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Influence of circadian blood pressure pattern on left ventricular hypertrophy and thrombogenesis in hypertensive patients

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Introduction: Left ventricular hypertrophy (LVH) is the most common target organ damage in arterial hypertension (AH). Hence, the association of LVH and circadian rhythm of blood pressure (BP) is still under debate. Non-dipping circadian BP pattern increase risk of cardiovascular and cerebrovascular events that may be due to the abnormalities in blood coagulation and activation of thrombogenesis

Purpose: It is to proof hypothesis, that non-dipper hypertensive patients in comparison with dippers have an adverse blood coagulation and activated thrombogenesis, as well as more severe LVH.

Methods: 57 patients with AH and 17 controls with normal BP were included in the study. 24-hour ambulatory BP monitoring, cardiac ultrasound and examination of blood rheology, namely plasma and whole blood viscosity, fibrinogen concentration, platelet aggregation and adhesive activity was performed in all the patients according to the standard protocols. Written informed consent was obtained from all participants.

Results: Dipper pattern was revealed in 20 patients and non-dipping in 37 hypertensive patients. Non-dipper hypertensive in comparison with dippers had higher levels of fibrinogen concentration, plasma and whole blood viscosity, platelet aggregation, as well as adhesiveness ($P < 0.001$). The prevalence of LVH was markedly higher among non-dipper patients with AH than among those without this disease or dipper pattern.

Conclusion: Results of our study confirm the hypothesis, that non-dipper hypertensive patients in comparison with dipper hypertensive patients have statistically significant deterioration of blood rheology and have markedly higher prevalence of significant LVH. Hence, we can conclude that non-dipper hypertensive patients are markedly prone to the cardiovascular complications due to the significant LVH and high risk of thrombogenesis.

Recommendations: It is made for the doctors involved in AH management to check blood rheology besides the LVH assessment and ABPM for proper evaluation of a patient's potential risk and avoid possible CV complications.

Biography

Anna Rekhviashvili is currently working as a Cardiologist Chief of the Outpatients and Diagnostics department at Archangel St Michael Clinical Hospital and is leading Arterial Hypertension and Vascular Study Center, Tbilisi, Georgia. She completed her MD at Tbilisi State University, Georgia in 2002. She was Junior Doctor and PhD student from 2003-2008 at National Institute of Cardiology. She worked as a Cardiologist at Ivane Javakhishvili Tbilisi State University Hospital, Tbilisi, Georgia. She was Visiting Research Fellow at Continuum Heart Institute, Beth Israel Medical Center, Albert Einstein College of Medicine New York, New York in 2010 and Visiting Professor at AMC, Amsterdam, Netherlands in 2016. She is a member of many professional national and international societies in cardiology, hypertension and atherosclerosis. Her research interests include "Diurnal variation of blood pressure, endothelial dysfunction, micro- and macro circulation in hypertension. She has many publications in national and international journals.

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