Biomarkers of Endothelial Dysfunction and Coagulation Factors and Metabolic Changes in Individuals with Hypertensive Crisis

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Background: Hypertensive crisis (HC), characterized as sudden and symptomatic elevation in the blood pressure, with (hypertensive emergency- HE) or without (hypertensive urgency- HU) risk of target organ damage. Evidence shows that endothelial dysfunction and coagulation biomarkers are important in the pathophysiology of chronic high blood pressure (BP). **Objectives:** Characterize clinical and metabolic profile of HC presentation (HU and HE) and assess the participation of C-reactive protein (CRP), intercellular adhesion molecule (ICAM-1) and coagulation factors (PAI-1 and fibrinogen) in individuals with HC. **Methods:** We selected 274 individuals in a cross-sectional study: 74 normotensive (NT) and 74 controlled hypertensive subjects (CHT), 50 HU and 78 HE. Serum levels of coagulation factors and inflammatory proteins were analysis by MULTIPLEX technique, with level of significance. **Results:** Individuals with HE were older vs other groups ($p=0.0264$). Males were more frequent HU (54%). Values of systolic and diastolic blood pressure, and heart rate were higher in HC compared to CHT and NT. Blood glucose was higher in HE compared to NT ($p<0.0001$) and CHT ($p<0.033$) and in HU compared to NT ($p<0.0001$). Total cholesterol was higher in HU and HDL-c was significantly lower in HE compared to the NT ($p=0.0088$). Potassium levels were lower in HE compared to NT, CHT and HU ($p=0.0118$, $p=0.036$ and $p=0.036$; respectively). CRP, fibrinogen and PAI-1 were significantly higher in individuals with HU and HE compared to NT and CHT group, except for ICAM-1. Logistic regression showed that CRP and fibrinogen were predictors for HC development with odds ratios of 2.6 (1.24-5.50) and 8.72 (4.07-18.68), respectively. **Conclusions:** HC individuals have metabolic abnormalities compared to controls. Biomarkers of endothelial dysfunction and coagulation factors are higher in HU and HE groups

compared to control groups. This suggests the role of endothelial dysfunction biomarkers and coagulation factors in the pathogenesis of acute hypertensive event.

Keywords: Hypertensive crisis, endothelial dysfunction, coagulation factors.