LEVELS OF ENDOCAN, ANGIOPOIETIN-2 AND HIF-1A IN PATIENTS WITH AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE AND DIFFERENT LEVELS OF RENAL FUNCTION

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INTRODUCTION AND AIMS: Endothelial dysfunction leading to unbalanced vascular constriction and ischemia of renal parenchyma is increasingly proposed as an additional pathway of renal damage in autosomal-dominant-polycystic-kidney-disease (ADPKD). However, human studies investigating the evolution of such phenomena are limited. This study investigated the levels of emerging biomarkers of endothelial function, angiogenesis and hypoxia, in ADPKD patients with different renal function.

METHODS: The study population consisted of three groups: 26 ADPKD patients with impaired renal function (Group A) (eGFR 45-70 ml/min/1.73m²), 26 ADPKD patients with preserved renal function (Group B) (eGFR >70 ml/min/1.73m²), and 26 age- and sex-matched controls with no history of renal disease. Circulating levels of endocan (endothelial cell-specific molecule-1), angiopoietin-2, and hypoxia-induced-factor-1a (HIF-1a) were determined by ELISA techniques.

RESULTS: Patients in Group A had significantly higher levels of endocan (7.17±0.43 ng/ml), angiopoietin-2 (5.593.43±3.390) and HIF-1a (163.68±37.84 pg/ml) compared to patients in Group B (6.86±0.59 ng/ml, p=0.017, 3.854.41±3.014.30, p=0.018, 136.84±42.10 pg/ml, p=0.019, respectively) or controls (4.83±0.69 ng/ml, 1.069±2.78 pg/ml, p<0.001 for all comparisons). Of note, patients in Group B had also higher levels of all markers compared to controls (p<0.001). However, having similar renal function. In correlation analyses within ADPKD patients, we noted strong correlations of all studied markers with ADMA (endocan r=0.908, p<0.001, angiopoietin2 r=-0.935, p<0.001 and HIF-1a r=-0.908, p<0.001), and only weak or modest correlations with eGFR. CONCLUSIONS: In conclusion, this study suggests that not only patients with low eGFR, but also those at early stages of the ADPKD had higher expression of markers indicative for endothelial dysfunction, angiogenesis and hypoxia in comparison to controls. These results could lead to the hypothesis that local microcirculatory changes may come early in the course of ADPKD and could be a cause rather than a result of disease progression and eGFR decline.