POLYCYSTIC KIDNEY DISEASE

Angiogenic growth factor level correlates with structural and functional changes in ADPKD

Autosomal dominant polycystic kidney disease (ADPKD) in children is characterized by renal cysts and renal volume expansion, often in the absence of renal dysfunction. A study has now demonstrated the potential role of angiogenic growth factors in the progression of cyst development and kidney dysfunction in these patients. "We are hopeful that our studies will ultimately result in new therapies for ADPKD, in particular interventions that will effectively slow renal disease progression in young patients," says corresponding author Berenice Reed.

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Previous evidence from other investigators suggested that angiogenesis may support the early structural changes that occur in patients with ADPKD. "We were motivated by elegant studies that presented evidence for angiogenesis on the surface of kidney cysts and by studies demonstrating the presence of angiogenic growth factors in fluid from both renal and hepatic cysts," explains Reed. "We hypothesized that altered expression of these angiogenic growth factors might occur in ADPKD."

The researchers studied the relationship between angiogenic growth factors and renal changes in 71 patients with ADPKD, aged 8–26 years. The researchers identified a positive correlation between serum levels of vascular endothelial growth factor (VEGF) and cyst and total renal volume as assessed by MRI. They also identified a negative relationship between serum VEGF level and creatinine clearance and a linear relationship between VEGF level and left ventricular mass index (LVMI). "The association between VEGF level and LVMI is of particular relevance as patients with ADPKD are at increased risk of left ventricular hypertrophy," explains Reed. "Identification of children at risk of cardiovascular complications is important because cardiac MRI and/or echocardiography are not routinely performed in young patients with ADPKD."

The researchers plan to extend their studies to adults with ADPKD and to investigate the VEGF decoy receptor, soluble VEGF receptor 1. They hope that future studies of angiogenesis in animal and cell models of ADPKD will unravel the molecular mechanisms involved.

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Original article Reed, B.Y. *et al.* Angiogenic growth factors correlate with disease severity in young patients with autosomal dominant polycystic kidney disease. *Kidney Int.* doi:10.1038/ki.2010.355