CHANGES IN GLOMERULAR BASEMENT MEMBRANE COMPONENTS IN DIABETIC NEPHROPATHY

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To clarify the mechanism of progression of diabetic glomerulosclerosis, changes in glomerular extracellular matrix components were investigated.

MATERIALS AND METHODS: Indirect immunofluorescence staining with polyclonal antibodies to heparansulfate proteoglycan (HS-PG), laminin, type IV collagen and fibronectin were carried out on renal specimens from patients with diabetic nephropathy and streptozotocin diabetic rats. Fluorescence intensity and distribution in glomeruli were observed. The relationship between glomerulosclerosis, proteinuria and fluorescence intensity was also studied.

RESULTS AND DISCUSSION: HS-PG and laminin decreased in the capillary (Fig.1, Fig.2) and type IV collagen and fibronectin tended to increase in the mesangial area in diabetic patients. Especially HS-PG and laminin decreased in inverse proportion to the sclerosis grade (Fig.3). HS-PG also decreased in inverse proportion to proteinuria. In diabetic rats, laminin, type IV collagen and fibronectin tended to increase, but no significant difference was detected between diabetic rats and controls. No remarkable changes were observed in HS-PG. It seemed that morphological changes were not great enough to be detected by an immunofluorescent technique in diabetic rats, so no clear difference was seen. These results suggest that non-collagenous components such as HS-PG and laminin decrease in the capillary with progression of diabetic glomerulosclerosis. On the other hand, type IV collagen and fibronectin increase in the mesangial area or sclerosis region. Similar results have been reported, but no generally
Ikeda, S. et al: G&I components in diabetics accepted theory has been established. These changes seemed to play an important role in the progression of diabetic glomerulosclerosis.

Fig.1 HS-PG staining. A: Control. Linear IF staining of capillary. B: Diabetic glomerulus. Decreased IF staining of capillary. (X200)

Fig.2 Laminin staining. A: Control. Linear staining of capillary. B: Diabetic glomerulus. Decreased IF staining of capillary. (X200)

Fig.3 Changes in extracellular matrices and sclerosis grade. A: HS-PG, B: Laminin, C: type IV collagen, D: Fibronectin.

REFERENCES