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POLYCYSTIC KIDNEY DISEASE

Glomerular hyperfiltration may be a risk factor for progression of ADPKD

The investigators of a new study have found that glomerular hyperfiltration (GH; defined as creatinine clearance ≥140 ml/min/1.73 m^2) is associated with a faster rate of renal function decline and an increased rate of kidney enlargement in children with autosomal dominant polycystic kidney disease (ADPKD). "GH combined with increased renal volume may be used as an early marker for more severe progression of ADPKD in children," says investigator Imed Helal.

ADPKD can develop in children and progress to end-stage renal disease over several decades. Identifying risk factors for progression could enable early intervention, when therapeutic agents are more likely to be effective. Previous researchers had proposed GH to be a potential early marker in the diagnosis of ADPKD.

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In this new study, 180 children (aged 4–18 years) with ADPKD were examined by renal ultrasound to determine renal volume and renal volume growth rate (increase in renal volume per year corrected for body surface area). Renal function was estimated using creatinine clearance calculated from serum creatinine concentration and urine creatinine levels.

Of the children who were assessed, 32 had GH and 148 had normal renal function. At baseline, children with GH had significantly lower serum creatinine levels, higher creatinine clearance and larger renal volumes than children without GH. However, after adjustment for age and sex, or when log10-transformed values were used, no relationship was found between baseline GH and kidney volume.

Follow-up data were available for 140 children. Over 5 years, patients with GH at baseline had an increased rate of kidney enlargement and faster decline in renal function than children without GH. Even after applying a more stringent definition of GH (creatinine clearance ≥150 ml/min/1.73 m^2), the results were similar.

The authors note that the renin–angiotensin–aldosterone system (RAAS) is stimulated in ADPKD, and angiotensin II may contribute to cyst growth (by increasing proliferation, inflammation, oxidant injury and fibrosis) as well as GH (by increasing glomerular efferent arteriole resistance). "A future interventional study could compare RAAS inhibition with placebo in patients with early ADPKD and GH," says Helal. "The rapid decline in glomerular filtration rate in patients with ADPKD and GH could be abolished or attenuated by RAAS inhibition."

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