

## Comparison of the Physicians' and Senior Medical Students' Knowledge in Some Issues of Treatment of Arterial Hypertension

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### Abstract

**Background:** Arterial hypertension is a pathology that affects the working-age population around the world. According to modern data, 35% to 40% of people suffer from hypertension. The danger of this disease lies in the rapid development of life-threatening complications (cerebrovascular, renal complications). Timely high-quality correction of hypertension makes it possible to prevent these conditions.

**Methods:** In this study, 361 questionnaires for doctors from 4 regions of Russia (Belgorod, Krasnodar Territory, Voronezh, Moscow) and 234 questionnaires for senior medical students in two Russian cities (Belgorod, Voronezh) were used and analyzed.

**Results:** Thirty four percent of physicians and forty five percent of students correctly defined the concept of resistant hypertension. The optimal class of drugs for initial therapy was chosen by 27.5% of doctors and 16.1% of students. The optimal class of drugs for the initial therapy of hypertension was chosen by 27.5% of doctors and 16.1% of students. Only 32.6% of doctors and 20.0% of students chose the correct treatment intervention, in which the effectiveness of lowering blood pressure increases. Only 36.4% of doctors and 20.0% of students correctly chose the indication for the appointment of aspirin in patients with hypertension.

**Conclusions:** The results of the study showed that there was not enough knowledge level among doctors and senior medical students in the treatment of arterial hypertension and the need for additional educational activities for current and future health professionals are critical.

**Keywords:** Arterial hypertension, Questioning, Knowledge level, Antihypertensive therapy.

### 1. Introduction

High blood pressure is a chronic disease in which the blood pressure rises in the arteries. Following this increase in pressure, the heart has to work harder than normal to maintain blood circulation in the vessels, and nearly 50% of people with high blood pressure are not

aware of their disease, and many patients are aware of their blood pressure by accident (1). A high percentage of patients with high blood pressure do not control their disease. High blood pressure is a major risk factor for stroke (2), myocardial infarction (3), heart failure (4), arterial aneurysms (5), peripheral artery disease

(6), and the cause of chronic kidney disease (7). Even a mild increase in arterial blood pressure is associated with reduced life expectancy (8). Changing diet and lifestyle can be effective in controlling blood pressure and reduce the risk of health complications. However, drug treatment is often necessary for people in whom lifestyle changes have been ineffective or insufficient. High blood pressure is one of the biggest health problems facing industrialized and developed countries. This disease is the most common chronic disease that is called the silent killer and is accidentally diagnosed by a doctor. Although it is preventable and usually treatable, if left untreated, it leads to fatal complications. Prevention, increasing the amount of knowledge and awareness, and changing the attitude and performance in controlling this disease can play a significant role.

Arterial hypertension (AH) is one of the most common pathologies in the world. According to modern epidemiological studies, the incidence of this disease is 30-45% (9). In Russia, over the past decade, the incidence rate among the population has increased from 40% to 44% (10). The prevalence of this pathology is higher in the male population (47%) than in the female (40%) (11, 12). The results of a research on the effect of nutrition on death from cardio-metabolic diseases showed that in 20 countries of the Middle East and North Africa, blood pressure is the most important cause of death in all these countries. Cardio-metabolic diseases have been responsible for 43% of premature deaths (under 70 years of age) and high blood pressure (over 115) is the most important risk factor and causes the death of 2,350 people per one million people (13, 14).

Treatment of moderate or severe hypertension reduces the rate of death and cardiovascular side effects in people 60 years and older, but in people over 80 years of age, treatment does not seem to significantly reduce the overall death

rate, but It can reduce the risk of heart disease (15).

The World Health Organization has identified high blood pressure as the main cause of death from cardiovascular disorders. WHL, an umbrella organization of 85 societies and the National Hypertension Forum, acknowledged that more than 50% of people with high blood pressure worldwide are unaware of their condition. To address this problem, the WHL launched a global awareness campaign about blood pressure in 2005, designating May 17 every year as WHD World Blood Pressure Day. Over the past three years, more national societies have participated in WHD and used more innovative activities to communicate the message to the public (16).

Due to the widespread prevalence of this disease, it is necessary to provide high-quality and timely medical care to patients, taking into account their individual characteristics. This is possible only with a high level of physicians' awareness of the treatment of hypertension (17, 18). The study aims to assess the basic level of physicians' knowledge and senior medical students in the treatment of arterial hypertension.

## 2. Materials and Methods

In the framework of multicenter research PHYSTARH (full name is "Physicians 'and undergraduates' knowledge in arterial hypertension treatment"), an anonymous survey among physicians from four regions of Russia (Belgorod and Voronezh regions, Krasnodar Territory, Moscow) and among students of two University (Belgorod State National Research University, N.N. Burdenko Voronezh State Medical University) was carried out.

The method of anonymous questioning was used in this study, for which an original questionnaire was developed based on current clinical guidelines (19). Approbation (validation) of the preliminary and final

versions of the questionnaire was carried out crosswise on a team of co-authors and pilot groups of students and doctors in the regions of the survey (20, 21). Physicians were asked to specify their specialty, category, and length of service and to determine whether they received the questionnaire for the first time or the second time. In this research, students with one year of study and one major were used to participate in the test. Respondents recorded their data to obtain more independent results, without the influence of a possible evaluation agent.

Some of the questions raised in this research regarding the treatment of high blood pressure were as follows:

1. Definition of "resistant hypertension"
2. The optimal class of drugs for primary antihypertensive therapy regardless of specific clinical conditions and limitations
3. Demonstration of a therapeutic intervention in which the effectiveness of reducing blood pressure is approximately 5 times greater than when the initial drug dose is used.
4. Determination of drug groups for metoprolol, perindopril, nifedipine, indapamide, verapamil, losartan, aliskiren, methyl dopa, and torasamide.
5. Choosing an indication for prescribing aspirin for patients with high blood pressure.

Participants were awarded 1 point for correct answers, 0.25 to 0.75 points for partially correct or incomplete answers, and 0 points for incorrect answers. For questions that required a "written" answer, no points were given if not answered. Therefore, for correct answers, the mean score was 1.0. The average value of correct, partially correct, and incorrect answers was determined as the average level of answer completeness (ARC) (22).

### 3. Data analysis

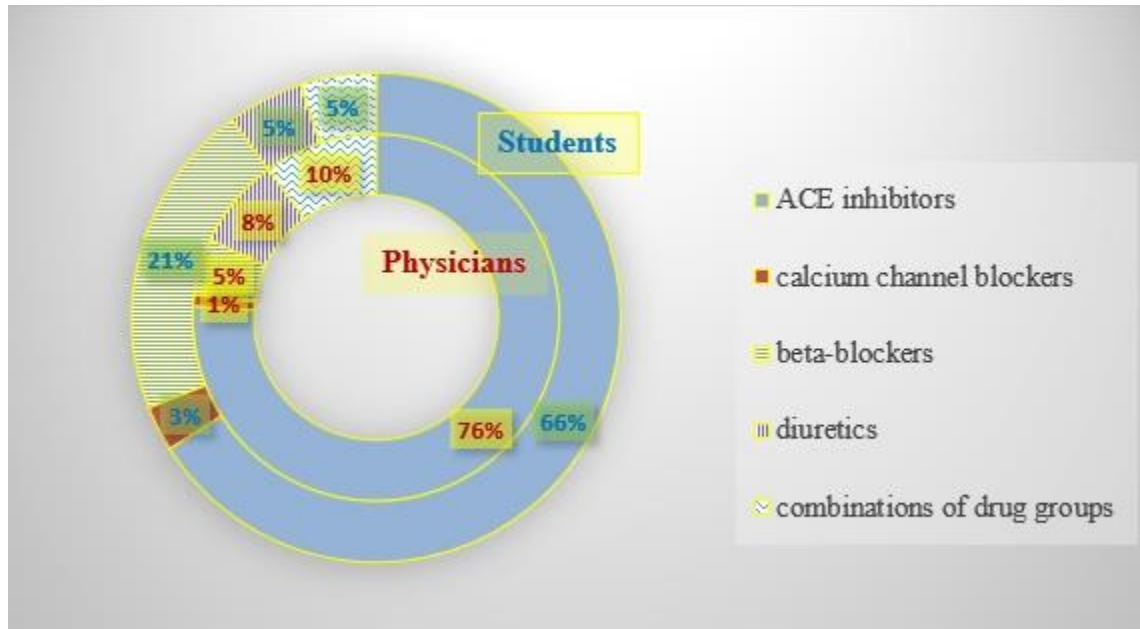
The indicators evaluated in this research included the average score of each respondent, the average score for individual questions, and the average score for centers (cities). After collecting the data, they were entered into the electronic database (23) and processed using Microsoft Excel and IBM SPSS Statistics 26 software. Statistical data were processed through the analysis of arbitrary contingency tables using Pearson's chi-square test ( $\chi^2$ ) and Cramer's V was used to assess the link strength between classification features (24, 25). It is necessary to emphasize that this method of knowledge evaluation is relative, being specially developed for this study, and cannot fully reflect the general level of respondents' knowledge.

### 4. Results

In this study, out of 361 questionnaires completed by physicians from 4 regions of Russia including Belgorod (40%), Krasnodar Territory (22%), Voronezh (13%), and Moscow (25%) were analyzed. Also, 234 questionnaires were used from medical students from two Russian cities (52% from Belgorod and 48% from Voronezh).

Only 34.0% of doctors and 45.0% of students correctly chose the definition of this concept, the differences in the answers were statistically significant ( $P=0.02$ , Cramer's  $V=0.145$ ). All five drug groups were correctly selected for initial antihypertensive therapy by 27.5% of physicians and a smaller number of students, 16.1% ( $P=0.03$ , Cramer's  $V=0.140$ ). The rest of the respondents chose only one or more options from the suggested groups of drugs (Figure 1).

**Figure 1. Distribution of incorrect answers to the question about the optimal class of drugs for initial antihypertensive therapy (%)**

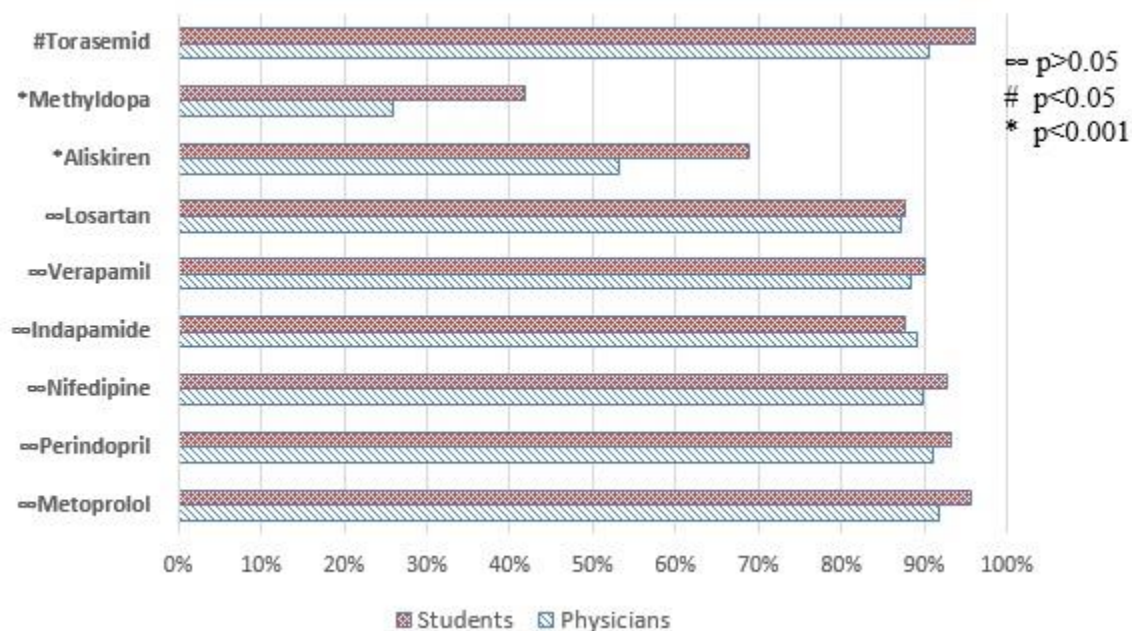


The combined treatment of AH was correctly chosen as a therapeutic intervention, in which it was proved that the effectiveness of lowering BP increased approximately 5 times more than when the dose of initial drug was doubled, by 32.6% of doctors and 20.0% of students, which had a statistically significant difference ( $P < 0.001$ , Cramer's  $V = 0.203$ ).

In the next question of the questionnaire, physicians and students had to indicate the groups to which the nine proposed drugs belong. The group of metoprolol was correctly identified by 91.7% and 95.7% ( $P = 0.065$ , Cramer's  $V = 0.079$ ), perindopril, 91.1% and

93.2% ( $P = 0.442$ , Cramer's  $V = 0.036$ ), nifedipine, 89.8% and 92.7% ( $P = 0.244$ , Cramer's  $V = 0.051$ ), indapamide, 89.2% and 87.6% ( $P = 0.598$ , Cramer's  $V = 0.024$ ), verapamil, 88.4% and 90.2% ( $P = 0.505$ , Cramer's  $V = 0.028$ ), losartan, 87.3% and 87.6% ( $P = 0.90$ , Cramer's  $V = 0.005$ ), aliskiren, 53.2% and 68.8% ( $P < 0.001$ , Cramer's  $V = 0.162$ ), methyldopa, 26.0% and 41.9% ( $P < 0.001$ , Cramer's  $V = 0.166$ ), torasemide, 90.6% and 96.2% ( $P = 0.014$ , Cramer's  $V = 0.105$ ), by physicians and students respectively (Fig. 3). Thus, the students named three groups of drugs statistically better.

**Figure 2. Distribution of correct answers to the question about the groups of antihypertensive drugs**



Only 36.4% of doctors correctly chose the indications for prescribing aspirin for patients with hypertension, which had statistically significant differences from the response rates of students ( $p=0.002$ , Cramer's  $V = 0.165$ ).

## 5. Discussion

The first question is devoted to the definition of "resistant hypertension". This condition is diagnosed if, with an adequate change in lifestyle in combination with the concurrent use of three antihypertensive agents of different classes (including a diuretic), it is not possible to achieve target blood pressure (BP) <140 and 90 mm Hg, respectively (26-28). The prevalence of true resistant hypertension does not exceed 10% among hypertensive patients (26, 29, 30).

There are five main groups of drugs that are used for drug therapy of AH: angiotensin-converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARB), calcium channel blockers (CCB), beta-blockers (BB), and diuretics. Any of the proposed groups of drugs is optimal for the initial therapy

of hypertension, without taking into account clinical situations and limitations (26). The results showed that compared to students, the studied doctors showed more interest in using medicines ACE inhibitors and combinations of drug groups. The knowledge level of the studied physicians and students was very close to each other, and these results clearly show the main role of the professor or mentor in transferring information.

Recent studies have shown the greatest effectiveness of the combined treatment of AH in comparison with the monotherapy. The advantage of such treatment lies in the possibility of physiological and pharmacological synergism of drugs, which affects both the severity of the decrease in BP and the elimination of possible side effects (26).

Violation of the rheological properties of blood significantly affected the speed of AH. Various experimental studies confirm the influence of hemorheological factors on the mechanisms of AH pathogenesis (31-33). However, the use of

antiplatelet drugs in low doses (especially aspirin) is justified only in special cases. Contraindicated in patients over 50 years of age with impaired renal function or very high risk of cardiovascular complications in the presence of previous myocardial infarction, ischemic stroke or transient ischemic attack (TIA), if there is a risk of bleeding (26, 34). An important condition for the use of aspirin is the presence of controlled arterial hypertension.

## 6. Conclusion

In the course of the analysis of the obtained results, it was concluded that the level of therapists' and senior students' knowledge in the treatment of hypertension is not high enough. ARC in most of the proposed questions is below 50% among both practicing doctors and future specialists. Due to the widespread prevalence arterial hypertension, it was revealed the need for additional educational activities for current and future healthcare professionals for a more in-depth study and further improvement of the tactics of managing different groups of patients with hypertension.

## Conflict of Interest

The authors declare that they have no conflict of interest.

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