Increased FGF23 and Impaired Arterial Functions in Early Autosomal Dominant Polycystic Kidney Disease

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INTRODUCTION AND AIMS: Normotensive (NT) autosomal dominant polycystic kidney disease (ADPKD) patients with preserved kidney functions have left ventricular hypertrophy (LVH) and increased cardiovascular risk (CVR). Elevated levels of FGF23 have been linked to LVH and CVR. Recent studies report elevated levels of a in ADPKD. We investigated FGF23 levels in ADPKD patients and sought their association with arterial stiffness.

METHODS: 54 ADPKD patients with preserved renal functions and 26 healthy subjects were included. Arterial elasticity was assessed by applanation tonometry and serum FGF23 level (Immutopics) was measured. Comparison of the groups was performed with Student t or Mann Whitney U test and correlation analysis was done with Pearson or Spearman test according to normality of the parameters tested.

RESULTS: In the ADPKD group, 23 patients were hypertensive (HT) and using RAS blockers. The mean levels of FGF23 were higher in ADPKD patients compared to controls (Table 1). FGF23 levels were similar in HT-ADPKD and NT-ADPKD patients. Large and small vessel compliances (C1 and C2, respectively) were lower in the ADPKD patients compared to controls. NT-ADPKD patients (n=31) had lower C2 and tended to have lower C1 compared to controls (Table 1]. HT-ADPKD patients tended to have lower C1 snd C2 compared to controls. HT-ADPKD and NT-ADPKD patients had similar)arterial function values. There was no correlation between arterial elasticity parameters and FGF23 levels.

	Controls (n=26)	NT-ADPKD (n=31)	HT-ADPKD (n=23)	p*
Age (years)	35 (24-53)	28 (19-64)	44 (29-68)	NS, <0,001, <0.001
eGFR (ml/min/1.73m^2)	116.9±12.8	104.4±16.8	95.9±12	<0.001, <0.001, 0.045
FGF23 (RU/ml)	39.8 (4-82.6)	423.4 (65.3-1770)	333 (60.4-927.7)	<0.001, <0.001, 0.017
C1 (ml/mmHg×10)	14.8±5	12.1±4.3	12.8±4.3	0.037, NS, NS
C2 (ml/mmHg×100)	6.5 (2.8-15.7)	4.9 (1.6-10.2)	4.9 (1.8-11.8)	0.004, NS, NS

eGFR: estimated glomerular filtration rate, C1: large artery elasticity index, C2: small artery elasticity index, ADPKD: autosomal dominant polycystic kidney disease, NT: normotensive, HT: hypertensive, NS: not significant

* comparison between controls and NT-ADPKD, controls and HT-ADPKD, and NT-ADPKD and HT-ADPKD respectively

CONCLUSIONS: FGF23 was found substantially elevated and arterial compliance was found significantly decreased in early ADPKD patients regardless of hypertension. However there was no significant correlation between FGF23 levels and arterial function parameters. Additional studies are required to determine possible mechanisms of these disturbances and cardiovascular effects of FGF23 in ADPKD patients.

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