Vasopressin-related copeptin is a novel predictor of early endothelial dysfunction in patients with adult polycystic kidney disease.

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ABSTRACT

Background: In this study, we examined the relative usefulness of serum copeptin levels as a surrogate marker of vasopressin (AVP) by correlating it with baseline and longitudinal changes in markers of both renal function and common CVD manifestations (hypertensive vascular disease, atherosclerosis and endothelial dysfunction) that accompany the progression of adult polycystic kidney disease (ADPKD).

Methods: We studied a cohort of young and otherwise healthy ADPKD patients (n=235) and measured cardiovascular function using flow-mediation dilatation (FMD), carotid intima media thickness (cIMT) and pulse wave velocity (PWV), as well as serum copeptin (commercial ELISA, a stable marker of AVP activity). The same analyses were carried out at baseline and after three years of follow-up.

Results: At baseline, median eGFR was 69 mL/min./1.73m^2, mean FMD 6.9±0.9%, cIMT 0.7±0.1 mm, and PWV 8.1±1.2 m/s. At follow-up, equivalent values were 65 (44-75) mL/min./1.73m^2, 5.8±0.9%, 0.8±0.1 mm. and 8.2±1.3 m/s. with all changes statistically significant. Plasma copeptin also rose from 0.62±0.12 to 0.94±0.19 ng/mL and this change correlated with ΔeGFR (-0.33, p<0.001), ΔFMD (0.599, p<0.001), ΔcIMT (0.562, p<0.001) and ΔPWV (0.27, p<0.001) also after linear regression modeling to correct for confounders (ΔAverage 24-h DBP, mmHg, ΔProteinuria, ΔcIMT, and ΔCRP,). Finally, ROC analysis was done for a high copeptin with ΔeGFR [cut-off:≤59], ΔFMD [cut-off: ≤7.08], ΔcIMT [cut-off:>0.76], ΔPWV, [cut-off:≤7.80] and at baseline predicted future change in FMD and cIMT.

Conclusions: Vascular dysfunction as reflected by FMD and cIMT, but not PWV or an altered cardiac geometry, precede most other signs of disease in ADPKD but is predicted by elevated levels of the circulating AVP-marker copeptin.

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