

Atherosclerosis and Inflammation

1.12 C-Reactive Protein is Associated with Aortic Stiffness Independently of Microalbuminuria in Essential Hypertension

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Introduction. Previous studies documented an association between microalbuminuria (MAU) and low grade chronic inflammation, expressed chiefly by elevated plasma levels of high-sensitivity C-reactive protein (HS-CRP). A link between both MAU and HS-CRP and an increased aortic stiffness has also been demonstrated. However, it has not been fully elucidated if the relationships of MAU and HS-CRP with aortic distensibility are independent from each other.

Aim. To evaluate the relationships of urinary albumin excretion rate (AER), HS-CRP and aortic stiffness in a sample of hypertensive patients without over renal insufficiency.

Methods. We enrolled 112 untreated non-diabetic essential hypertensive patients (mean age: 45 ± 11 years; males 68 %). In all subjects 24-hour AER and HS-CRP were determined by immunoenzymatic assay. Subjects with AER ≥ 20 $\mu\text{g}/\text{min}$ were considered microalbuminuric. Aortic stiffness was assessed by carotid-femoral PWV (c-f PWV) measurement using the Complior, a computerized device that allows on-line pulse wave recording and automatic calculation of PWV.

Results. C-f PWV values were higher in microalbuminuric subjects ($n = 46$) than in normoalbuminuric ones ($n = 66$) (11.8 ± 2.2 vs 10.1 ± 1.9 m/sec; $p < 0.001$) and in subjects with HS-CRP above the median value (1.8 mg/l) when compared to those with lower levels of HS-CRP (11.7 ± 2.3 vs 10 ± 1.8 m/sec; $p < 0.001$). These differences remained statistically significant even after adjustment for age, sex and mean blood pressure ($p < 0.001$ for MAU and $p = 0.038$ for HS-CRP). In a multiple regression model in which c-f PWV was considered as dependent variable, and age, gender, MAP, waist circumference, glycaemia, triglycerides, HDL cholesterol, total cholesterol and smoking habit were included as covariates, along with AER and HS-CRP, both these latter parameters remained independent predictors of aortic stiffness ($r = 0.24$; $p < 0.001$ and $r = 0.14$; $p = 0.026$, respectively).

Conclusions. Our study seems to suggest that in patients with essential hypertension both microalbuminuria and C-reactive protein are independently associated with an increased aortic stiffness. The strength of their associations with carotid-femoral PWV is greater for albumin excretion rate than for HS-CRP.