CONCOMITANT CARDIOVASCULAR DISEASES AND ANTIHYPERTENSIVE TREATMENT IN OUTPATIENT PRACTICE (BY THE RECVASA REGISTRY DATA)

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Aim. To study a pattern of concomitant cardiovascular diseases (CVDs) and to estimate particularities and quality of medical antihypertensive therapy in hypertensive patients in real outpatient practice with a help of the Registry in Ryazan region.

Material and methods. A total of 3690 patients with hypertension, ischemic heart disease, chronic heart failure and atrial fibrillation, who had attended general practitioners and cardiologists of 3 outpatient clinics in Ryazan city, were enrolled in the outpatient Registry of cardiovascular diseases (RECVASA). The diagnosis of hypertension was recorded in 3648 of 3690 (98.9%) outpatient charts, 28.1% of the subjects were men and 71.9% - women.

Results. A total of 2907 (79.7%) of 3648 patients had combination of hypertension with other CVDs. Combination of 3-4 cardiovascular diagnoses was registered in 63.8% of the cases. 11.5% and 9.5% of the patients had a history of myocardial infarction and cerebral stroke, respectively. Diagnosis of hypertension was verified in 448 of 450 randomized hypertensive patients (99.6%). The incidence of prescription of one and two antihypertensive drugs (AHDs) was 25% and 39%, respectively, of 3 AHDs – 21%, 4 and more – 2%. AHDs were not prescribed in 13% of hypertensive patients. The mean number of prescribed AHDs was 1.73. The mean incidence rate of target blood pressure achievement was 26.1%.

We have noted insufficient ACE inhibitors/angiotensin receptor blockers (ARB) and beta-blockers prescription in different concomitant CVDs. Patients with 3-4 cardiovascular diagnoses were more often prescribed combined antihypertensive treatment. Prescription of ACE inhibitors/ARB, beta-blockers and thiazide diuretics combination was preferable in 74.1% of the cases, when taking into account absolute and relative contraindications for beta-blockers use – in 64.0%. 15.2% of the hypertensive patients used reimbursed drugs for CVDs at the moment of the Registry enrollment as compared with 39.2% in previous years (p<0.05).

Conclusion. The RECVASA study data allowed revealing high incidence of concomitant CVDs in hypertensive patients, insufficient use of combined antihypertensive treatment, including AHDs with proved favorable influence on prognosis. Achievement of concordance of medical treatment to national and international guidelines, taking into account concomitant CVDs, and optimization of patients’ coverage with reimbursed drugs are the main reserves for antihypertensive treatment quality improvement.

Keywords: registry, arterial hypertension, cardiovascular disease, combined antihypertensive treatment, treatment quality assessment, outpatient practice, concomitant cardiovascular pathology, concomitant indications for medical treatment, target blood pressure level.

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Сочетанные сердечно-сосудистые заболевания и антигипертензивное лечение у больных артериальной гипертонией в амбулаторно-поликлинической практике (по данным Регистра РЕКВАЗА)

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Цель. Изучить структуру сочетанных сердечно-сосудистых заболеваний (ССЗ), оценить особенности и качество медикаментозной антигипертензивной терапии (АГТ) у больных артериальной гипертонией (АГ) в реальной амбулаторно-поликлинической практике с помощью Регистра на территории Рязанской области.

Материал и методы. В амбулаторно-поликлинической Регистр кардиоваскулярных заболеваний (РЕКВАЗА) включены 3690 больных с АГ, ишемической болезнью сердца, хронической сердечной недостаточностью и фибрилляцией предсердий, обратившихся к терапевтам и кардиологам в 3-х поликлиниках г. Рязань. У 3648 из 3690 (98.9%) больных АГ были зарегистрированы АГ в анамнезе, у 3684 из 3690 (99.6%) пациентов была выявлена сердечная недостаточность, у 9.5% - инфаркт миокарда, у 11% - эпизоды сердечной астении, у 3% - эпизоды внутричерепных кровоизлияний, у 2% - патология периферической нервной системы. Результаты. У 2907 (79.7%) из 3648 больных имелось сочетание АГ с другими ССЗ. Сочетание 3-4-x из этих диагнозов зарегистрировано в 63.8% случаев. У 11.5% и 9.5% пациентов соответственно в анамнезе и при наступлении АГ имелась ишемическая болезнь сердца и мозга, у 21% и 17% - гипертоническая болезнь, у 3% и 5% - эпизоды внутричерепных кровоизлияний.

Заключение. Данные исследования РЕКВАЗА позволили выявить у больных АГ высокую частоту сочетанных ССЗ, недостаточную частоу назначения комбинированной АГТ, включающей АЛП с доказанными благоприятными действиями на прогноз. Важным резервом повышения качества лечения больных АГ являются достижение соответствия медикаментозной терапии национальным и международным рекомендациям с учетом наличия сочетанных ССЗ, оптимизация системы гипертонического лечения, оценка качества лечения, амбулаторно-поликлиническая практика, сочетающая сердечно-сосудистая патология, совместное оказание медицинской помощи, целевой уровень артериального давления.

Рациональная фармакотерапия в кардиологии 2016;12(1):4-15

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Cardiovascular diseases (CVDs) are the most common cause of death in adults in the majority of developed countries [1-4]. Arterial hypertension is the most prevalent CVD with the incidence rate of 25-40% in the population of most countries, which includes Russia, it is one of the major causes of disability and mortality [5-8]. Concomitant CVDs, which include ischemic heart disease (IHD), chronic heart failure (CHF), atrial fibrillation (AF), history of myocardial infarction (MI) and stroke, significantly worsen prognosis in hypertensive patients [5-8].

The development of registries is the most effective way to study the pattern of concomitant CVDs in hypertensive patients and to assess the quality of treatment of such patients in routine medical practice [9-11]. Some large registries of hypertensive patients include tens of thousands of patients and more [12-14]; a number of medical scientific centers in the Russian Federation (RF) also participated in the development of the Hypertension Registry [12]. However, only one of these registries integral analyzed the pattern of medical aid appealability and particularities of treatment of patients with different CVDs, including hypertension at the outpatient stage [14]. In the RF the estimation of the pattern of concomitant CVDs such as hypertension, IHD, CHF and AF, including the analysis of treatment particularities and outcomes in patients with combination of three and more CVDs, has been conducted within the RECVASA registry [15-17].

The majority of clinical studies and registries which evaluated the combination of hypertension with other CVDs had no possibility to analyze their structure integrally as well as particularities and quality of medical treatment of hypertensive patients with con-

Наиболее частой причиной смерти среди взрослого населения в большинстве развитых стран мира являются сердечно-сосудистые заболевания (ССЗ) [1-4]. Артериальная гипертония (АГ) – наиболее распространенное ССЗ, частота которого в популяции большинства стран, включая Россию, составляет 25-40%, это – одна из основных причин инвалидизации и смертности населения [5-8]. Существенное неблагоприятное влияние на прогноз у больных АГ оказывает наличие сочетанных ССЗ, включая ишемическую болезнь сердца (ИБС), хроническую сердечную недостаточность (ХСН), фибрилляцию предсердий (ФП), перенесенные в анамнезе инфаркт миокарда (ИМ) и мозговой инсульт (МИ) [5-8].

Организация регистров является наиболее эффективным способом изучения структуры сочетанных ССЗ у больных АГ, оценки качества лечения данной категории пациентов в реальной медицинской практике [9-11]. В нескольких крупных регистрах больных АГ проводилось включение десятков тысяч пациентов и более [12-14], ряд медицинских научных центров принимал участие в создании регистра АГ в т.ч. и в Российской Федерации [12]. Однако, лишь в одном из них комплексно анализировались структура обращаемости и особенности лечения больных с различными ССЗ, включая АГ, на амбулаторном этапе [14]. В РФ оценка структуры сочетанных ССЗ в рамках регистра больных АГ, ИБС, ХСН и ФП, в т.ч. с анализом особенностей лечения и исходов у больных с сочетанием трех и более диагнозов ССЗ проводится в рамках Регистра РЕКВАЗА [15-17].

В большинстве клинических исследований, регистров, оценивших сочетание АГ с другими ССЗ, не было возможности комплексно оценить их структуру, особенности и качество медикаментозного лечения больных АГ в сочетании с ИБС, ХСН и ФП, т.к. они не являлись одновременно и регистрами данных ССЗ.
comitant IHD, CHF and AF as they were not simulta-
neously the registries of these CVDs.

Clinical guidelines for hypertension diagnostics and
treatment present insufficient information about
principal variations of combination of three and more
CVDs in hypertensive patients, they also poorly clarify
special aspects of three-component antihypertensive
therapy prescription in such category of patients.

The above-mentioned demonstrates the relevance
and practical significance of concomitant CVDs
pattern and prescribed antihypertensive treatment
analysis in hypertensive patients within a framework
of an outpatient registry of CVDs in the RF region
(Ryazan Region).

Aim of the study – to study the pattern of con-
comitant cardiovascular diseases, assess special aspects
and quality of antihypertensive drug treatment in hy-
pertensive patients in routine outpatient practice
within Ryazan Region with the help of the Registry.

Material and methods
A total of 3690 patients with AF, Hypertension, IHD
and CHF, who had attended general practitioners and
cardiologists of 3 outpatient clinics in Ryazan city in
March-May 2012, September-November 2012 and
January-February 2013, were enrolled in the outpa-
tient registry of cardiovascular diseases – the RECVASA
registry. 3648 of 3690 patients (98.9%) had the di-
agnosis of “hypertension” in outpatient charts, among
them 1025 (28.1%) were men and 2623 (71.9%)
-women. All medical charts data of the patients in-
cluded in the Registry and data from charts of addi-
tional outpatient visits of 450 (12.3%) patients ran-
donized for the diagnosis of hypertension verification
were added to an electronic database for further analy-
sis. 24-hour BP monitoring and/or BP self-control were
conducted (when indicated) for the diagnosis verifi-
cation. The study design, inclusion and exclusion cri-
teria, general characteristics of the Registry were in de-
tail described earlier [15,16].

Statistical data analysis was conducted by me-
ths of descriptive statistics. Significance of mean val-
ues differences was estimated by the Student’s test.
Significance of differences in incidence rates of indices
presence in the groups of comparison was assessed by
a nonparametric method using the chi square test.
Statistical analysis of the data was conducted by the
SAS GLM software program.

Results
General characteristics of the patients with the
diagnosis of hypertension included in the Registry
Of 3648 patients with the diagnosis of hyper-
tension, enrolled in the RECVASA registry (mean age

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Of 3648 patients with the diagnosis of hyper-
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66.1±12.9 years), the majority (2516 persons, 69.0%) were of elderly age (60 years and above). 24.9% and 29.3% of the patients were in the oldest age groups: 65-74 years and above 74 years, respectively. Mean age of men and women was 63.2±13.2 and 67.5±12.5 years, respectively, so women were on average by 4.3 years older (p<0.001). The number of patients at the age regarded as the cardiovascular risk-factor was as follows: women 65 years old and above - 1518 (58.9% of their total number), men 55 years old and above - 773 (71.5%).

Concomitant cardiovascular diseases

A total of 2907 (79.7%) patients had combination of hypertension with IHD, and/or CHF, and/or AF according to the outpatient charts data. Figure 1 presents characteristics of different variations of CVDs combinations. The most frequent one was the combination of hypertension, IHD and CHF (49.6% of the cases), the least frequent – the combination of hypertension with AF and hypertension with AF and CHF (0.03% and 0.4%, respectively). It should be emphasized that the combination of 3-4 CVDs was revealed in the majority (63.8%) of the patients; such variations of concomitant CVDs are poorly represented in clinical guidelines due to the inadequate investigation. According to the outpatient charts data, hypertension was diagnosed in 98.8% of the IHD patients (2518 of 2548), in 98.7% of the CHF patients (2691 of 2726), in 98.3% of the AF patients (521 of 530); 418 (11.5%) of the hypertensive patients had a history of myocardial infarction (MI), 348 (9.5%) – a history of stroke, 72 (2.0%) patients had a history of both MI and stroke. On the average hypertensive patients had 2.6±0.3 cardiovascular diagnoses.

Verification of the diagnosis of hypertension

Verification of the diagnosis of hypertension was conducted in 450 (12.4%) randomized patients using data of examination, BP measurement at a visit to an outpatient clinic, outpatient chart’s information and prescribed (when indicated) BP 24-hour monitoring and BP self-control. The diagnosis was confirmed in 448 (99.6%) patients and was not confirmed in 2 (0.4%) cases. This leads to the conclusion that the study results with a high degree of confidence can be interpreted as obtained not only from patients with the diagnosis of hypertension in outpatient charts but also from patients with hypertension presence.

Concomitant cardiovascular diseases and antihypertensive treatment (RECVASA Registry)

Сочетанные сердечно-сосудистые заболевания и антигипертензивное лечение (Регистр РЕКВАЗА)
Antihypertensive medical treatment in hypertensive patients

*Prescription of the major antihypertensive drug groups*

The following antihypertensive drug (AHD) groups were prescribed the most frequently: ACE inhibitors – in 1835 patients (50.3%), beta-blockers (BB) – in 1523 (41.7%), thiazide diuretics (TD) – in 1360 (37.3%). Such drugs as angiotensin receptor blockers (ARB) and calcium antagonists (CA) were prescribed notably less often: ARB – in 973 (26.7%), CA – in 810 (22.2%), which included dihydropyridine CA – in 718 persons (19.7%) and non-dihydropyridine CA – in 92 (2.5%). Other AHDs were prescribed in 427 cases (11.7%) (Figure 2). Drugs of all these groups were significantly more often prescribed as a part of combined therapy rather than monotherapy (Table 1). As a monotherapy ACE inhibitors were used more frequently (22.9%) and TD – less frequently (1.7%). Beta-blockers, ARB and CA were significantly more often prescribed in patients with 1-2 CVDs, than in those with 3-4 (р<0.05). Beta-blockers were unequally indicated in 2336 (64.0%) patients (taking into account CHF presence, history of MI, and at the exclusion of cases of absolute and relative contraindications, such as bronchial asthma and chronic obstructive pulmonary disease). As a matter of fact, beta-blockers were only prescribed in 1207 cases (51.7%) in this category of patients. ACE inhibitors/ARB were indicated in 2744 patients with combination of hypertension and CHF and/or history of MI or stroke, the actual incidence of prescription was 76.8% (1385) of the cases.

*Prescription of two-component antihypertensive treatment*

Table 2 presents the incidence of main variations of two-component antihypertensive treatment pre-

### Table 2: Incidence of main variations of two-component antihypertensive treatment

<table>
<thead>
<tr>
<th>Two-component combination</th>
<th>Incidence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACEi – BB</td>
<td>50.3</td>
</tr>
<tr>
<td>BB – ARB</td>
<td>41.8</td>
</tr>
<tr>
<td>TD – ARB</td>
<td>34.1</td>
</tr>
<tr>
<td>ARB – CA</td>
<td>26.7</td>
</tr>
<tr>
<td>CA – BKK</td>
<td>22.0</td>
</tr>
<tr>
<td>Other</td>
<td>11.7</td>
</tr>
</tbody>
</table>

ACEi – ACE inhibitors, BB – beta-blockers, TD – thiazide diuretics, ARB – angiotensin receptor blockers, CA – calcium antagonists
<table>
<thead>
<tr>
<th>Main antihypertensive drug groups</th>
<th>Monotherapy</th>
<th>Combined therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HT, HT + 1 CVD</td>
<td>HT + 2 CVDs</td>
</tr>
<tr>
<td>ACE inhibitors / ИАПФ (n=1835)</td>
<td>12.7</td>
<td>10.2</td>
</tr>
<tr>
<td>Angiotensin receptor blockers / БРА (n=973)</td>
<td>7.7</td>
<td>3.5</td>
</tr>
<tr>
<td>Beta-blockers / БАБ (n=1523)</td>
<td>3.7</td>
<td>4.3</td>
</tr>
<tr>
<td>Thiazide diuretics / ТД (n=1360)</td>
<td>1.1</td>
<td>0.6</td>
</tr>
<tr>
<td>Calcium antagonists / БКК (n=810)</td>
<td>2.2</td>
<td>1.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incidence rate</th>
<th>37.3***</th>
<th>40.2***</th>
</tr>
</thead>
</table>

**p<0.0001 as compared with the incidence rate of a drug prescription as a monotherapy in an opposite group; †p<0.05 as compared with the incidence rate of a drug prescription as a combined antihypertensive treatment in 1-2 CVDs**

ИАПФ – ингибиторы АПФ; БАБ – бета-адреноблокаторы; ТД – тиазидные диуретики; БРА – блокаторы рецепторов ангиотензина; БКК – блокаторы кальциевых каналов

Table 2. Main combinations of two antihypertensive drugs: a share of patients included in the antihypertensive treatment scheme and incidence rate of target BP level achievement (%) in hypertensive patients (n=3648)

<table>
<thead>
<tr>
<th>Combination of two AHDs</th>
<th>Two-component antihypertensive treatment</th>
<th>Combination of 3 and more AHDs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Incidence rate of prescription</td>
<td>Incidence rate of target BP achievement</td>
</tr>
<tr>
<td>ACEi + TD / ИАПФ + ТД (n=772)</td>
<td>8.2</td>
<td>21.4</td>
</tr>
<tr>
<td>ARB + TD / БРА + ТД (n=478)</td>
<td>3.4</td>
<td>13.6</td>
</tr>
<tr>
<td>ACEi + CA / ИАПФ + БКК (n=605)</td>
<td>4.1</td>
<td>13.4</td>
</tr>
<tr>
<td>ARB + CA / БРА + БКК (n=72)</td>
<td>1.1</td>
<td>19.5</td>
</tr>
<tr>
<td>CA + TD / АК + ТД (n=330)</td>
<td>0.5</td>
<td>0.0</td>
</tr>
<tr>
<td>ACEi + BB / ИАПФ + БАБ (n=793)</td>
<td>8.4</td>
<td>28.6</td>
</tr>
<tr>
<td>ARB + BB / БРА + БАБ (n=453)</td>
<td>4.3</td>
<td>26.3</td>
</tr>
<tr>
<td>BB + CA(d) / БАБ + БКК(д) (n=282)</td>
<td>1.1</td>
<td>27.5</td>
</tr>
<tr>
<td>BB + TD / БАБ + ТД (n=607)</td>
<td>1.4</td>
<td>18.0</td>
</tr>
</tbody>
</table>

**p<0.0001 as compared with the incidence rate of two AHD combination prescription as the two-component antihypertensive treatment scheme; †p<0.05 as compared with the incidence rate of target BP achievement at the two-component antihypertensive treatment prescription**

ACEi – ACE inhibitors, BB – beta-blockers, TD – thiazide diuretics, ARB – angiotensin receptor blockers, CA (d) – dihydropyridine calcium antagonists

ИАПФ – ингибиторы АПФ; БАБ – бета-адреноблокаторы; ТД – тиазидные диуретики; БРА – блокаторы рецепторов ангиотензина; БКК(д) – дигидропиридиновые блокаторы кальциевых каналов

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ARB and beta-blockers combination the incidence of target BP achievement was higher at 3- and more-component treatment regimen. In cases of other combinations of two AHDs additional increase in the number of AHDs did not significantly raised the incidence of target BP achievement (possibly, due to more severe CVDs and higher treatment resistance of hypertension).

Data on incidence rate of 3 and more AHDs prescription is listed in Table 3. Combination of ACE inhibitors, ARB, beta-blockers prescription in hypertensive patients with CHF and history of MI and stroke (%)

Table 3. Incidence rate of main options of three-component antihypertensive therapy prescription and target BP achievement (%)

<table>
<thead>
<tr>
<th>Main combinations of three AHD</th>
<th>Three-component antihypertensive treatment</th>
<th>Incidence rate of prescription</th>
<th>Incidence rate of target BP achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACEi+BB+TD / ИАПФ+БАБ+ТД (n=321)</td>
<td>6.5 (n=237)</td>
<td>25.7</td>
<td></td>
</tr>
<tr>
<td>ARB+BB+TD / БРА+БАБ+ТД (n=220)</td>
<td>4.2 (n=155)</td>
<td>13.5</td>
<td></td>
</tr>
<tr>
<td>ACEi+CA+TD / ИАПФ+БКК+ТД (n=160)</td>
<td>2.5 (n=90)</td>
<td>8.9</td>
<td></td>
</tr>
<tr>
<td>ARB +CA+TD / БРА+ГК+ТД (n=140)</td>
<td>2.1 (n=77)</td>
<td>14.3</td>
<td></td>
</tr>
<tr>
<td>ACEi+BB+CA(d) / ИАПФ+БАБ+БКК(д) (n=140)</td>
<td>1.9 (n=71)</td>
<td>19.7</td>
<td></td>
</tr>
<tr>
<td>ARB +BB+CA(d) / БРА+БАБ+БКК(д) (n=90)</td>
<td>1.0 (n=37)</td>
<td>21.6</td>
<td></td>
</tr>
<tr>
<td>BB+TD+CA(d) / БАБ+ТД+БКК(д) (n=102)</td>
<td>0.4 (n=14)</td>
<td>14.3</td>
<td></td>
</tr>
</tbody>
</table>

ACEi – ACE inhibitors, BB – beta-blockers, TD – thiazide diuretics, ARB – angiotensin receptor blockers, CA (d) – dihydropyridine calcium antagonists

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Table 4. Incidence rate of ACE inhibitors, ARB, beta-blockers prescription in hypertensive patients with CHF and history of MI and stroke (%)

<table>
<thead>
<tr>
<th>Concomitant CVDs in hypertensive patients</th>
<th>ACEI</th>
<th>ARB</th>
<th>ACEi/ARB</th>
<th>BB</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHF / ХСН (n=2691)</td>
<td>50.3</td>
<td>26.8</td>
<td>77.1</td>
<td>44.6</td>
</tr>
<tr>
<td>History of MI / ИМ в анамнезе (n=418)</td>
<td>49.0</td>
<td>24.4</td>
<td>73.4</td>
<td>67.8</td>
</tr>
<tr>
<td>History of stroke / МИ в анамнезе (n=348)</td>
<td>55.5</td>
<td>21.3</td>
<td>76.8</td>
<td>39.9</td>
</tr>
<tr>
<td>CHF+MI / ХСН+МИ (n=407)</td>
<td>48.9</td>
<td>24.8</td>
<td>73.7</td>
<td>56.5</td>
</tr>
<tr>
<td>CHF + stroke / ХСН+МИ (n=304)</td>
<td>54.3</td>
<td>22.4</td>
<td>76.7</td>
<td>39.8</td>
</tr>
<tr>
<td>MI + stroke / ИМ+МИ (n=72)</td>
<td>50.0</td>
<td>19.4</td>
<td>69.4</td>
<td>47.2</td>
</tr>
<tr>
<td>CHF + MI + stroke / ХСН+ИМ+МИ (n=70)</td>
<td>51.4</td>
<td>18.6</td>
<td>70.0</td>
<td>47.1</td>
</tr>
</tbody>
</table>

ACEi – ACE inhibitors, ARB – angiotensin receptor blockers, BB – beta-blockers, CHF – chronic heart failure, MI – myocardial infarction

ИАПФ – ингибиторы АПФ; БАБ – бета-адреноблокаторы; ХСН – хроническая сердечная недостаточность; ИМ – инфаркт миокарда; МИ – мозговой инсульт

Назначение двухкомпонентной антигипертензивной терапии

Частота назначения основных вариантов двухкомпонентной АГТ представлена в табл. 2. Все девять возможных комбинаций двух АГГ основных групп чаще назначались в составе схемы АГГ с использованием трех и более пепкарственных средств (p<0,0001). Однако только для комбинации БРА и БАБ частота достижения целевого АД была более высокой при трех и более АГГ в схеме лечения. Для остальных комбинаций двух АГГ дополнительное увеличение числа АГГ не приводило к значимому возрастанию частоты достижения целевого АД (возможно из-за большей тяжести ССЗ, большей резистентности АГ к терапии).

В табл. 3 приведены данные о частоте назначения трех и более АГГ (за счет дополнения двухкомпонентной схемы назначением других АГГ). Комбинация ИАПФ, БАБ, ТД не только наиболее часто назначалась (в 6,5% случаев), но и наиболее часто приводила к достижению целевого АД (25,7%). Наиболее редко применялась комбинация БАБ,
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Table 4 demonstrates that in 2691 hypertensive patients with CHF not often enough were prescribed ACE inhibitors/ARB – in 77.1% cases and beta-blockers in 44.6%. Of 418 hypertensive patients with a history of MI ACE inhibitors/ARB and beta-blockers were only prescribed in 73.4% and 67.8% of the cases, respectively. So, the majority of patients were not prescribed these drug groups despite indications. Hypertensive patients with a history of stroke were not often enough prescribed ACE inhibitors (55.5%). It must be stressed that for the majority of patients enrolled in the Registry of patients with hypertension – 2702 (74.1%) both ACE inhibitors and beta-blockers were indicated, taking into account the presence CHF and history of MI. Hypertensive patients on the average received 1.7±0.9 AHDs (Figure 3), at that those with the combination of hypertension and CHF and hypertension with both IHD and CHF were prescribed significantly more antihypertensive drugs than those without concomitant CVDs (p<0.05%).

Treatment effectiveness, assessment of target BP and heart rate achievement in hypertensive patients

Target BP (<140/90 mm Hg) was achieved in 26.1% of cases (Figure 4). Patients with a combination of hypertension, IHD, CHF and AF revealed the highest incidence of target BP achievement (30.2%), while patients with a combination of hypertension with CHF and AF – the lowest one.

Heart rate (HR) was controlled within 60-89 per min in 84% of the subjects, at that, in combination of hypertension with CHF and AF – in 91.1% of the cases.

It is important to note that only 16.7% of hypertensive patients used reimbursed drugs regarding CVDs

**Figure 3. Mean number of antihypertensive drugs prescribed to patients enrolled in the Registry at the presence/absence of different combinations of hypertension with IHD, CHF and AF**

Рисунок 3. Среднее число назначенных антигипертензивных препаратов при наличии/отсутствии различных сочетаний АГ с ИБС, ХСН и ФП у включенных в Регистр пациентов
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at the moment of the Registry enrollment, which is significantly less than in previous years (33.1%), p<0.05 (Figure 5). Reasons for non-use of reimbursed drugs were unknown in the majority of cases – 2941 of 3019 (97.4%), only in 71 cases (2.4%) there was a patient’s refusal of the reimbursed drugs stated in an outpatient chart. The incidence of the reimbursed drugs use by hypertensive patients with a history of stroke and MI in outpatient settings decreased 2.5- and 2.4-fold: from 50% to 20% and from 54% to 23%, respectively, as compared with the previous period.

Figure 6 presents four major combinations of three AHDs in hypertensive patients with ≥3 cardiovascular diagnoses. Combination of ACE inhibitors/ARB, beta-blockers and TD was indicated more often in these patients (in 74.1% of the cases with and in 64.0% without regard to absolute and relative con-

Figure 4. Incidence rate of target BP achievement in patients on antihypertensive treatment with or without a combination of hypertension and IHD, CHF and AF
Рисунок 4. Частота достижения целевого уровня АД на фоне антигипертензивной терапии у больных АГ с наличием/отсутствием ее сочетания с ИБС, ХСН и ФП

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**Figure 6. Main rational and possible combinations of three antihypertensive drugs in hypertensive patients with three and more cardiovascular diagnoses**

Notes: 1. CHF presence demands ACEi/ARB and BB prescription, history of MI - BB, ACEi/ARB prescription, history of stroke – ACEi
2. According to RMSH/RSC (2010) and ESC (2013) guidelines hypertension is considered to be refractory at ineffectiveness of 3 antihypertensive drugs (including TD) in adequate doses

Рисунок 6. Основные рациональные и возможные комбинации трех АГП у больных АГ с числом диагнозов ССЗ≥3
Примечание: 1. При наличии ХСН необходимо назначение ИАПФ/БРА и БАБ, при ИМ в анамнезе необходимо назначение БАБ, ИАПФ/БРА, при МИ в анамнезе – ИАПФ
2. В соответствии с рекомендациями РМОАГ/ВНОК (2010), ESC (2013) АГ считается рефрактерной при неэффективности применения 3 АГП (включая ТД) в адекватных дозах

**Discussion**

The RECVASA study is one of the first outpatient prospective registries of cardiovascular diseases in Russia which was conducted in settings of outpatient clinical practice in Ryazan region. This article presents data of analysis of a part of the RECVASA study - the Registry of patients with hypertension. The fundamental rules of a registry organization were kept up, in particular, a formation of a continuous sampling of patients at their ongoing enrollment in the Registry for a selected period. In accordance with the aim of the study and the inclusion criteria, hypertensive patients enrolled in the Registry were representative to people appealing to outpatient clinics for CVDs, but not to summation of all hypertensive patients, residing in regions assigned to these outpatient clinics.

АГП (отмечены на рисунке цифрами 2, 3 и 4) показаны при недостаточной антигипертензивной эффективности двухкомпонентной АГТ.

**Обсуждение**

Исследование РЕКВАЗА, проводимое в условиях амбулаторно-поликлинической практики в Рязанской области – один из первых амбулаторных проспективных регистров кардиоваскулярных заболеваний в России, составляющей частью которого является Регистр больных с АГ, анализ данных которого приведен в настоящей статье. При его создании были соблюдены основные правила проведения регистра, в частности формирование сплошной выборки пациентов при непрерывном их включении в Регистр за определенный период. Соответственно цели исследования и критериям включения пациенты с АГ, включенные в Регистр, были репрезентативны именно по отношению к лицам, обращающимся в поликлиники по поводу ССЗ, а не к совокупности всех лиц с АГ, проживающих на территории, закрепленной за данными поликлиниками.

Результаты Регистра РЕКВАЗА в целом соответствуют данным, полученным в других регистрах АГ, о наличии у большинства больных АГ сочетанной сердечной патологии (ассоциированных клинических состояний) в 58-83% случаев [12-14], а также о наличии АГ у пациентов с ИБС, ХСН,
The RECVASA registry data is generally in line with other registries of hypertension, concerning the presence of concomitant cardiovascular comorbidity (associated clinical states) in a majority of hypertensive patients (58-83% of the cases) and also hypertension presence in 66-77% of patients with IHD, CHF and AF within the register of all these four CVDs [12-14].

Inclusion of patients with 4 different cardiovascular diagnoses is a key point of the RECVASA registry, which allows versatile estimation of concomitant cardiovascular pathology in hypertensive patients. It should be noted that present national and international guidelines for diagnostics and treatment of patients with hypertension and other cardiovascular diseases pay insufficient attention to combined cardiovascular pathology in patients with 3 and more cardiovascular diagnoses. The RECVASA research results highlight this insufficiently studied question. It was found out that one hypertensive patient had on the average 2.6 cardiovascular diagnoses. Besides, we have earlier demonstrated a significant increase in previous MI and stroke incidence rates at the increment of the number of cardiovascular diagnoses in patients enrolled in the Registry [14]. This is an additional proof of significance of recording of concomitant CVDs number in hypertensive patients.

Data concerning decreased use of reimbursed drugs by hypertensive patients received in the study, demands further analysis. It must be stressed that practical significance of frequency and effectiveness of reimbursed drugs use by patients with CVDs in routine outpatient practice in the RF is an understudied problem, including its assessment within the framework of registries.

Important expected results of the ongoing RECVASA study, which will be presented in further publications, are determination of ways how to improve examination and treatment of hypertensive patients with cardiac comorbidity, specification of factors, influencing the long-term prognosis, as well as the development of an algorithm for the evaluation of diagnostics and treatment quality in outpatient practice settings.

**Conclusion**

The RECVASA study has revealed concomitant CVDs in 2907 hypertensive patients (79.7%), including 2329 cases (63.8%) with 3-4 diagnoses of such diseases. It has also demonstrated low incidence of ACE inhibitors/ARB and beta-blockers prescription in hypertensive patients with CHF and/or history of MI, insufficient ACE inhibitors prescription in patients with previous stroke, low incidence rate of target BP achievement (26.1%).

Drugs indicated for treatment of both hypertension and concomitant CVDs (first of all, CHF, previous MI and stroke) are preferable for inclusion in combined antihypertensive treatment regimen, at that, combination and concomitant CVDs (first of all, CHF, previous MI and stroke) are preferable.

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nation of three and more CVDs, as a rule, requires three-component antihypertensive therapy prescription. Such drugs, first of all, include ACE inhibitors, ARB and beta-blockers which have proved favorable impact on prognosis at these variations of concomitant CVDs in hypertensive patients.

Improvement of conformity of antihypertensive medical treatment to national and international guidelines with regard to concomitant CVDs is an important reserve for the increase in target BP achievement incidence rate, decrease in risk of fatal and non-fatal cardiovascular events due to the effect (influence) on both hypertension and concomitant CVDs.

Optimization of patients’ supplying with quality reimbursed drugs is also a significant opportunity for the improvement of medical treatment quality.

Further publications of the results of the ongoing RECVASA study will present data of estimation of hypertensive patients’ status during the 3-year follow-up after the enrollment in the Registry, assessment of treatment adherence, analysis of sampling studies data with questionnaire survey and additional examination of a part of the patients.

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