

# Physicians' and Senior Medical Students' Knowledge of Drugs Contraindicated for Arterial Hypertension Treatment according to the Phystarh Study

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## ABSTRACT

**Introduction:** The relevance of work is dictated by the fact that arterial hypertension is often associated with other diseases and every physician and senior student should be aware of the contraindications to antihypertensive therapy (AT) in the most common nosologies – aV-block 2nd and 3rd degree, WPW-syndrome, gout, COPD and pregnancy.

**Aim:** To analyze physicians' and medical undergraduates' knowledge of main contraindications to AH treatment.

**Material and Methods:** During the multicenter study devoted to the assessment of physicians' knowledge in treatment of AH ("PHYSTARH" study), 296 people from 5 Russian and Ukrainian cities were surveyed in 2017-2018: 44,9% – 6th grade students, 55,1% – physicians.

**Results and Discussion.** The study revealed an insufficient level of students' and doctors' knowledge of main contraindications to AH

treatment. Less than half of the respondents correctly identified drugs contraindicated in pregnancy, gout, aV-block 2nd and 3rd degree, WPW-syndrome and COPD.

**Conclusion.** Despite the availability of antihypertensive treatment related clinical guidelines and sufficient number of information sources, the level of incorrect answers reaches a significant level in certain nosologies.

**Keywords:** arterial hypertension, antihypertensive therapy, level of knowledge, doctors, pharmacoepidemiology, students

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## INTRODUCTION

Arterial hypertension (AH) – is a disease that affects 37 million people every year [1, 2]. Cardiovascular, cerebrovascular and renal complications most often accompany this pathology [3, 4, 5]. It is also one of the leading causes of death in the world [6]. According to the recent epidemiological studies, about 54% of all stroke cases are associated with increased blood pressure [7, 8, 9]. The complexity of AH treatment is often associated with the presence of concomitant pathology or special conditions (pregnancy) that require individual selection of drugs and their dosage regimen [8, 9].

Therefore, the treatment of this pathology requires high-quality knowledge of senior medical students and physicians in the treatment of AH with important comorbid pathologies (aV-block 2nd and 3rd degree, WPW-syndrome, gout, COPD and pregnancy).

## AIM

To assess the level of physicians' and senior medical students' knowledge of main contraindications to AH treatment in aV-block 2nd and 3rd degree, WPW-syndrome, gout, COPD and pregnancy.

## MATERIAL AND METHODS

In the framework of the multicenter study "PHYSTARH" (the full name of the project "Physicians' and undergraduates' knowledge in arterial hypertension treatment"), an anonymous survey was conducted in 2017-2018 among 296 people from 5 cities of Russia and Ukraine (Belgorod, Voronezh, Dnipro, Krasnodar and Maikop) - 45% of senior students, 55% of physicians.

An original questionnaire was developed for this study [10-12]. This questionnaire is based on clinical guidelines of European Society of Cardiology 2013 [11]. Multiple-questions on absolute contraindications to antihypertensive drugs prescription in different groups of patients were analyzed in this survey.

Questions' analytics were the following:

- Patients groups: pregnant women, COPD patients, patients with aV-block 2nd and 3rd degree, WPW syndrome patients.

- List of AH-drugs: Enalapril, Verapamil, Bisoprolol, Hypothiazd and Torasemide.

- Possible answers: "right answer", "1 mistake", "2 or more mistakes", "wrong answer". The question on COPD suggested only two variants of the answer: "true / false".

All results were entered and analyzed using application programs Microsoft Excel, Access. Statistical data was processed by analyzing arbitrary contingency tables using the Pearson  $\chi^2$  criterion.

This method of knowledge evaluation was specially developed for the "PHYSTARH" project and cannot fully reflect the general level of respondents' knowledge.

Partial results of this work were reported at the 14th Congress of the European Association for Clinical Pharmacology and Therapeutics in Stockholm 2019 [13,14].

## RESULTS AND DISCUSSION

Calcium antagonists are absolutely contraindicated for prescription in WPW-syndrome. These drugs are able to improve the conductivity of the nerve impulse, including the additional bundle of Kent, which can cause ventricular fibrillation and atrial flutter [14, 15]. 39% of respondents

knew this (students – 30.8%, physicians - 45.4%,  $p < 0.05$ ), 23.5% answered with 1 or more mistakes (students-30.1%, physicians-17.8%,  $p < 0.05$ ), 37.5% answered wrongly (students-39.1%, physicians-36.2%,  $p > 0.05$ ) (Fig.1). The

following AH medications were mistakenly denoted as prohibited by the respondents: "Enalapril" – 7%, "Bisoprolol" – 29.4%, "Hypothiazid" – 10.6%, "Torasemide" – 5%.

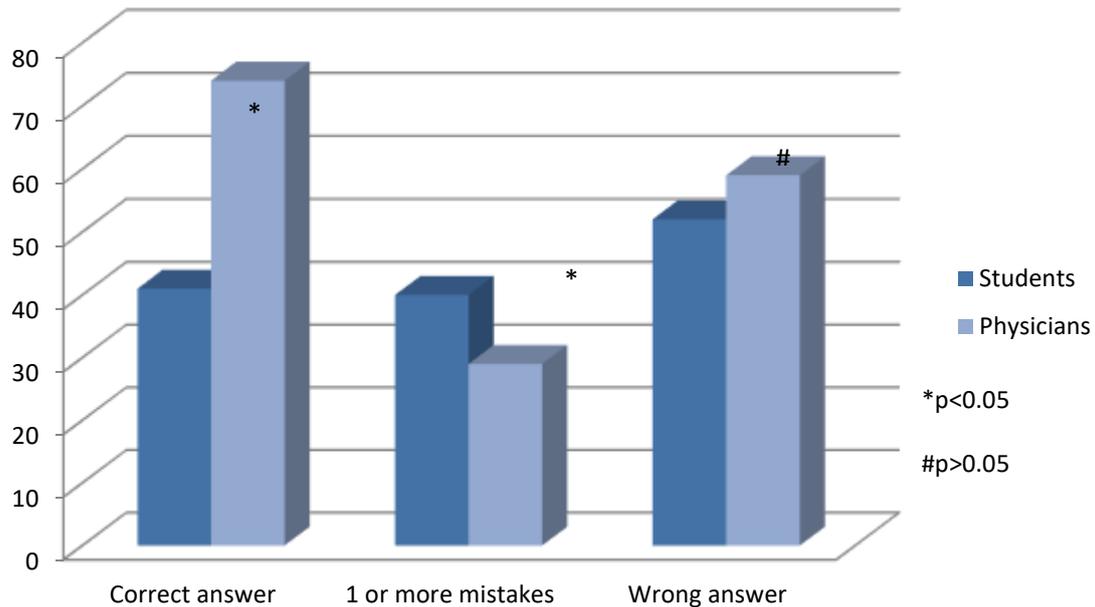


Figure 1: Distribution of answers to the question about drugs contraindicated in WPW-syndrome (%)

Pregnancy is a special condition in which some fairly effective antihypertensive drugs can cause serious harm to the fetus. But it is necessary to correct hypertension in these groups of patients [16], which means that the doctor must reliably know the allowed and prohibited list of drugs in pregnancy [11, 17 – 19].

Only 9% of respondents correctly identified drugs contraindicated in pregnancy, choosing Enalapril and Torasemide, 50% answered with 1 mistake, 23% with 2 or more mistakes, answered wrongly – 18%.

Gout is a disease associated with metabolic imbalance of uric acid. The leading cause of cardiovascular complications in patients with gout is arterial hypertension, the frequency of which reaches 47-72% [11, 20, 21]. The class of antihypertensive drugs contraindicated in gout is diuretics. 27.8% of respondents answered correctly, 39% with 1 mistake, 2.8% with 2 or more mistakes, 30.4% answered wrongly.

AV block is arrhythmia, which is accompanied by a slowdown in the conduction of a nerve impulse in the atrioventricular node [11, 22, 23]. Beta-blockers and dihydropyridine calcium channel blockers are contraindicated in aV-block 2nd and 3rd degree patients. 41.7% of respondents gave correct answers, 44% with 1 mistake, 0.3% with 2 or more mistakes, 14% answered wrongly.

There are no absolute contraindications to antihypertensive therapy in patients with COPD [11, 24, 25]. About 26% of respondents (students – 19.5%, physicians – 31.3%,  $p < 0.05$ ) know about it, 74% answered wrongly (students – 80.5%, physicians – 68.7%,  $p < 0.05$ ) (Fig.2). The following AH medications were mistakenly denoted as prohibited by the respondents: "Bisoprolol" – 58.1%, "Enalapril" – 18.7%, "Verapamil" – 5.4%, "Hypothiazid" – 3.3%, "Torasemid" – 3%.

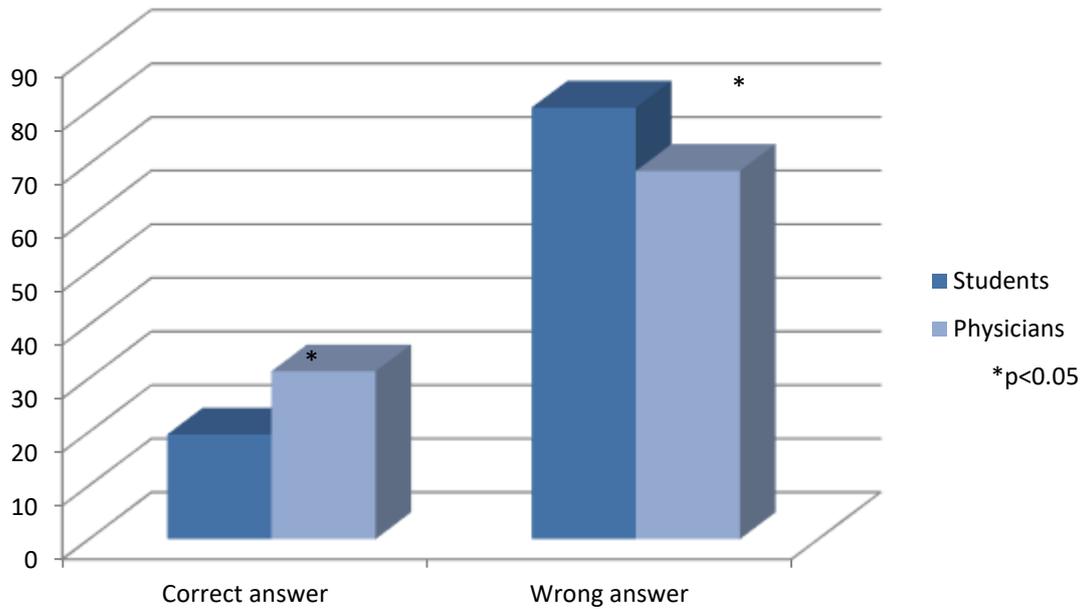


Figure 2: Distribution of answers to the question about drugs contraindicated in COPD (%)

The summary of all respondents' correct answers to the question about drugs contraindicated for AH treatment is presented below in Figure 3.

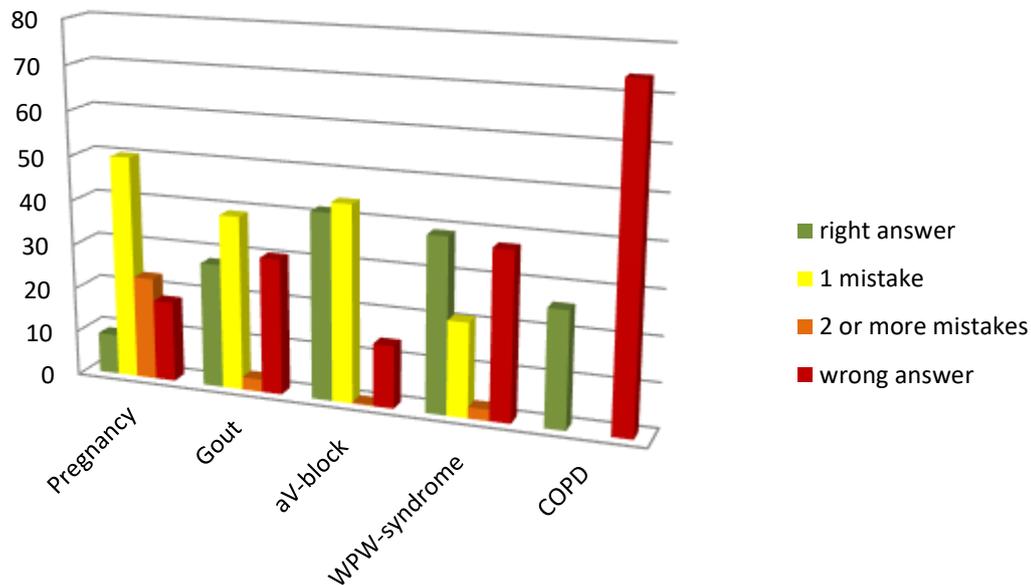


Figure 3: The levels of all respondents' correct answers to the question about drugs contraindicated for AH treatment (%)

## CONCLUSIONS

1. It was revealed that the problem of rational arterial hypertension treatment in pregnant women remains essential. Some specialists would prescribe potentially unsafe drugs (including ACE inhibitors).
2. It was revealed that 23.5% of the surveyed would restrict their patients from choosing the approved drugs in WPW syndrome treatment. It was also established that 37.5% of the respondents would not only limit the patient's drugs choice, but also to prescribe him the contraindicated medication.
3. A half of the respondents believe that beta-blockers (BB) is an absolute contraindication for COPD, however, BB do not increase but, on the contrary, lower exacerbations and mortality risks in chronic obstructive pulmonary disease.

4. Despite the availability of antihypertensive treatment related clinical guidelines and sufficient number of information sources, the level of incorrect answers reaches a significant level in certain nosologies. The physicians' and undergraduates' knowledge of absolute contraindications for drugs prescription in mentioned patients' states remains unsatisfactory and requires further continuous improvement.

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