropathy demonstrated distinct characteristics. Although the reduced autophagosome number in the IMN cases was not related to sex, this trend was exacerbated along with the progression from pathological stage I to II. In contrast, fewer autophagosomes were observed in class II and V LN patients compared with the controls, while greater numbers were detected in class III and IV LN patients.

Conclusions : The results indicated that the autophagy participated in the podocyte injury in IMN and sMN and the number of autophagosomes in podocytes was related to the pathological classification.

Keywords : autophagosome; podocyte; idiopathic membranous nephropathy; secondary membranous nephropathy