Tuijin Jishu/Journal of Propulsion Technology
ISSN: 1001-4055
Vol. 44 No. 6 (2023)

Influence of Long-Term Use of Antihypertensive Drugs and the "Hypertension School" on the Development of the risk of Cardiovascular Complications in Patients with Arterial Hypertension

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Abstract: Purpose of the study. To study the effectiveness of long-term antihypertensive therapy and the impact of the educational program "School of hypertension" on the incidence of cardiovascular complications in patients with AH (arterial hypertension) I-II degree in a polyclinic.

Material and research methods. The study included 610 patients with 1–2-degree AH. The duration of AH was 6,8±1,6 years. Of the 610 patients examined, 231 (37,9%) were patients with stage I AH (mean age of patients was 46,7 ± 7,0 years) and 379 (62,1%) with stage 2 AH (mean age 49,1 +6,92 years). Patients with grade 1 hypertension started taking 5 mg of enalapril per day as monotherapy (Enap, KRKA, Slovenia). Patients with grade 2 hypertension were divided into 2 groups based on risk stratification. Group 1 (medium risk) took 10 mg of enalapril per day, group 2 (medium and high risk) took a fixed combination - Enap HL.

Results and discussion of the obtained results. Analysis of the results of the study showed that after 4 weeks of taking enalapril, there was a decrease in blood pressure from 158,2±6,5/96,1±4,9 to 152,2±7,1/93,1±5,9 mm Hg. Art. ($p<0,001$), the target BP level was reached by 22% of patients. At the same time, in the group taking Enap HL, blood pressure decreased from 159,6 ± 6,4 / 97,5 ± 3,8 to 145,4 ± 8,7 / 92,4 ± 7,1 mm Hg. Art. ($p<0.0001$). With Enap HL therapy, 58% of patients reached the target level of blood pressure. After 24 weeks of observation, blood pressure in patients taking Enap was 13,6±9,3/83,1±6,8 mm Hg. Art. and 137,5±9,0/87,9±7,3 mm Hg. Art. in patients taking Enap HL ($p<0,05$).

Conclusion. The use of an integrated approach - training patients with hypertension according to the educational program "school-hypertension" along with taking antihypertensive drugs, timely detection and monitoring of groups of people with a high and very high total cardiovascular risk of death using the SCORE scale helps to increase the effectiveness of therapeutic and prophylactic measures for hypertension and CVD (cardiovascular diseases).

Key words: *Arterial hypertension, "school of hypertension", antihypertensive therapy.*

1. Introduction

Arterial hypertension (AH) affects >1 billion people, 30-45% of the world's population. With the aging of the population, an increase in the prevalence of obesity, a sedentary lifestyle and other risk factors (RF), by 2025 a significant increase in the prevalence of hypertension in the world is expected, by 15-20%, up to 1,5 billion people. High blood pressure (BP) is the world's leading risk factor for premature death, which in 2015 led to ~10 million deaths, incl. to 4,9 million deaths due to coronary heart disease (CHD) and 3,5 million due to stroke [1]. AH is the leading risk factor for the development of cardiovascular diseases (CVD): CHD, myocardial infarction (MI), heart failure (HF), atrial fibrillation (AF); renal: chronic kidney disease (CKD); cerebrovascular diseases: cognitive dysfunction, stroke, transient ischemic attack (TIA), and peripheral arterial disease [1, 2]. Recommendations on the diagnosis and management of patients with various diseases have become firmly established in modern medical practice, the purpose of which is to give the doctor “a guiding thread in the sea of modern research” and thereby improve the diagnosis and treatment of diseases, increase the duration and improve the quality of life of patients [3, 4]. In connection with important studies in recent years, in 2017, the Recommendations for the Diagnosis and Treatment of AH were reissued by the American College of Cardiology (ACC) and the American Heart Association (AHA) [5]. Following them, the European Society of Cardiology - European Society of Cardiology (ESC) and the European Society of Hypertension - European Society of Hypertension (ESH) also updated the recommendations on hypertension [1, 6]. In accordance with the ESC/ESH 2013 recommendations, the benefits of AGT are due to a decrease in blood pressure as such, regardless of which drugs are prescribed for this. For mono- and combination therapy of hypertension were recommended: diuretics, including thiazide, thiazide-like - chlorthalidone, indapamide; β-blockers (β-AB); calcium channel blockers (CCBs); angiotensin-converting enzyme inhibitors (ACE inhibitors); angiotensin receptor antagonists (ARA); other antihistamines are direct renin inhibitors, centrally acting drugs, α-blockers [7]. In certain clinical situations, it was proposed to give preference to certain classes of antihistamines [7]. In accordance with the ESC/ESH 2018 recommendations, the mainstay of hypertension therapy should be drugs that have proven in randomized clinical trials the ability to reduce blood pressure and the risk of developing CV events: ACE inhibitors, ARBs, β-blockers, CCBs, and thiazide/thiazide-like diuretics [1]. In accordance with the recommendations of the ESC/ESH 2013, with low and moderate CV risk and a slight increase in blood pressure (AH 1 degree), it was recommended to start MT with monotherapy. In patients with high and very high risk, as well as with a pronounced increase in blood pressure (AH 2-3 degrees), a combination of 2 antihistamines of any class was immediately offered, except for a combination of ACE inhibitors and ARA [7]. This is a combination of kidney dysfunction and hyperkalemia. The ESC/ESH 2018 guidelines suggest that most patients should be treated immediately with a combination of two drugs rather than monotherapy. One of the components of the combination should be an ACE inhibitor or ARA, the second - a CCB or a diuretic. Monotherapy should only be considered in patients with low CV risk in grade 1 hypertension, in patients >80 years of age, or in frail patients [1]. The ACC/ANA 2017 is also recommended in adults with grade 2 hypertension and mean BP ≥20/10 mmHg. above the target BP, prescribe AHT with two drugs of different classes from the first line, either as separate drugs or as a fixed combination [5]. Monotherapy of hypertension is appropriate in patients with stage 1 hypertension, followed by dose titration or the addition of other drugs to achieve target blood pressure [5].

Purpose of the study. To study the effectiveness of long-term antihypertensive therapy and the impact of the educational program "School of hypertension" on the incidence of cardiovascular complications in patients with AH I-II degree in a polyclinic.

2. Material and research methods

The study included 610 patients with 1–2-degree hypertension, observed in a 37-family polyclinic in Tashkent. The study included patients aged 35–65 years with newly diagnosed hypertension or not regularly taking antihypertensive drugs during the last month. During the study of patients, a complete history was taken, a physical examination was performed, blood pressure was measured using the Korotkov method. To assess the risk of CVD over 10 years, the SCORE scale was used, developed as a result of cohort studies on 205,178 patients over 10 years in 12 European countries, including Russia. Using the questionnaire, risk factors for hypertension (hereditary predisposition for hypertension, bad habits: smoking, alcohol, overweight, excessive salt intake) were identified. Body mass index (BMI) - Quetelet index: calculated using the formula weight (kg) / height (m). The duration of AH was 6,8±1,6 years. 46 Of the 610 patients examined, 231 (37,9%) were patients with stage I AH (mean age of patients was 46,7 ± 7,0 years) and 379 (62,1%) with stage 2 AH (mean age 49, 1 + 6,92 years). Patients with grade 1 hypertension started taking 5 mg of enalapril per day as monotherapy (Enap, KRKA, Slovenia). Patients with grade 2 hypertension were divided into 2 groups based on risk stratification. Group 1 (medium risk) took 10 mg of enalapril per day, group 2 (medium and high risk) started taking enalapril 12.5 mg with hydrochlorothiazide fixed combination - Enap HL. After 4 weeks if the target level of blood pressure was not reached (<40/90 mm Hg), the dose of Enap was doubled (20 mg / day). If monotherapy with enalapril did not allow reaching the target level of blood pressure, then after 2 weeks. Enap HL was added to the treatment. A decrease in DBP by 10% or SBP by 10 mm Hg was taken as the criterion for the effectiveness of antihypertensive therapy. Art. at 15 mm Hg. Art. from the original level. The target level of blood pressure during therapy was considered to be the achievement of blood pressure <140/90 mm Hg. Art. [4,5]. All patients who achieved the target level of blood pressure or an adequate antihypertensive effect (a decrease in systolic blood pressure (SBP) and / or diastolic blood pressure (DBP) by less than 10% of the baseline) after 6 weeks of treatment continued to participate in the study for another 24 weeks. At all visits, patients were monitored for blood pressure, heart rate, patient complaints were recorded, side effects and adverse events, if any, were noted, a biochemical blood test (glucose, cholesterol, AST, ALT) and electrocardiography (ECG) in 12 leads were performed initially and after 12, 24 weeks of treatment. The exclusion criteria were secondary forms of hypertension, acute cerebrovascular accident, acute myocardial infarction within the last 6 months, angina pectoris II–III FC, heart failure, cardiac arrhythmias, liver and kidney dysfunction.

3. Results and discussion of the obtained results

BP control is a key tool in achieving the main goal in the treatment of hypertension - reducing the risk of developing cardiovascular complications and improving prognosis. Recent studies examining the effectiveness of various classes of antihypertensive drugs in preventing the risk of cardiovascular complications and death from them have shown that treatment with antihypertensive drugs (AHP) of any group reduces the risk of cardiovascular complications and death from them. The antihypertensive drugs used should have a prolonged action, providing adequate control of blood pressure during the day with a single dose. Many studies completed in recent years have shown that only strict control of blood pressure can significantly reduce the incidence of cardiovascular complications - MI, stroke, CHF in patients with hypertension. Based on the results of these studies, target levels of blood pressure were determined. According to the recommendations of the European Society of Cardiology, the target blood pressure level is recognized as blood pressure values not exceeding 140/90 mm Hg. Art. Analysis of the results of the study showed that after 4 weeks of taking enalapril, there was a decrease in blood pressure from 158,2±6,5/96,1±4,9 to 152,2±7,1/93,1±5,9 mm Hg. Art. ($p<0,001$), the target BP level was reached by 22% of patients. At the same time, in the group taking Enap HL, blood pressure decreased from 159,6 ± 6,4 / 97,5 ± 3,8 to 145,4 ± 8,7 / 92,4 ± 7,1 mm Hg. Art. ($p<0,0001$). With Enap HL therapy, 58% of patients reached the target level of blood pressure. As a result, after 12 weeks of treatment, blood pressure in the Enap HL group was significantly ($p<0,05$) lower (130,9±7,2/82,1±6,7 mm Hg) than in the group taking Enap (137,9±8,4/89,5±6,9 mm Hg). After 24 weeks of observation, blood pressure in patients

taking Enap was 130,6±9,3/83,1±6,8 mm Hg. Art. and 137,5±9,0/87,9±7,3 mm Hg. Art. in patients taking Enap HL (p<0,05). Assessment of the total risk of death from CVD is currently a reliable tool for determining the probability of fatal events in the next decade and managing risk. This methodology makes it possible to easily and reliably form groups of moderate, high and very high total risk, to differentiate treatment and prevention tactics for managing and monitoring these groups of people, which, of course, improves the effectiveness of control. Analysis of the results of the study showed that among the examined patients, the occurrence of CVC in patients with AH of the 1st degree with a high risk of 16,9%, with a very high risk of 1,7%, and in patients with AH of the 2nd degree, this condition was 33% and 12,4 % respectively. The results of the study showed that 14,5% of patients with hypertension aged 40-49 years are at high risk. The number of patients with high risk increases with age: at the age of 50-54 years, the risk increases by 2 times, at the age of 55-60 years, the risk increases by 2,8 times. Most women with CVD are at low risk for mortality within 10 years. Among men with hypertension, there is a negative predisposition, for example: in patients with grade 1 hypertension, a high risk was detected in 28,7% of patients and this figure is higher than in women by 2,9. In men, a very high risk was 4,6%, and this rate was not observed among women. In men with grade 2 hypertension, a high risk of death from CVD was observed in 45,5% of patients, which is 1,7 times more and more often than in patients with grade 1 hypertension. In men with 2-degree AH, a very high risk was observed in 15,8% of patients, this figure is 1,6 times higher than in women (P<0,05) and, when compared with patients with 1 degree AH, 2,4 times more. Increasing therapeutic and preventive measures for hypertension and CVD, timely identification of groups of people with a high and very high risk of death, makes it possible to detect CVD in time. When analyzing the results of taking antihistamines at week 24, we see a decrease in CVE risk indicators, from very high risk by 1,5, and due to this, the number of patients with low risk increases by 1,7, from 40,6% to 66,1%.

Along with this, we can register a reduction in high risk by 1,9. This indicator decreased from 26,9% to 13,7%. As a result of taking AGP, there is a decrease in blood pressure and HCM by 14,5%, which led to a decrease in CVD. An assessment of the final indicators associated with the degree of BP reduction showed that in the group of patients with 1 degree of AH who took AHD for 24 weeks, the risk index decreased from very high, by 2,1, and due to this, the number of patients with low risk increased (Fig. 1).

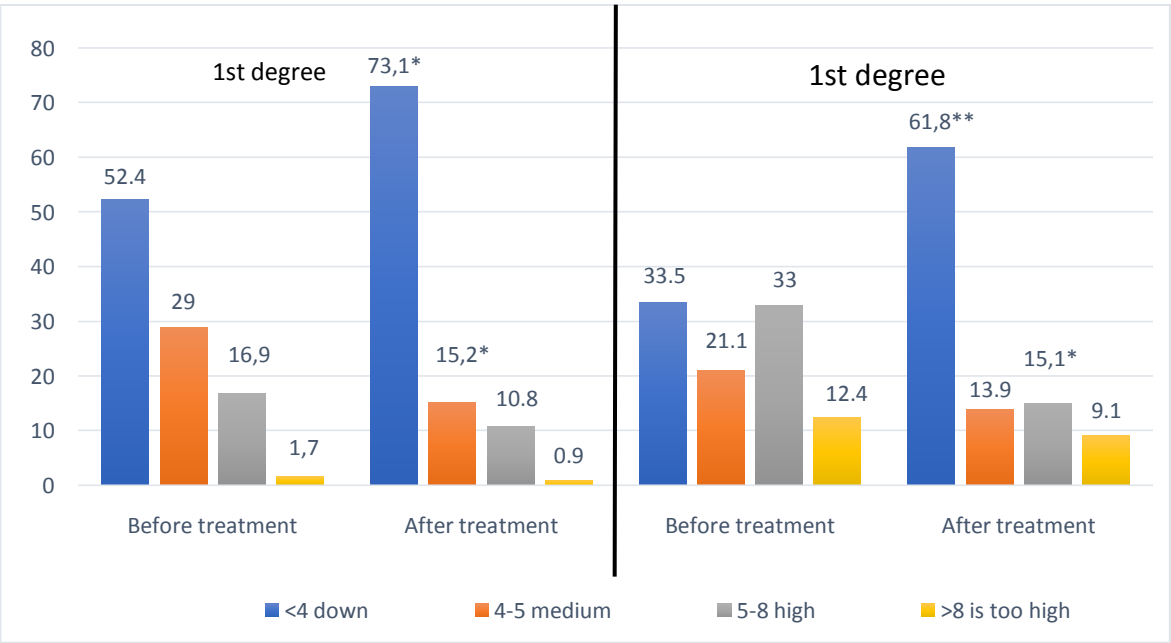

Figure 1. Dynamics of CVC risk indicators in patients with I-II degree of AH taking antihypertensive drugs

Note: * - (* - P<0,05; **-P<0,01).

If before treatment this figure was 1,7%, then after AGP it was 0,9% and the number of patients with low risk, from 121 (52,4%) rose to 163 (73,1%). In this group of patients, the high risk of CVC decreased by 5-8%, from 16,9% of patients before treatment is 10,8% of patients. Similar dynamics was observed in patients with stage 2 AH; during treatment for 24 weeks, a very high risk of cardiovascular events remained in 9,1% of patients, and amounted to 47 patients before treatment, after treatment it amounted to 34 patients. This, in turn, led to an increase in low-risk patients from 127 (33,5%) to 234 (61,8%). Risk indicators of CVC were also studied in 204 patients studying at the "school of hypertension". The results showed that in this group of patients, after training, the number of patients with a very high risk decreased (from 15 patients to 8) and this risk was 7,4% versus 3,9%. This was characterized by an increase in the number of patients with low risk: the number of patients in this group increased (from 52 to 125 patients), from 25,5% to 64,1%. The number of patients with a high risk of CVC who studied in this group was 49 (24%) and amounted to 21 (10,8%) (Fig. 2).

In the development of CVD, the degree of BP and risk factors for AH are of great importance. Thus, the risk of death from CVD is associated with the degree of AH. When taking antihistamines and after training in the "school of hypertension" in patients with a very high-risk indicator, there is a clear tendency to move from a high-risk group to a low-risk group. The most obvious result of educating patients with hypertension is to increase patients' awareness of the disease, which creates the prerequisites for their active participation in the treatment process.

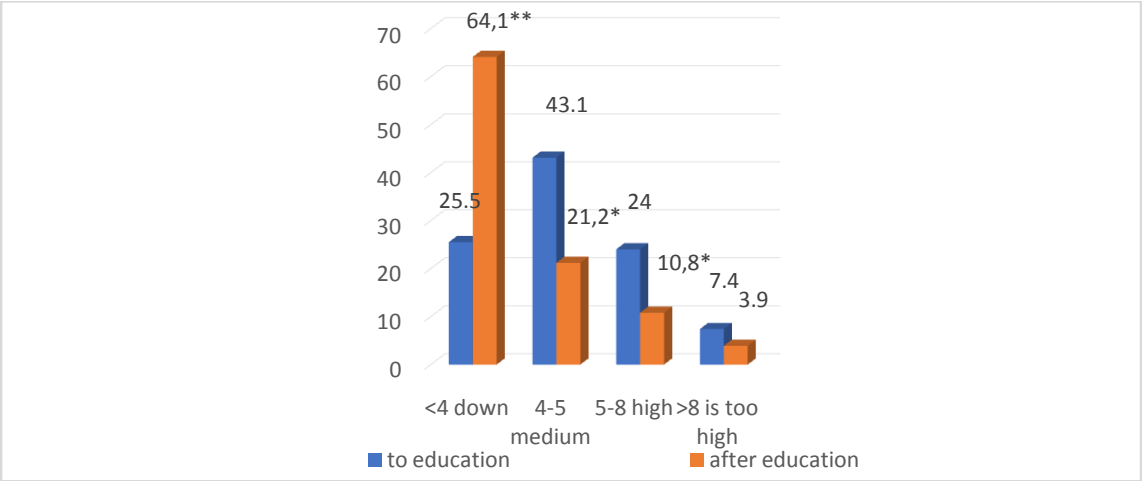

Figure 2.The impact of training in the “school of hypertension” on cardiovascular complications Note: * - (* - P<0,05; **-P<0,01).

Thus, the assessment of the total risk of death from CVD is currently a reliable tool for determining the probability of fatal events in the next decade and managing the risk. This methodology makes it easy and reliable to generate groups of moderate, high and very high total risk, to differentiate the treatment and preventive tactics of maintaining and monitoring these groups of people, which, of course, contributes to improving the effectiveness of control.

4. Conclusion

The use of an integrated approach - training patients with hypertension according to the educational program "school-hypertension" along with taking antihypertensive drugs, timely detection and monitoring of groups of people with a high and very high total cardiovascular risk of death using the SCORE scale helps to increase the effectiveness of therapeutic and prophylactic measures for hypertension and CVD.

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