



## Evaluation of the Influence of Selective Beta-Adrenoblockers on the Indicators of the Daily Arterial Pressure Profile in Patients Hypertension

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### ABSTRACT

Hypertension remains one of the urgent problems of medicine. Leading to the development of complications, arterial hypertension is accompanied by the development of structural and functional changes in the heart.

The study of insufficient reduction in blood pressure is important. At the same time, at present, using the method of daily monitoring of blood pressure, it has been established that with an insufficient nightly decrease in blood pressure, arterial hypertension is characterized by certain and very significant features of the course, prognosis and pathogenesis. At present, it seems quite reasonable to assume that in patients with uncomplicated hypertension and insufficient nocturnal BP reduction, the use of drugs with sympatholytic activity, that is, beta-blockers, may be especially effective.

### Keywords:

daily arterial pressure profile, patient, Bisoprolol, monotherapy

**The purpose of the study** was the study of ABPM indicators under the influence of beta-blockers.

**Material and research methods.** The study included 61 patients with stage II arterial hypertension; of these, 26 women and 35 men aged 33 to 67 years. Clinical observation lasted 12 weeks. BP was measured using the Korotkov method with the patient sitting and standing. All patients were prescribed the selective beta-blocker Bisoprolol. Bisoprolol was administered at an initial dose of 100 mg per day for 2 doses. With insufficient hypotensive effect after 2 weeks, the dose was increased by 50 mg per day to a maximum

dose of 200 mg per day. At the same time, patients underwent ABPM at baseline and at the end of treatment. We studied such indicators of ABPM as: average daily, average daily, average night values of systolic blood pressure, diastolic blood pressure; determination of BP variability. The normal level according to ABPM was less than 135/85 mm Hg. Art.

Initially and after Bisoprolol monotherapy in this group of patients, an echocardiographic study was performed and the main structural and functional indicators of central hemodynamics were determined.

**Results.** During therapy with Bisoprolol before and after treatment, there was a positive trend in ABPM. The hypotensive effect during therapy with Bisoprolol in the dose titration regimen developed gradually, the dynamics of office blood pressure and heart rate in patients with arterial hypertension who took Bisoprolol are presented in Table 1. After 12 weeks of treatment with Bisoprolol, the target blood

pressure level (less than 140/90 mm Hg. Art.) 16 people (26%) reached the office dimension. In 9 patients who did not achieve the target BP, at the office measurement, the mean BP in the sitting position decreased by 10 mm Hg. Art. and more. In general, during the treatment period, 21 patients required an increase in the dose of the drug to 200 mg per day.

**Table 1**

**Dynamics of blood pressure, heart rate in patients with hypertension on the background of bisoprolol therapy (p=61)**

Index	Initially	After 4 week.	After 8 week.	After 12 week.
SBP, mm Hg Art.	165,6±9,5	154,7±8,9	142,8±8,1*	134,3±7,4*
DBP, mm Hg Art.	94,2±5,6	95,9±5,2*	90,4±5,0*	84,0±4,6*
Heart rate, bpm/min	79,3±4,3	75,2±4,2	63,8±4,2*	64,8±4,1*

Прим

Note: \*p<0.05 compared to outcome

As can be seen from the data presented in the table, according to the results of office measurement of blood pressure as a result of treatment with bisoprolol, a significant decrease in systolic and diastolic blood pressure was achieved in the studied group of patients. BP, violations of the daily BP profile (Table 2).

**Table 2**

**ABPM indicators in hypertensive patients on the background of bisoprolol therapy (p=61)**

Parameters	Initially	After 12 week
Average SBP, mm Hg Art.	160,0±5,7	135,3±4,3*
Average DBP, mm Hg Art.	98,3±3,5	80,2±4,7*
Average daily SBP, mmHg Art. rt. Art. rt. Art.	168,6±5,8	139,5±11,7*
Average daily DBP, mmHg Art. rt. Art. rt. Art.	102,8±4,8	88,5±7,0*
Average night GARDEN, mmHg Art. rt. Art. rt. Art.	148,0±5,8	123,5±7,9*
Average nighttime DBP, mmHg Art. rt. Art. rt. Art.	92,5±3,4	79,7±5,1*
Average nighttime DBP, mmHg Art. rt. Art. rt. Art.	8,3±4,3	11,7±4,3*
SI GARDEN, %	11,8±4,6	17,8±4,0*
SI DAD, %	14,2±1,7	10,2±1,1*
Var DBP day, mm Hg Art.	26,2±1,8	13,2±2,8*
Var SBP days, mm Hg Art.	16,2±1,2	12,4±1,8*
Var DBP days, mm Hg Art.	16,7±1,1	11,4±1,8*
Var SBP n., mm Hg Art.	12,7±0,6	10,1±0,8*
	87±14	66±7,6*

Note: \*p< 0.05 - compared to outcome

In the study, all patients belonged to the group of increased BP variability (the critical indicator of mean daily BP variability was more than 15 mm Hg). According to the degree of nocturnal decrease in blood pressure, 47% of patients represented the category of dippers, 37% - non-dippers, 12% nightpickers and 4% hyperdippers. and diastolic blood pressure (Table 2). A significant decrease in the variability of systolic and diastolic blood pressure during the day and night hours was also registered, which was also more pronounced for daytime and night-time systolic blood pressure ( $p < 0.05$ ).

After 12 weeks of therapy with Bisoprolol, the daily index for systolic and diastolic blood pressure significantly increased by 40.3% and 43.8%, respectively, and therefore, in the group of patients examined, there were no patients with excessive nocturnal decrease in blood pressure. In 80% of patients in the nightpicker group, normalization of the circadian BP rhythm was registered, the proportion of patients with a normal circadian BP rhythm (dippers) reached 64.7% from 41.1% of the original.

Thus, the beta-blocker Bisoprolol has a high clinical efficacy in the treatment of patients with stage II hypertension. 12-week therapy with Bisoprolol allows you to maintain the target level of blood pressure, reduce the variability of blood pressure during the day and night, normalize the degree of nighttime decrease in systolic and diastolic blood pressure. When studying the dynamics of clinical symptoms, it was noted that after treatment, patients did not complain such as: pain in the precordial region, palpitations, interruptions in the work of the heart, anxiety and low mood.

The antihypertensive efficacy of Bisoprolol is determined by its pathogenetic mechanism of action, namely, a decrease in the pressor activity of the sympathetic part of the autonomic nervous system, which is manifested by a decrease in the concentration of norepinephrine, leading to a decrease in cardiac output and a decrease in total peripheral resistance. The result of these effects is the positive dynamics of systolic and

diastolic blood pressure during the day and night.

One of the most important properties of bisoprolol, revealed during the present study, is its effect on the variability of blood pressure during the day. The high variability of blood pressure that occurs in patients with hypertension is one of the risk factors for the development of various complications, including the LV myocardium. Therefore, the data obtained that bisoprolol during a 12-week intake significantly reduced the variability of systolic and diastolic blood pressure, both in the daytime and at night, testify in favor of the organoprotective effect of the drug, as well as the entire group of beta-blockers, by the standard of which he is a representative.

**Output.** Therefore, in patients with hypertension, bisoprolol for 12 weeks provides a decrease in the average values of systolic and diastolic blood pressure, as well as blood pressure variability in the daytime and at night.

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