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ROLE OF URINARY NEPHRIN IN EARLY DETECTION OF SECONDARY NEPHROPATHIESIrena Kostovska¹¹Faculty of Medicine, Skopje, Republic of Macedonia

INTRODUCTION: Nephrin is specific podocyte protein which provide size selectivity of the glomerular filtration barrier. Damage of podocytes - podocytopathies, result in presence of nephrin in urine. Podocytopathies are important in pathogenesis of secondary nephropathies. Previously, microalbuminuria was considered as a gold standard in early detection of secondary nephropathies, particularly in early detection of diabetic nephropathy (DN), but the fact that microalbuminuria is nonspecific and nonsensitive marker, motivate us to find and research a novel biomarkers in early detection and prediction of secondary nephropathies. The main aim of the study is to test the significance of nephrin in early detection of DN and hypertensive nephropathy (HN) and in prediction of preeclampsia (PE).

METHODS: In this study were included 305 subjects, divided into four groups: 1. Subjects with type 2 diabetes mellitus (T2DM) (30 with nephropathy and 60 without nephropathy), 2. Subjects with chronic hypertension (CH) (30 with nephropathy and 54 without nephropathy), 3. Pregnant women (41 women with high risk pregnancy and 30 with PE) and 4. Healthy subjects (30 healthy subjects and 30 healthy pregnant women). In all subjects we measured: nephrin in urine with immunoenzyme assay, microalbumin and creatinine in urine with standard biochemical methods. We estimated the glomerular filtration rate (eGFR) by Cockcroft and Gault formula. We performed electrophoretic separation of urinary proteins by polyacrylamide gel. In blood sera, we measured a few standard biochemical parameters.

RESULTS: The percent of subjects with elevated levels of urinary nephrin was significant in all tested groups, but particularly is significant the fact that this percent is very high (82 %) in normoalbuminuric group of subjects with (T2DM), (66,7 %) in normoalbuminuric subjects with CH and (75,6 %) in group of women with high risk for development of PE. The concentration of urinary nephrin showed statistically significant differences between all groups of patients and healthy subjects ($p < 0.05$). In group with T2DM and group with CH we found statistically significant negative correlation between concentration of urinary nephrin and eGFR. In group of pregnant women with PE and group of high risk pregnant women with we found statistically significant positive correlation between concentration of urinary nephrin and gestational age. ROC analyses showed that nephrin has high discriminatory power between healthy subjects and subjects with DN, HN and PE. Electrophoretic separation of urinary proteins showed that in patient with T2DM the most frequent type of proteinuria was tubular proteinuria, while in other examined groups, the most frequent type was mixed proteinuria.

CONCLUSIONS: Nephrin can be a useful marker for early detection of DN and HN and in prediction of PE.