CROSS-SECTIONAL RELATIONSHIPS OF URINARY ALBUMIN EXCRETION WITH OSTEOPROTEGERIN, C-REACTIVE PROTEIN AND ASYMMETRIC DIMETHYLARGININE IN ESSENTIAL HYPERTENSION

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Background: Asymmetric dimethylarginine (ADMA) and osteoprotegerin (OPG), a key factor in vascular calcification, emerge as markers of cardiovascular risk. We investigated the relationships of urinary albumin excretion, expressed as the albumin to creatinine ratio (ACR), with OPG, high-sensitivity C-reactive protein (hs-CRP), and ADMA in essential hypertensives.

Methods: Our population consisted of 80 newly diagnosed untreated non-diabetics with stage I to II essential hypertension [57 men, mean age=50 years, office blood pressure (BP)=149/96 mmHg]. According to the ACR values determined as the mean of two non-consecutive morning spot urine samples, the study population was divided into microalbuminurics (n=19) (mean ACR=30-300 mg/g) and normoalbuminurics (n=61) (mean ACR<30 mg/g). Moreover, in all patients venous blood sampling was performed for estimation of OPG, hs-CRP and ADMA concentrations.

Results: Microalbuminurics compared to normoalbuminurics were older (52±7 vs 48±9 years, p<0.05) and had higher 24-h systolic BP (143±12 vs 132±11 mmHg, p<0.05), while did not differ regarding metabolic profile (p=NS for all). Moreover, microalbuminurics compared to normoalbuminurics exhibited higher OPG (5.4±0.5 vs 4.3±0.4 pmol/l, p<0.0001), hs-CRP (5.2±1.5 vs 2.1±0.8 mg/l p<0.0001) and ADMA levels (0.61±0.05 vs 0.55±0.04 μmol/l, p<0.0001). In the total population, ACR was correlated with 24-h systolic BP (r=0.340, p<0.0001), OPG (r=0.471, p<0.0001), hs-CRP (r=0.552, p<0.0001) and ADMA (r=0.370, p<0.0001). Furthermore, OPG was associated with age (r=0.225, p<0.05), 24-h systolic BP (r=0.281, p<0.0001), hs-CRP (r=0.330, p=0.004) and ADMA (r=0.285, p<0.05). Multiple regression analysis revealed that 24-h systolic BP, OPG and hs-CRP were the independent predictors of ACR (R²=0.53, p<0.001).

Conclusion: Microalbuminuric hypertensives exhibit pronounced inflammatory involvement and diffuse vascular dysfunction as reflected by increased OPG, hs-CRP and ADMA levels. Moreover, these findings suggest that OPG is implicated in proatherogenetic mechanisms related to albuminuria and further support that ACR is a tool to estimate vascular status in hypertension.