

Clinical case

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CLINICAL CASE OF CHRONOTHERAPY OF ARTERIAL HYPERTENSION

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A clinical case of chronotherapy of arterial hypertension is described. In patient U., according to ambulatory blood pressure monitoring (ABPM) results, 24-h average value was 145 mmHg for systolic blood pressure (SBP) and 88 mmHg for diastolic blood pressure (DBP), DBP circadian rhythm had «over dipper» pattern while SBP circadian rhythm was normal. Taking into account the daily individual BP profile the patient was prescribed antihypertensive drug lisinopril 10 mg in the morning after waking up. As a result of the treatment, after 3 months the target BP levels were achieved, but SBP and DBP pattern have been transformed into «non-dipper» ones. The treatment regimen was modified: patient was recommended daily dose of lisinopril distributed into two doses-5mg in the morning and 5mg in the evening before going to bed with the subsequent control by ABPM in 3 months.

KEY WORDS: arterial hypertension, chronotherapy, ambulatory blood pressure monitoring

КЛІНІЧНИЙ ВИПАДОК ХРОНОТЕРАПІЇ ПРИ ГІПЕРТОНІЧНІЙ ХВОРОБИ

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Описано клінічний випадок хронотерапії при гіпертонічній хворобі. Пацієнтка У., середньодобовий артеріальний тиск (АТ) за даними добового моніторингу артеріального тиску (ДМАТ) 145/88 мм рт.ст., порушення добового ритму діастолічного артеріального тиску (ДАТ) по типу «overdipper», добовий ритм систолічного артеріального тиску (САТ) в межах норми. Пацієнтці рекомендовано час прийому антигіпертензивних препаратів з урахуванням добового індивідуального профілю АТ: лізиноприл 10 мг вранці після пробудження. У результаті проведеного лікування через 3 місяці досягнута нормалізація АТ, однак розвинулося порушення його добового ритму за типом «non-dipper» для САТ і ДАТ. У схему лікування внесені зміни: рекомендовано дозу препарату розподілити на два прийоми - 5 мг вранці і 5 мг ввечері перед сном з подальшим контролем методом ДМАТ через 3 місяці.

КЛЮЧОВІ СЛОВА: гіпертонічна хвороба, хронотерапія, добуве моніторування артеріального тиску

КЛИНИЧЕСКИЙ СЛУЧАЙ ХРОНОТЕРАПИИ ПРИ ГИПЕРТОНИЧЕСКОЙ БОЛЕЗНИ

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Описан клинический случай хронотерапии при гипертонической болезни. Пациентка У., среднесуточное артериальное давление (АД) по данным суточного мониторирования артериального давления (СМАД) 145/88 мм рт.ст., пограничное нарушение суточного ритма диастолического артериального давления (ДАД) по типу «overdipper», суточный ритм систолического артериального давления (САД) в пределах нормы. Пациентке рекомендовано время приёма антигипертензивных препаратов с учётом суточного индивидуального профиля АД: лизиноприл 10 мг утром после пробуждения. В результате проводимого лечения через 3 месяца достигнута нормализация АД, однако развилось нарушение его суточного ритма по типу «non-dipper» для САД и ДАД. В схему лечения внесены изменения: рекомендовано дозу препарата распределить на два приёма - 5 мг утром и 5 мг вечером перед сном с последующим контролем методом СМАД через 3 месяца.

КЛЮЧЕВЫЕ СЛОВА: гипертоническая болезнь, хронотерапия, суточное мониторирование артериального давления

INTRODUCTION

A timely diagnosis of arterial hypertension (AH) and subsequent adequate blood pressure (BP) control can prevent the development of complications, prolongate working age and increase the life expectancy in patients with hypertension[1]. Clinical studies have proven the effectiveness of BP monitoring (ABPM) both in the diagnosis of hypertension and assessment of the antihypertensive treatment efficacy [2-3].

ABPM data allow optimization the time of antihypertensive drugs administration, based on individual circadian blood pressure profile. However, in some cases, the achievement of target levels of blood pressure leads to the disruption of the circadian rhythm of blood pressure, which in turn also requires correction.

In this regard, it seems to us that a clinical case of a patient U. observed on the clinical base of our department is of great interest.

CLINICAL CASE

Patient U., female, 59 years old, complained of headaches in the occipital region on the background of increased blood pressure 160/90 mmHg, tinnitus, irritability, sometimes dizziness, flashing «flies» before the eyes.

No occupational hazards (university teacher, now retired), denies smoking and alcohol abuse. Living conditions are satisfactory; she has an active lifestyle by daily walking for 60 minutes.

She has been suffering arterial hypertension for 10 years. She occasionally takes beta-blockers, calcium channel blockers, angiotensin-converting-enzyme (ACE) inhibitors. At the time of admission she was taking enalapril 5mg 2 times a day, without a significant effect. BP was still within the ranges 150-160/90-100 mmHg according to home BP monitoring data.

Anamnesis vitae was unremarkable.

On physical examination the patient's height was 165 cm, weight 66 kg, BMI 24,2 kg/m². Data of heart, lungs and abdomen examination were unremarkable. According to the results of laboratory tests changes in the full blood count and urinalysis were not found. Biochemical

blood analysis (fasting plasma glucose level, lipid profile, serum potassium and sodium, uric acid and creatinine levels with estimation of GFR) revealed: total cholesterol plasma level of 5 mmol/L; other results were unremarkable. Results of ultrasonography of the kidneys and adrenal glands were within norm. Echocardiography revealed moderate hypertrophy of the left ventricle, ejection fraction of 64 %. 12-lead ECG was unremarkable.

ABPM was performed on the fifth day after enalapril withdrawal. The ABPM results confirmed the presence of hypertension (tab. 1-2, fig. 1). Average daily BP was 145/88 mmHg: awake BP was 150/92 mmHg, and asleep BP was 128/73 mmHg which exceeded the normal values [3]. The SBP circadian rhythm was normal (physiological reduction in SBP during the nighttime was within normal ranges) and DBP circadian rhythm had «overdipper» pattern.

Furthermore, a study of quality of life using the SF-36 revealed decline in almost all scales of the questionnaire (tab. 3).

Based on these data the following diagnosis was formulated:

Arterial hypertension II degree, stage 2. Heart failure, I stage with preserved left ventricle systolic function, I functional class. Moderate additional cardiovascular risk.

Prescribed treatment:

1. Diet low insalt, animal fat, easily digestible carbohydrates and rich in fibers.
2. Physical activities at the maintenance level.
3. Lisinopril 10mg once daily. Taking into account the individual BP profile, the patient was recommended to take the drug in the morning immediately after waking up.

After 3 months due to the treatments regimen the patient's condition was significantly improved: headaches regressed, overall health status and mood were improved, the quality of life increased for 5 and more units (tab. 3).

Repeated ABPM confirmed the achievement of target BP levels (tab. 1, fig. 2). But despite the blood pressure levels normalization its circadian rhythm has been changed. Physiological «dipper» pattern of SBP and «overdipper» pattern of DBP have been transformed into «non-dipper» ones.

Table 1

ABPM indices

Indices	Baseline	3 months later
SBP, daily mean, mmHg	145	127
SBP, awake mean, mmHg	150	127
SBP, asleep mean, mmHg	128	127
SBP time index, %	83,2	30,4
Awake SBP variability, mmHg	15,1	11,9
Asleep SBP variability, mmHg	16,2	6,9
DBP, daily mean, mmHg	88	79
DBP, awake mean, mmHg	92	80
DBP, asleep mean, mmHg	73	74
DBP time index, %	76,9	51,3
Awake DBP variability, mmHg	12,5	9,2
Asleep DBP variability, mmHg	8,3	4,1
The sleep-time SBP decline, %	14,7	0,5
The sleep-time DBP decline, %	21,4	7,3
Pulse pressure daily mean, mmHg	57	48

Table 2

Hours after awakening

Indices	Baseline	3 months later
morning SBP surge value	54 mmHg	59 mmHg
morning DBP surge value	48 mmHg	51 mmHg
morning SBP surge velocity	24 mmHg/h	- 39 mmHg/h
morning DBP surge velocity	38 mmHg/h	6 mmHg/h

Table 3

Health-related quality of life (in points by SF-36 scale)

Health concepts	Items	Baseline	3 months later
physical functioning	PF	85	90
role limitations because of physical health problems	RP	50	100
bodily pain	P	100	100
general health perceptions	GH	70	82
Physical Component Summary	PCS	52,63	59,65
vitality (energy/fatigue)	VT	70	65
social functioning	SF	87,5	87,5
role limitations because of emotional problems	RE	100	100
general mental health	MH	60	40
Mental Component Summary	MCS	50,64	45,22

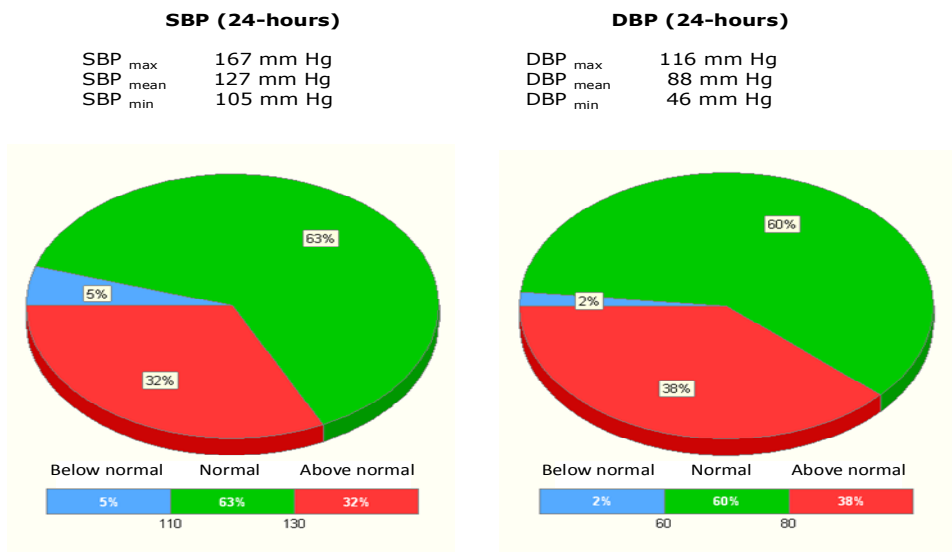


Fig.1 Average daily blood pressure at baseline

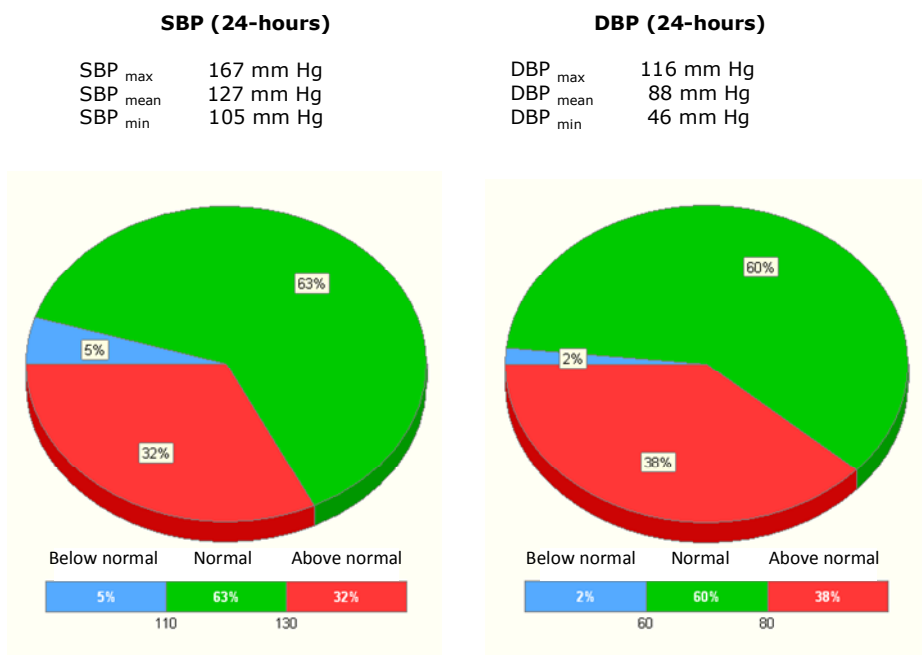


Fig.2 Average daily blood pressure 3 months after the start of treatment

For correction arisen BP circadian rhythm the patient was recommended to divide daily dose of lisinopril into two dosages: 5mg in the morning and 5mg in the evening at bedtime with the subsequent control APBM in 3 months.

The data obtained as a result of the above modification of the dosing regimen will be presented later.

Thus, in the treatment of patients with arterial hypertension, it is important not only to

achieve the target BP levels, but also to preserve its physiologic circadian rhythm. ABPM allows performing comprehensive chronobiologic analysis of BP profile in patient real-life conditions that in turn allows following the strategy of chronotherapy—optimizing treatment in accordance with the obtained data about the daily BP fluctuations and variability.

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