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CD44 in glomerular parietal epithelial cells as a putative pathological marker of renal dysfunction in primary focal segmental glomerulosclerosis

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The search for risk factors for chronic kidney disease in children with Focal segmental Glomerulosclerosis(FSGS) is important to define prognosis and individualized treatment. This study investigated whether CD44-immunostaining in glomerular parietal-epithelial-cells(PEC) is a pathological marker of FSGS. In this retrospective study, 26 patients with FSGS and 37 patients with minimal-change disease(MCD), biopsied from 1985-2010, were evaluated. Immunohistochemistry for CD44 was performed in all cases. Patients were grouped according to the positivity or not for CD44 in PEC. As expected, no CD44-positive PEC was observed in MCD biopsies, suggesting that CD44-positive PEC could be a useful indicator of FSGS. Eight patients with FSGS presented CD44-positive PEC. Thus, we investigate whether CD44-immunostaining in PEC were associated with renal deterioration. Primary outcome was decline of estimated glomerular filtration rate(eGFR) of 50% or more. Median follow-up was 6.9years. Median renal survival was 14.5years and probability of a 50% decline of eGRF was 30% in 10years. Nine children exhibited primary outcome and 7 developed ESRD. In comparison to PEC-CD44-negative-patients(n=18), PEC-CD44-positive-patients(n=8) presented lower baseline eGFR(99±41 versus 141±44ml/min/1.73m2, p=0.035) and a significant decline of eGFR(-38.6±39.5 versus -5.6±25.3ml/min/1.73m2/year, p=0.018). No difference was observed in FSGS subtypes. Presence of CD44-staining in PEC was significantly associated with the decline of baseline eGFR of 50% or more. Renal survival was significantly reduced in PEC CD44-positive patients(3.8 versus 14.6 years in CD44-negative, p<0.05). Our findings indicated, for the first time, that the positivity for CD44 in PEC seems to be a pathological marker of renal function deterioration in patients with FSGS.

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