Relation between increased plasma viscosity and increased the body mass index (BMI) in hypertensive patients

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OBJECTIVE: Hypertension and obesity is associated with increased cardiovascular risk (CVR). Our study aimed to investigate possibility of plasma viscosity (PV) as a risk marker in hypertensive obesity patients and a factor that contribute to increase the CVR.

METHODS: We select 324 from 1200 consecutive patients (P) referred from January 2003 to April 2009. CVR factors (blood pressure, lipids, glucose, cigarette smoking, obesity) were evaluated by routine methods. PV were measured by a cone-plate viscometer. We divided the obese hypertensive patients (BMI < 25 Kg/cm²) in three groups according with the BMI: Group 1 – between 25 - 30 Kg/cm²; Group 2 – between 30 - 35 Kg/cm² and Group 3 – > 35 Kg/cm²

RESULTS: P with elevated BMI values had increased levels of PV (G1: 1.30 ± 0.10 cP, G2: 1.35 ± 0.10 cP and G3: 1.42 ± 0.11 vs.), p<0.001, and increased plasma fibrinogen levels (mg/ml) (G1: 287,50 ± 35,48, G2: 321,78 ± 34,29 and G3: 326,96 ± 29,73.), p<0.001). There is a relation between the levels of fibrinogen and PV (p<0,01). There also are a relation among the PV levels and cardiac parameters (left ventricular mass index) and interface media-intima of the carotid vessel.

CONCLUSION: The present investigation provides evidence that PV is increased in hypertensive subjects with elevated BMI values, independently of other CVR. This finding contributes to explain the high CVR of patients with obesity in hypertension and this market could be important in the determination of CVR.