

Determination of the Biological Status of Arterial Hypertension to Chronotype Determination

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Abstract The present study analyzed the effectiveness of chronotherapy of arterial hypertension in hypertension based on the determination of the human chronotype. The result of the studies showed that the 28-day chronotherapy oriented to the chronotype of blood pressure is more effective than the traditional prescription of antihypertensive drugs without taking into account temporary circadian rhythms.

Keywords Arterial hypertension, Blood pressure, Pressure monitoring, Chronotype

1. Introduction

Arterial hypertension remains one of the leading problems of modern cardiology. This is due to the widespread prevalence of this disease and its role in the development of cardiovascular complications, mortality, temporary or permanent disability and deterioration in the quality of life [1]. Morbidity Arterial hypertension in our country has become an epidemic for a number of reasons [7]. The high prevalence of arterial hypertension and risk factors for cardiovascular diseases is facilitated by the insufficient education of the population on health issues and its defining conditions, and low awareness of the presence of the disease [9].

Arterial hypertension is the most common cause of severe cardiovascular complications cardiovascular complications and mortality in patients due to the widespread prevalence of the disease and insufficient control of blood pressure blood pressure, even in patients with mild arterial hypertension. As a result of many multicenter studies completed in recent years, it has been shown that only "strict" blood pressure pressure control can significantly reduce the frequency of cardiovascular complications in patients with arterial hypertension [1,2]. A promising and affordable alternative can be the use of a chronotherapy approach that can improve the effectiveness of treatment with non-traditional antihypertensive drugs. chronotherapy of arterial hypertension can achieve a stable clinical effect at an earlier time, with lower doses of drugs and better tolerability than with their traditional administration without taking into account the circadian rhythm of blood pressure [3,4].

Treatment of arterial hypertension by chronotherapy compared to the traditional method is effective not only in

terms of preventing complications such as myocardial infarction, stroke, but also in terms of economic benefits for the patient in particular, for practical health care in General. In this regard, there is a need to introduce the method of chronotherapy with the definition of chronotypes in the practice of a doctor. The method of chronotherapy using daily blood pressure monitoring (Smad) has long been proven and used all over the world. But, unfortunately, this method is not always available, and the Smad device is not available everywhere. A number of studies using Smad have shown that daily fluctuations in pressure occur depending on chronotypes [3,5]. The relationship between the type of daily working capacity and exposure to diseases has long been noticed. Individuals with morning chronotypes are more likely to have cardiovascular diseases than those with evening chronotypes. According to the results of Smad, the features of the morning dynamics of blood pressure in patients with arterial hypertension, depending on the daily biorhythm, were revealed. If we consider the picture of the morning dynamics of blood pressure as a blood pressure, we can note the trend of growth of all indicators in patients from evening to morning biorhythm. The morning dynamics of BLOOD pressure in patients with morning biorhythms has higher rates of changes in the speed and amplitude of BLOOD pressure, compared with the indicators of patients with evening biorhythms [6,7]. The average rate of morning rise of SAD in patients with evening biorhythms is statistically significantly less than the rate of rise of SAD in patients with intermediate and morning biorhythms. According to the authors (Tsybulskaya N. Yu., Polikarpov L. S., Petrova M. M., 2014), acrophases of median SAD, DBP, mean BP, and pulse in evening patients were recorded in the range from 16 h 16 min to 16 h 48 min [14 h 28 min - 17 h 41 min], and in morning patients - from 13 h 35 min to 14 h 05

min [12 h 00 min - 15 h 59 min] ($p < 0.05$) [3,5].

Based on the conducted studies, it was concluded that, despite the absence of the Smad method, using the determination of chronotypes in patients with arterial hypertension, it is possible to use chronotherapy as an effective treatment and prevention of CVD. Determination of chronotypes by the horn-Ostberg test will allow To determine indications for the appointment of antihypertensive treatment, to optimize the temporary mode of prescribing drugs.

The purpose of this study was to analyze the results of chronotherapy of arterial hypertension based on the determination of the chronotype using standard tests.

2. Materials and Methods of Research

The study was conducted at the faculty of advanced training of doctors of the Bukhara state medical Institute, on the basis of the Central multidisciplinary polyclinic. The study included 78 patients with arterial hypertension with grade I severity, low and medium risk of cardiovascular complications at the age of 28-56 years. The study included patients who independently applied for admission with first-time diarteric hypertension, diagnosed or untreated (irregular use of antihypertensive drugs is also considered untreated) essential arterial hypertension in the absence of concomitant severe somatic pathology (severe heart failure, severe bronchial asthma, etc.), requiring constant drug therapy, pregnancy, diabetes mellitus, menopause, and mental illness.

All patients were randomly assigned to 2 groups. In the study group (37 patients), drugs were prescribed on an outpatient basis according to the principle of chronotherapy, in the control group - by the traditional method (41 patients). All patients underwent a standard General clinical examination; questionnaire based on the international shortened horn-Ostberg questionnaire (1976); ECG. According to the horn-Ostberg questionnaire, only 3 chronotypes were identified: "intermediate" - (arrhythmic, pigeons), "larks" - morning type and "owls" - evening biorhythm. All patients on a "clean" background or after 3-day withdrawal of antihypertensive drugs were measured three times by office Adutrom and after 17.00, for 3 days. All

patients were prescribed a representative from the group of ACE inhibitors – lisinopril, the effect of which occurs in an hour, reaches a peak in 6-7 hours, and the hypotensive effect persists for 24 hours. The dose was selected individually and was 5-10 mg/day. Patients were asked to keep a diary, measure and indicate blood pressure in the morning and evening. Taking into account the data of many studies on the determination of acrophase of median SAD, DBP, average BLOOD pressure, pulse in patients of different types, "Owls" took the drug in the range from 9.00 to 10.00 hours, "Larks" at 22.00, "Pigeons" at 7.00-8.00 hours of the morning.

3. The Results of the Study and Their Discussion

When measured according to all the rules, the study and control groups with the traditional method were comparable in the values of office SAD and DBP, the Average age of patients was 51.2 ± 8.7 years, the average duration of the disease was 8.6 ± 6.6 years. In addition, there were no significant differences between the treatment groups by age, gender, duration of arterial hypertension, and baseline BLOOD pressure. The average values of office SAD/DB in the study and control groups were $149.3 \pm 9.4 / 94.1 \pm 4.9$ mmHg, respectively. and $148.3 \pm 8.1 / 95.7 \pm 4.3$. of all the respondents to the horn-Ostberg survey: arrhythmics-29 (37.1%), larks - 37 (48.4%), owls-12 (15.3%). Our data coincide with the literature data on the prevalence of chronotypes, as the number of owls decreases with age, and larks increases.

As mentioned above, "Owls" took the drug in the interval from 9.00 to 10.00 hours, "Larks" at 22.00, "Pigeons" at 7.00-8.00 hours of the morning. We analyzed the results of treatment with 28-day chronotherapy: in the study group, SBP decreased from 149.3 ± 9.4 mmHg to 113.7 ± 13.8 mmHg, by 23.8%, and in the control group – from 148.3 ± 8.1 mmHg to 119.3 ± 13.4 mmHg by 19.5%, DBP indicators decreased – from 94.1 ± 4.9 mmHg to 78.1 ± 8.4 mmHg by 17.0%, from 95.7 ± 4.3 mmHg to 80.6 ± 7.5 mmHg by 15.7%, respectively. At the same time, the average dose of lisinopril for both groups did not have significant differences.

Effectiveness of lisinopril depending on the method of administration

	Experimental group			Control group		
	before treatment	after treatment	difference %	before treatment	after treatment	Difference %
average. SAD	149,3	113,7	23,8	148,3	119,3	19,5
average. DAD	94,1	78,1	17,0	95,7	80,6	15,7

The results of studies have shown that 28-day chronotherapy focused on the chronotype of BLOOD pressure is more effective than traditional administration of antihypertensive drugs without taking into account

temporary circadian rhythms.

The use of chronotherapy has many advantages: high efficiency, shortening the course and reducing the cost of treatment, using medical procedures in smaller dosages,

reducing the risk of complications and side effects, etc. Determination of chronotypes using the horn-Ostberg questionnaire makes it possible to distinguish 3 chronotypes and assign hypotensive therapy to patients without Smad, taking into account the circadian rhythm characteristic of different chronotypes.

4. Conclusions

Additionally, the apparatus not always available in perichrom link of health care, requires a lot of time to evaluate the results. With the knowledge of the scientific literature and based on our research, we can say that chronotherapy, based on the ideas of biorhythmology, should be firmly established in medical practice and become one of the most important tools for optimizing the treatment of patients.

REFERENCES

- [1] Harper, D.C. Long-term neurodevelopmental outcome and brain volume after treatment for hydrops fetalis by in utero intravascular transfusions/ D.C. Harper [et al.]// Am. J. Obstet. Gynecol. – 2006. –Vol. 195. – P. 192-196.
- [2] McAdams RM. Time to implement delayed cord clamping. Obstet Gynecol 2014; 123: 549–52. 5. Garabedian C, Rakza T, Drumez E, Poleszczuk M, Ghesquiere L, Wibaut B, et al. Benefits of delayed cord clamping in red blood cell alloimmunization. Pediatrics 2016; 137: e20153236.
- [3] Boitsov S. A., Balanova Yu. a., shalnova S. A. and others. on behalf of the participants of the research ESSAY, the Russian Federation. Arterial hypertension among 25-64-year-olds: prevalence, awareness, treatment, and control. Based on the research ESSAY. Car-diovascular Therapy and Prevention. 2014; 13(4): 4-14.
- [4] Shalnova S. A., Balanova Yu. a., Konstantinov V. V. and others. Arterial hypertension: prevalence, awareness, use of antihypertensive drugs and effectiveness of treatment among the population of the Russian Federation// Russian journal of cardiology, 2006, Vol. 60, No. 4, pp. 45-50.
- [5] Tsybul'skaya N. Yu. Clinical and functional characteristics of arterial hypertension in patients with various circadian biological rhythms. Abstract for candidate of medical Sciences, 2012, Krasnoyarsk.
- [6] Gorbunov V. M., Feodorova E. Yu., Platonova E. V. Chronotherapy of arterial hypertension: current state of the problem. Rational pharmacotherapy in cardiology. 2017; 13(5). Pp. 706-710.
- [7] Tsybul'skaya N. Yu., Polikarpov L. S., Petrova M. M. Clinical and hemodynamic characteristics of patients with hypertension with various daily biorhythms. Siberian medical journal. 2013. Volume 28, No. 1.
- [8] Glutkin S. V., Chernysheva Yu. N., Zinchuk V. V. And others. Physiological characteristics of individuals with different chronotypes. Bulletin of the Smolensk state medical Academy. 2017; T16, No. 2. Pp. 48-57.
- [9] Schlarb A. A., Sopp R., Ambiel D., Grünwald J. Chronotype-related differences in childhood and adolescent aggression and antisocial behavior - a review of the literature / Chronobiology International. - 2014. - V. 31, N1. - P. 1-16.