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Physicians' adherence to the guidelines on the chronic heart failure diagnosis and treatment

Aim	To evaluate the physician's knowledge of basic provisions of clinical guidelines for diagnosis and treatment of chronic heart failure (CHF) and to determine how the actions of physicians in their everyday clinical practice comply with these provisions.
Materials and methods	The study analyzed anonymous questionnaires of 185 physicians (127 cardiologists, 40 internists and general practitioners, 18 other specialists) who were trained in advanced training programs during the 2020/2021 academic year. The main part of the questionnaire included 15 questions related to the classification, diagnosis, pharmacotherapy, and the use of implantable devices in the treatment of patients with CHF.
Results	The results showed that internists were less than cardiologists aware of major provisions of clinical guidelines for diagnosis and treatment of CHF. However, the knowledge of cardiologists could not be considered sufficient either. 57.5% of internists and 30% of cardiologists incorrectly indicated the main echocardiographic criterion for diagnosis of CHF with reduced left ventricular ejection fraction (CHFrEF). More than 40% of internists did not consider fluid retention with development of the congestion syndrome as a mandatory condition for administration of a loop diuretic to a patient with CHFrEF. 34.6% of cardiologists and 25% of internists correctly determined the indication for the administration of mineralocorticoid receptor antagonists. 37.6% of internists and 21.1% of cardiologists incorrectly indicated the dose of spironolactone recommended for achieving the neuromodulation effect. In determining doses of angiotensin-converting enzyme (ACE) inhibitors and beta-blockers, after arriving at which it is necessary to stop their up-titration, most of the physicians preferred to be based on systolic blood pressure (SBP) rather than on symptoms of hypotension. However, among therapists there were doctors for whom the patient's well-being and clinical symptoms, and not the level of SBP, were priority factors for choosing the tactics of the treatment with ACE inhibitors and beta-blockers. Physicians of both specialties were poorly familiar with indications for cardioverter defibrillator implantation; only 14.2% of cardiologists and 5% of internists chose the correct wording of indications.
Conclusion	The insufficient knowledge should be considered the basis for the low adherence of doctors to guidelines for diagnosis and treatment of CHF. When developing programs for advanced training of physicians in CHF, special attention should be paid to the use of renin-angiotensin-aldosterone system inhibitors and beta-blockers with detailed discussion of the dosing principles as well as of indications for implantation and results of using cardioverter defibrillators.

Keywords	Knowledge of physicians; chronic heart failure; clinical guidelines
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The list of treatments confirmed to improve the course and outcomes of chronic heart failure (CHF), mainly with reduced ejection fraction (HFrEF), is continuously growing. Nevertheless, CHF has an extremely unfavorable prognosis [1, 2]. There are many reasons for an incomplete response to the current treatment opportunities for patients with CHF in routine clinical practice, including inadequate organization of medical care, and material, technical, and financial constraints, as well as the presence of contraindications and poor tolerance of drugs, as well as low adherence to treatment in some patients. Nonconformity of CHF treatment to modern standards may also be associated with insufficient compliance by physicians to the clinical guidelines due to therapeutic inertia, rejection or unawareness of guidelines, lack of time, etc. [2, 3]. The commitment of physicians to the principles of evidence-based medicine has a significant impact on prognosis in patients with CHF [4, 5]. Although various algorithms and indices have been proposed for assessing the compliance of physicians with the clinical guidelines, there is no one-

size-fits-all approach to solve this problem [6]. In order to assess the level of training of physicians in the main areas of diagnosis and treatment of cardiovascular diseases, we conducted an anonymous questionnaire survey. Due to the anonymity of respondents, the information collected from them can be expected to reflect real-world practice. The survey results have been presented in several publications [7–10].

Objective

To study the awareness of physicians of the main provisions of the clinical guidelines for the diagnosis and treatment of CHF and determine to what extent the routine activities of physicians comply with these provisions.

Material and methods

An anonymous online questionnaire survey was carried out among trainees of continuing medical education courses in the Cardiology Scientific, Clinical and Educational Center of St. Petersburg State University in the academic year 2020–2021. The questionnaires were filled in prior to the beginning of the training. All subjects of the online survey signed consent to personal data processing. Unlike face-to-face surveys, online surveys cannot exclude the possibility of respondents referring to literature. Therefore, the questions were formulated in such a way that the responses reflect the responder's opinion based on his/her knowledge of clinical guidelines and personal experience. The respondent was asked to choose among the possible answers the one that most closely matched his/her opinion and/or routine activities. Responses were evaluated as correct if they were consistent with the provisions of the National Clinical Guidelines for the Diagnosis and Treatment of CHF [11, 12].

The survey included 197 physicians. The final analysis included 185 correctly completed questionnaires, of which 127 (68.7%) were submitted by cardiologists, 40 (21.6%) were presented by internists and general practitioners, and 18 (9.7%) questionnaires were submitted by other health professionals. The introductory part of the questionnaire included questions about the specialty, years of service, and demographic characteristics of the subjects. The mean age of respondents was 43.2 ± 8.3 years; the duration of service in the current specialty was 15.6 ± 7.6 years. The main part of the questionnaire included 15 questions regarding classification criteria, the formulation of diagnosis, drug therapy, as well the use of implanted devices in the treatment of patients with CHF. The drug therapy section included only questions concerning the use of drugs with the most clinically significant impact on the quality of life and prognosis in patients with HFrEF. The questions and response options are presented in Table 1.

The collected data were processed using Microsoft Excel 2010. The frequency analysis was used to establish the ratio of correct and incorrect responses in the group. The chi-squared test and Fisher's exact test were used to assess the significance of differences between the responses given by the respondents of the study groups (cardiologists and internists). The differences were considered statistically significant with $p<0.05$.

Results

The distribution of answers given by physicians to the questions of the main part of the questionnaire is summarized in Table 2.

In Question 1 and Question 2, respondents were asked to indicate the values of left ventricular ejection fraction (LVEF) at which they considered it possible to diagnose HFrEF and heart failure with preserved ejection fraction (HFpEF). Correct answers were received from 117 (63.2%) and 125 (62.5%) respondents, respectively. The diagnostic criterion of HFrEF (LVEF <40%) was correctly indicated by 70.0% of cardiologists and 42.5% of physicians ($p<0.01$); the diagnostic criterion of HFpEF (LVEF >50%) was

Table 1. Questions of the interactive questionnaire for trainees of continuing medical education courses

What is your age (number of full years)? **What is your specialty?** **What is your duration of service in current specialty (years)?**
1. Indicate a decrease (less than) in left ventricular ejection fraction (LVEF) when you consider appropriate to establish the diagnosis of chronic heart failure with reduced ejection fraction (HFrEF):
a. 55%; b. 50%; c. 45%; **d. 40%.**
2. The preserved LVEF is higher than:
a. 40%; b. 45%; **c. 50%;** d. 55%.
3. Which of the proposed wordings of the diagnosis of CHD is correct:
a. CHF functional class (FC) III; b. CHF stage IIA; c. CHF stage IIA, FC III; d. HFrEF stage IIA, FC III; **e. HFrEF (38 %) stage IIA, FC III;** f. I prefer the term "circulatory failure".

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4. What drug treatment for HFpEF (in the absence of contraindications and individual intolerance) do you consider mandatory to improve the prognosis:

a. Sacubitril/valsartan;

b. Angiotensin-converting enzyme (ACE) inhibitor;

c. Angiotensin II receptor blocker (ARB);

d. Beta-blocker (BB);

e. Mineralocorticoid receptor antagonist (MRA);

f. None of the above.

5. When would you prescribe a loop diuretic to a patient with LVEF <40 %?

a. In case of CHF FC II–IV with the signs of congestion;

b. With CHF FC III–IV, irrespective of the signs of congestion;

c. All patients with LVEF <40 % (irrespective of FC and the signs of congestion).

6. What do you think the indication for sacubitril/valsartan in CHF is:

a. Decompensated CHF during standard treatment with ACE inhibitor/ARB, BB, MRA, diuretics irrespective of FC and LVEF;

b. CHF FC II–IV irrespective of LVEF in ACE inhibitor/ARB intolerance;

c. Stable CHF FC II–III with LVEF <40 % with good ACE inhibitor/ARB tolerance but insufficient treatment efficacy, instead of ACE inhibitor/ARB;

d. Stable CHF FC II–III with LVEF <40 % with good ACE inhibitor/ARB tolerance but insufficient treatment efficacy, in addition to ACE inhibitor/ARB.

7. In what case do you consider it necessary to order MRA for a patient with CHF (in the absence of contraindications and individual intolerance)?

a. With LVEF<40 % irrespective of the severity of symptoms;

b. With LVEF<40% and symptoms of CHF FC III–IV;

c. In the presence of symptoms of CHF FC III–IV, irrespective of LVEF;

d. With LVEF<50 % irrespective of the severity of CHF symptoms.

8. What dose of spironolactone do you use to achieve neuromodulatory effect in patients with CHD?

a. 12.5–25 mg/day;

b. 25–50 mg/day;

c. 50–100 mg/day;

d. 100–200 mg/day;

e. maximum tolerated dose.

9. What dose of ACE inhibitor do you think is the best possible to treat of HFrEF?

a. The maximum dose that does not deteriorate well-being after a single dose;

b. The maximum titrated dose that not deteriorate well-being;

c. The maximum titrated dose that does not cause critical changes in the control physiological and biochemical parameters;

d. The minimum recommended dose, since the fact of using ACE inhibitor is more important than the dose of the drug.

10. At what systolic blood pressure will you stop up-titration of ACE inhibitor in the patient with CHF:

a. ≤110 mm Hg;

b. ≤100 mm Hg;

c. ≤90 mm Hg;

d. Any decrease in BP accompanied by the symptoms of hypotension;

e. Other: _____

11. What will you recommend if blood levels of creatinine increase by 50% from the baseline during up-titration of ACE inhibitor:

a. Continue up-titration of ACE inhibitor;;

b. Stop up-titration and continue administration of ACE inhibitor at the previous dose;

c. Reduce 2-fold the dose of ACE inhibitor;

d. Discontinue ACE inhibitor;

e. Other: _____

12. What dose of BB do you think is the best possible to treat of HFrEF?

a. The maximum dose that does not deteriorate well-being after a single dose;

b. The maximum titrated dose that not deteriorate well-being;

c. The maximum titrated dose that does not cause critical changes in the control physiological and biochemical parameters;

d. The minimum recommended dose, since the fact of using BB inhibitor is more important than the dose of the drug.

13. At what systolic blood pressure will you stop up-titration of BB in the patient with CHF:

a. ≤ 110 mm Hg;

b. ≤ 100 mm Hg;

c. ≤ 90 mm Hg;

d. Any decrease in BP accompanied by the symptoms of hypotension;

e. Other: _____

14. When will you recommend the implantation of a resynchronization device to the patient with CHF and LVEF<35 % during the best possible drug therapy:

a. Refractoriness to diuretics;

b. Duration of the QRS complex of 150 ms or more;

c. Duration of the QRS complex of 150 ms or more; life expectancy of at least 1 year;

d. Duration of the QRS complex of 150 ms and more with the presence of the left bundle branch block morphology and life expectancy of at least 1 year.

15. When will you recommend the implantation of a cardioverter-defibrillator to the patient with CHF:

a. All patients with CHF FC II–III and LVEF ≤ 35 %;

b. Patients with CHF FC II–III, LVEF ≤ 35 %, and episodes of unstable ventricular tachycardia;

c. Patients with CHF FC II–III, LVEF ≤ 35 %, episodes of unstable ventricular tachycardia, and contraindications to amiodarone;

d. Patients with CHF FC II–III, LVEF ≤ 35 % after myocardial infarction experience at least 40 days ago;

e. Patients with CHF FC II–III, LVEF ≤ 35 % after myocardial infarction experience at least 40 days ago, only if complete revascularization is impossible.

The correct answers are highlighted in color.

Table 2. Answers given by respondents to the questions of the main part of the questionnaire

Questions	Group	Answers, n (%)					
		a	b	c	d	e	f
1**	Total	9 (4.9)	29 (15.7)	30 (16.2)	**117 (63.2)**	—	—
	Cardio	4 (3.2)	17 (13.4)	17 (13.4)	**89 (70.0)**	—	—
	Int	5 (12.5)	8 (20.0)	10 (25.0)	**17 (42.5)**	—	—
2*	Total	6 (3.2)	8 (4.3)	**125 (62.5)**	46 (24.9)	—	—
	Cardio	6 (4.7)	4 (3.2)	**93 (72.4)**	25 (19.7)	—	—
	Int	0	2 (5.0)	**21 (52.5)**	17 (42.5)	—	—
3*	Total	3 (1.6)	3 (1.6)	23 (12.4)	18 (9.7)	**136 (73.6)**	2 (1.1)
	Cardio	1 (0.8)	0	17 (13.4)	13 (10.2)	**94 (74.0)**	2 (1.6)
	Int	2 (5.0)	2 (5.0)	4 (10.0)	4 (10.0)	**28 (70.0)**	0
4**	Total	10 (5.5)	124 (67.0)	7 (3.8)	18 (9.7)	6 (3.2)	**20 (10.8)**
	Cardio	8 (6.3)	91 (71.7)	2 (1.6)	6 (4.7)	4 (3.1)	**16 (12.6)**
	Int	1 (2.5)	23 (57.5)	4 (10.0)	9 (22.5)	2 (5.0)	**1 (2.5)**
5*	Total	**134 (72.4)**	18 (9.7)	33 (17.9)	—	—	—
	Cardio	**101 (79.5)**	9 (7.1)	17 (13.4)	—	—	—
	Int	**23 (57.5)**	6 (15)	11 (27.5)	—	—	—
6**	Total	18 (9.7)	6 (3.2)	**147 (79.5)**	14 (7.6)	—	—
	Cardio	9 (7.1)	3 (2.4)	**110 (86.6)**	5 (3.9)	—	—
	Int	6 (15.0)	3 (7.5)	**25 (62.5)**	6 (15.0)	—	—
7	Total	**57 (30.8)**	26 (14.1)	65 (35.1)	37 (20.0)	—	—
	Cardio	**44 (34.6)**	14 (11.0)	42 (33.1)	27 (21.3)	—	—
	Int	**10 (25.0)**	10 (25.0)	16 (40.0)	4 (10.0)	—	—
8*	Total	23 (12.4)	**123 (66.5)**	27 (14.6)	5 (2.7)	7 (3.8)	—
	Cardio	17 (13.4)	**92 (72.4)**	14 (11.0)	2 (1.6)	2 (1.6)	—
	Int	5 (12.5)	**20 (50.0)**	10 (25.0)	2 (5.0)	3 (7.5)	—
9*	Total	1 (0.6)	**65 (35.1)**	**104 (56.2)**	15 (8.1)	—	—
	Cardio	0	**53 (41.7)**	**65 (51.2)**	9 (7.1)	—	—
	Int	1 (2.5)	**8 (20.0)**	**26 (65.0)**	5 (12.5)	—	—
10*	Total	35 (18.9)	47 (25.4)	40 (21.6)	**61 (33.0)**	2 (1.1)	—
	Cardio	25 (19.7)	35 (27.5)	33 (26.0)	**32 (25.2)**	2 (1.6)	—
	Int	6 (15.0)	9 (22.5)	4 (10.0)	**21 (52.5)**	0	—
11	Total	7 (3.8)	53 (28.7)	**107 (57.8)**	18 (9.7)	—	—
	Cardio	4 (3.2)	41 (32.3)	**70 (55.1)**	12 (9.4)	—	—
	Int	2 (5.0)	11 (27.5)	**25 (62.5)**	2 (5.0)	—	—
12	Total	1 (0.5)	**73 (39.5)**	**97 (52.4)**	14 (7.6)	—	—
	Cardio	1 (0.8)	**57 (44.9)**	**64 (50.4)**	5 (3.9)	—	—
	Int	0	**11 (27.5)**	**24 (60.0)**	5 (12.5)	—	—
13**	Total	23 (12.4)	53 (28.7)	40 (21.6)	**64 (34.6)**	5 (2.7)	—
	Cardio	15 (11.8)	40 (31.4)	36 (28.4)	**32 (25.2)**	4 (3.2)	—
	Int	5 (12.5)	11 (27.5)	2 (5.0)	**21 (52.5)**	1 (2.5)	—
14*	Total	3 (1.6)	13 (7.0)	25 (13.5)	**144 (77.9)**	—	—
	Cardio	3 (2.4)	5 (3.9)	15 (11.8)	**104 (81.9)**	—	—
	Int	0 (0.0)	7 (17.5)	6 (15.0)	**27 (67.5)**	—	—
15	Total	12 (6.5)	46 (24.9)	78 (42.3)	**20 (10.8)**	29 (15.7)	—
	Cardio	8 (6.3)	32 (25.2)	53 (41.7)	**18 (14.2)**	16 (12.6)	—
	Int	2 (5.0)	11 (27.5)	16 (40.0)	**2 (5.0)**	9 (22.5)	—

* $p<0.05$; ** $p<0.01$. Int , internists. Cardio , cardiologists. Correct answers are shown in bold.

correctly specified by 72.4% of cardiologists and 52.5% of physicians ($p<0.05$).

In Question 3, respondents were asked to choose the correct wording for the diagnosis of CHF. The answer «e», fully consistent with the provisions of the clinical guidelines (included the characteristic and value of LVEF, stage and functional class (FC) of CHF), was chosen by 136 (73.6%) respondents, including 74.0% of cardiologists and 70.0% of internists ($p>0.05$). In Question 4, respondents were invited to indicate a drug that definitely improves the prognosis for

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patients with CHF. Only 20 (10.8%) respondents, including 12.6% of cardiologists and 1 internist, gave the correct answer «f» (none of the above»).

Question 5 assessed the awareness of the indications for use of loop diuretics. The correct answer «a» (CHF FC II–IV with signs of congestion) was given by 134 (72.4%) of the subjects, including 79.5% of cardiologists and 57.5% of internists ($p<0.05$).

In Question 6 on the indications for use of the sacubitril/valsartan complex, the correct answer «c» (stable CHF FC II–III with LVEF<40% and good tolerance but insufficient effectiveness of angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs), instead of these groups of drugs) was selected by 147 (79.5%) of the subjects. Cardiologists gave correct answers more often than physicians: 86.6% vs. 62.5%, respectively ($p<0.01$).

Question 7 on the indications for mineralocorticoid receptors antagonists (MRAs) was answered correctly (answer «a» – In LVEF less than 40% irrespective of the severity of CHF symptoms) by 57 (30.8%) respondents. Cardiologists chose the correct answer more often than internists; however, this difference was not statistically significant: 34.6% vs. 25%, respectively ($p > 0.05$). At the same time, Question 8 on dosing of spironolactone necessary to achieve a neuromodulatory effect in patients with CHF was answered correctly (answer «b» – 25–50 mg/day) by 123 (66.5%) respondents, and cardiologists indicated the correct dose of the drug more often than internists, 72.4% and 50%, respectively ($p<0.05$).

More than 90% of respondents indicated correct criteria for determining the optimal dose of the ACE inhibitor for patients with HFrEF (Question 9). Two of the proposed options were correct. Answer «b» (the maximum titrated dose that does not deteriorate well-being) was chosen by and answer «c» (the maximum titrated dose that does not cause critical changes in the control physiological and biochemical parameters) were chosen by 65 (35.1%) and 104 (56.2%) of subjects, respectively. The opinions of cardiologists and internists did not differ statistically significantly on this issue. However, only about 30% of physicians answered correctly Question 10 on the systolic blood pressure (SBP) at which an up-titration of ACE inhibitors should be stopped – answer «d» (any decrease in BP accompanied by the symptoms of hypotension), and internists chose this answer more often than cardiologists, 21 (52.5%) and 32 (25.2%) subjects, respectively ($p<0.05$).

Question 11 addressed the choice of a treatment strategy for increased blood levels of creatinine during ACE inhibitor up-titration. The option to reduce 2-fold the dose of the ACE inhibitor corresponding to the clinical guidelines (answer «c») was chosen by 107 (57.8%) respondents: 55.1% of cardiologists and 62.5% of internists ($p > 0.05$).

More than 90% of physicians correctly indicated the criteria for determining the best-possible dose of beta-blocker for the treatment of patients with HFrEF (Question 12). There were two correct options; here, 73 (39.5%) respondents chose the answer «b» (the maximum titrated that does not deteriorate well-being), while 97 (52.4%) subjects chose the answer «c» (the maximum titrated dose that does not cause critical changes in the control physiological and biochemical parameters). Cardiologists and internists did not differ in the frequency of correct answers. However, the correct answer «d» to the question concerning the level of SBP limiting the up-titration of the beta-blocker dose in patients with CHF (any decrease in blood pressure (BP) accompanied by the symptoms of hypotension) was given by only 34.6% of respondents, with internists being correct 2 times more often than cardiologists, 21 (52.5%) and 32 (25.2%), respectively ($p<0.01$).

Question 14 and Question 15 related to the definition of indications for the use of implanted electrophysiological devices in patients with CHF. Correct answer «d» concerning the indications for resynchronizing therapy (duration of the QRS complex of 150 ms and more with the presence of the left bundle branch block morphology and life expectancy of at least 1 year) was specified by 144 (77.9%) respondents. Here, cardiologists chose the correct answer more often than physicians – 81.9% and 67.5% of respondents, respectively ($p<0.05$). However, only 20 (10.8%) respondents specified correct clinical indications for the implantation of cardioverter-defibrillator (ICD) in CHF (answer «d»: patients with CHF FC II–III, LVEF ≤ 35% after myocardial infarction experience at least 40 days ago); there were no statistically significant differences in the correct response rate between cardiologists and internists ($p > 0.05$).

Respondents answered correctly on average 8.7 of 15 (57.8%) questions. More than 70% of correct answers were given by 14 (11.0%) cardiologists and 2 (5.0%) internists. Less than 50% of correct answers were given by 45 (35.4%) cardiologists and 23 (57.5%) internists.

Discussion

The answers to Question 1 and Question 2 of the main part of the questionnaire demonstrate a lack of knowledge of the CHF phenotypes among physicians, especially internists. LVEF as the main echocardiographic criterion was incorrectly indicated by 57.5% of internists and 30% of cardiologists for HFrEF and 47.5% of internists and 21.6% of cardiologists for HFpEF. At the same time, the majority of cardiologists and internists demonstrated the correct understanding of the principles of CHF diagnosis. Not quite correct (incomplete) diagnostic formulas were chosen by 27% of respondents.

Questions 4 to 13 related to the drug treatment of CHF. The answers to these questions provided an insight into physicians' knowledge of the main indications, dosing regimens, and safety control during the use with renin-angiotensin-aldosterone system (RAAS) blockers, beta-blockers, and diuretics.

Only 10.8% of respondents (10 cardiologists and 1 internist) answered correctly («none of the above») to the question on the drugs mandatory for the use to improve the prognosis in CHF. The majority of respondents (71.7% of cardiologists and 57.5% of internists) chose the «ACE inhibitor» option. There is no conclusive evidence on the effect of any pharmacological agent on the prognosis for patients with HFpEF. While on the one hand, RAAS blockers do not weigh down the outcomes of CHF, on the other hand, physicians' responses suggest that neither cardiologists nor internists discern large differences in the efficacy of ACE inhibitors in HFrEF and HFpEF.

The answers to Question 5 concerning the indications for loop diuretics in patients with LV systolic dysfunction were rather unexpected. More than 40% of internists did not consider fluid retention and congestive syndrome to be a prerequisite for initiating loop diuretics; this seems to be due to insufficient knowledge of the symptomatic and prognostic effects of diuretics in CHF among internists. At the same time, most cardiologists and more than 60% of internists correctly indicated use of the sacubitril/valsartan complex, a less traditional treatment of CHF. Such results can be a consequence of the large amount of regularly received information on the results of the clinical use of sacubitril/valsartan and the increased interest of physicians in a relatively new and highly effective drug. The respondents answered correctly to the question about the indications for MRAs significantly less frequently. Only 34.6% of cardiologists and 25% of internists chose the option «With LVEF<40% irrespective of the severity of symptoms», which complies with the clinical guidelines. More than 40% of cardiologists and 65% of internists consider the use of MRAs reasonable only in severe CHF FC III–IV. Apparently, the widespread perception by internists of MRAs as drugs having a mainly diuretic effect also explains the opinion of physicians on spironolactone dosing for neuromodulation. Internists answered correctly to this question significantly less frequent than cardiologists. Excessive doses of spironolactone, i.e., more than 50 mg/day, were chosen by 37.5% of internists and 14.6% of cardiologists.

Both internists and cardiologists mostly answered correctly to the question on the best possible dose of ACE inhibitors for the treatment of HFrEF: «the maximum titrated dose that does not deteriorate well-being» or «the maximum titrated dose that does not cause critical changes in the control physiological and biochemical parameters». But the answers to the question of when to stop the up-titration of ACE inhibitors in patients with CHF showed that the patient's well-being is not a driving factor for many physicians when selecting treatment strategy. For example, 73.5% of cardiologists and 47.5% of internists chose answers indicating specific levels of SBP, despite the recommendation that up-titration of ACE inhibitor dose should be stopped when symptoms of hypotension develop irrespective of BP levels. The question on the treatment safety control concerned measures that should be taken if the blood levels of creatinine increased by 50% from the baseline during the up-titration of ACE inhibitors. The option to reduce by 2-fold the dose of the ACE inhibitor and continue treatment, which corresponds to the current guidelines, was correctly chosen by 57.8% of respondents. However, 32.3% of cardiologists and 27.5% of physicians recommended that the ACE inhibitor be continued at the same dose.

Opposing perceptions of the safety criteria for drug treatment of CHF were also shown by the answers to questions related to the administration of beta-blockers. When asked what dose of beta-blocker should be considered the best possible the treatment of HFrEF, the majority of respondents answered in compliance with the guidelines: «the maximum titrated dose that does not deteriorate well-being» or «the maximum titrated dose that does not cause critical changes in the control physiological and biochemical parameters». However, 71.6% of cardiologists and 45% of physicians responded to the question on the degree of BP reduction, when the beta-blocker dose up-titration should be stopped in patients with CHF, focused on SBP rather than the hypotension symptoms.

Thus, when choosing the tactics of up-titration for ACE inhibitors and beta-blockers, internists, unlike cardiologists, showed great caution and tended to individualize personalize drug treatment taking into account the characteristics of a particular patient. Among internists, there were more who prioritized patient's well-being and clinical symptoms, rather than SBP, when choosing the best possible doses of ACE inhibitor and beta-blocker.

The peculiarities of drug therapy of CHF in routine practice have been studied in several trials. Greene et al. [13] found that the recommended doses of ACE inhibitor/ARB sacubitril/valsartan, beta-blocker, and MRA were prescribed in 17%, 28%, and 77% of in the outpatient population with HFrEF, respectively. The recommended doses of ACE inhibitor/ARB and beta-blocker were achieved in 22% and 12% of patients with HFrEF included in the international prospective registry QUALIFY, respectively [5]. In the Russian part of the QUALIFY register, the percentage of patients who received target doses and ≥ 50% of the target doses was 21.5% and 62.3% for ACE inhibitors, 20.3% and 39.8% for ARBs, and 15% and 50.8% for beta-blockers,

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Монография «Кардиоонкология: новый вызов нашего времени. Сердечно-сосудистые осложнения противоопухолевого лечения»

В монографии описаны многие аспекты кардиоонкологии – важной дисциплинарной проблемы до настоящего времени остающейся малоизученной. Кардиотоксичность у онкологических пациентов является актуальной проблемой. Количество таких больных во всем мире неуклонно растет, а их активная противоопухолевая терапия, в том числе новыми, весьма агрессивными препаратами сопряжена с увеличением риска различных сердечно-сосудистых осложнений.

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Фундаментальные и прикладные аспекты мочегонной терапии

В данном учебном пособии описаны теоретические и прикладные аспекты мочегонной терапии. Особое внимание уделено диуретикам в лечении хронической сердечной недостаточности, артериальной гипертонии.

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Монография «Этюды дифференциального диагноза»

В монографии описаны навыки построения диагностической концепции на основе пропедевтического подхода к осмыслению жалоб и результатов физикального осмотра. Издание, созданное на основе личного 40-летнего опыта работы автора в многопрофильном терапевтическом стационаре будет полезно молодым специалистам, ординаторам и врачам общей практики.

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*** – стоимость почтовых услуг по пересылке оплачивается отдельно и расчитывается в зависимости от тарифов почты России или других служб доставки для каждого региона РФ.**

respectively [14]. Possible reasons for the non-compliance of the real-world drug treatment of CHF with the clinical guidelines include the characteristics of patients, such as physiological limitations, baseline hemodynamics, and kidney function. However, Jarjour et al. [15] identified such obstacles for increasing the beta-blocker dose in only 26.1% of patients: 20.7% for ACE inhibitor/ARB and in 11.1% for MRAs. The BIOSTAT-CHF study had comparable results: the recommended dose of ACE inhibitor/ARB and the target dose of beta-blocker were prescribed to 22% and 12% of patients with HFrEF, respectively, while restrictions on the use of these drug classes due to organ dysfunction or clinically significant side effects were correctly identified in 26% and 22% of cases, respectively [16]. Our findings suggest that the use of drugs that are not compliant with the clinical guidelines, but have been shown to improve the prognosis for patients with HFrEF, may be due, among other things, to a lack of professional knowledge and the inability or unwillingness of physicians to titrate the doses of drugs in accordance with the guidelines.

Most cardiologists and physicians (81.9% and 67.5%, respectively) determined the correct indications for resynchronizing therapy in patients with HFrEF. At the same time, physicians of both specialties were not familiar with the indications for ICD: only 14.2% of cardiologists and 5% of internists chose the correct wording of the indications. One in four (24.9%) respondents (equal percentages of cardiologists and internists) believe that ICD is indicated for patients with HFrEF only in case of unstable ventricular tachycardia, while more than 40% of respondents (mainly cardiologists) believe that this treatment should be used in patients with unstable ventricular tachycardia if there are contraindications to amiodarone. The distribution of answers to the last question reflects a lack of awareness on the part of physicians about the place of ICD in the treatment of patients with HFrEF and limited experience in their use.

Conclusion

Our findings show that internists are generally less aware than cardiologists of the main provisions of the clinical guidelines for the diagnosis and treatment of chronic heart failure. However, the corresponding knowledge among cardiologists is not sufficient. Only 11% of cardiologists and 5% of internists gave more than 70% of correct answers to the questionnaire, which corresponds to passing the attestation test. Thus, the low compliance of physicians with the clinical guidelines for the diagnosis and treatment of chronic heart failure should be attributed to a lack of knowledge. Special attention should be paid to the use of renin-angiotensin-aldosterone system blockers and beta-blockers with detailed discussion of the dosing principles and indications for the results of the implantation of cardioverter defibrillators when developing the continuing medical education programs for physicians on chronic heart failure.

Limitations

While the truthfulness of the answers to the questionnaire was ensured by the anonymity of the respondents, this imposed certain limits upon the interpretation of the results. Another limitation of the comparative evaluation of knowledge of cardiologists and internists is related to the quantitative difference between the two groups.

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