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Clinical and functional predictors that cause a decrease of indicators of morning blood pressure profile in antihypertensive telmisartan-based therapy

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History

- Received: May 27, 2020
- Accepted: Aug 19, 2020
- Published: Sep 30, 2020

DOI: 10.15419/bmrat.v7i9.630



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ABSTRACT

Background: Blood pressure (BP) monitoring is an important aspect in the treatment of arterial hypertension (AH), namely the morning BP increase which is associated with an increased risk of cardiovascular and cerebrovascular incidents as well as sudden death. The study herein revealed clinical and functional predictors which decrease the morning BP rise in the case of optimal antihypertensive therapy with telmisartan, based on results of daily blood pressure monitoring (DBPM). **Methods:** A single-center open-label study in parallel groups was conducted. The study included 50 patients with AH who had previously received antihypertensive therapy but did not achieve a reduction in BP according to DBPM. Telmisartan (40 - 80 mg per day) was added to the treatment regimen of all patients. All patients underwent a general clinical examination, measurement of glucose and creatinine levels, assessment of lipid profile, ECG recording in 12 leads, echocardiography (EchoCG), and DBPM before treatment and after 12 weeks of treatment. Statistical data analyses were performed. **Results:** Twelve-week antihypertensive telmisartan-based therapy led to a decrease in mean systolic blood pressure (SBP) from 134.3 \pm 5.0 to 126.2 \pm 4.3 mm Hg (p = 0.008), and a decrease in mean diastolic blood pressure (DBP) from 79.8 \pm 1.5 to 73.0 \pm 1.4 mm Hg (p < 0.001). There was a decrease in the index of variability of DBP from 22.4 \pm 2.8 to 16 \pm 2.4 mm Hg (p < 0.001), and a decrease in the daily index of SBP from 15.7 \pm 4.7 to 13.1 \pm 4.7 mm Hg (p = 0.014). In the study, a connection was found between the decrease of the average morning index and the following indicators: presence of left ventricular (LV) hypertrophy on ECG, final diastolic size of the LV over 6.0 cm, LV ejection fraction below 52.3%, total cholesterol level over 5.5 mmol/L, LDL level greater than 3.3 mmol/L, and triglyceride level greater than 2.0 mmol/L. Conclusion: These values could be used as predictors of a decrease in the morning index during 12-week telmisartan therapy.

Key words: Arterial hypertension, ambulatory blood pressure monitoring, blood pressure, telmisartan, antihypertensive therapy

INTRODUCTION

It is well-known that blood pressure (BP) level has daily fluctuations in both healthy individuals and patients with varying degrees of arterial hypertension (AH). The daily BP profile is influenced by a large number of exogenous and endogenous factors, the most powerful of which are the hypothalamic-pituitary-adrenal systems, reninangiotensin-aldosterone systems, autonomic regulation, renal hemodynamics, endothelial and vasoactive peptides, emotional stress, physical activity, sleep patterns, and behavioral reactions^{1,2}.

In most people, BP rises rapidly after waking up in the morning and at the start of daily activity. BP has two main peaks — in the morning and afternoon. There is a decrease in BP during the night by 10-20% compared to the average values of systolic blood pressure

(SBP) and diastolic blood pressure (DBP) in the active period ¹. Monitoring of morning BP rise is an important aspect in the treatment of AH and prevention of cardiovascular complications. Uncontrolled morning BP is a sign of inadequate antihypertensive therapy, insufficient dosage of drugs, or use of short-acting drugs, and is detected in the majority of patients (from 17 to 60%) treated for hypertension, according to various studies².

At the same time, morning BP rise is associated with an increased risk (by 40%) of cardiovascular and cerebrovascular problems, and sudden death^{3,4}. Recent studies indicate other adverse effects of morning hypertension. Gong S. et al. established an association between morning BP increase and subclinical target organ damage, namely left ventricular myocardial mass increase, left atrial dilatation and thickening of the intima-media carotid artery complex; these

Cite this article : Rasputina L, Didenko D. **Clinical and functional predictors that cause a decrease of indicators of morning blood pressure profile in antihypertensive telmisartan-based therapy**. *Biomed. Res. Ther.*; 7(9):3985-3995.