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Modern Methods of Treatment in Patients with Acute Heart Failure

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Summary: Acute heart failure (AHF) is a life-threatening condition that worsens the prognosis and reduces the patient's quality of life. Low adherence to treatment and doctor's recommendations increases the risk of AHF.

Keywords: heart failure, rehospitalization, adherence to treatment, questionnaires.

Relevance

Socioeconomic and medical costs for the treatment and rehabilitation of patients with chronic heart failure (CHF) are steadily growing, which is a significant incentive for research to optimize the management of patients with this disease [1-3]. It is known that the main criterion for the effectiveness of CHF therapy is a reduction in the risk of death and the frequency of repeated hospitalizations due to its decompensation [4]. Patients hospitalized with acute decompensated heart failure (AHF) within 90 days after discharge are characterized by a high risk of adverse outcome and rehospitalization [5]. Rehospitalization, in turn, is an independent risk factor for overall mortality in patients with CHF, along with advanced age, male gender, low systolic blood pressure,

It is well known that insufficient adherence of patients with CHF to the prescribed treatment is one of the independent reasons for repeated hospitalizations of patients with AHF [6]. According to some studies presented in the review by V.N. Larina et al. [6], up to 60% of patients with CHF do not follow medical recommendations, which is associated with an unfavorable course of the disease, a decrease in exercise tolerance, a deterioration in the quality of life, and a high risk of hospitalizations and mortality.

There are direct and indirect methods for assessing patient adherence to prescribed therapy. Direct methods include direct observation and medical control of the patient's intake of a drug in its quantitative measurement, assessment of the concentration of drugs and their metabolites in various biological fluids of the patient (urine, blood, saliva), monitoring of drug intake with a microsensor. This allows the doctor to track adherence to the medication regimen, and, if necessary, create a reminder system for the patient that is triggered when a medication is missed. Indirect methods for assessing adherence include: questionnaires, surveys, interviews, evaluation of patient self-control diaries, counting the drug used in packages, accounting for written and sold prescriptions, assessment of the response of various functional and biochemical target markers for drugs and the clinical response of patients, the use of built-in electronic chips in drug packages (pop-it sense system). Direct methods have certain advantages, such as accuracy or objectivity, at the same time they are expensive and difficult to reproduce in routine practice [7].

Unfortunately, there is currently no “gold standard” for assessing compliance with a high level of specificity. The questionnaire for assessing adherence to drug therapy in patients with CHF is not

regulated. Among a dozen methods for diagnosing and monitoring how patients comply with medical recommendations for taking medications and changing lifestyles, there is not a single one that is devoid of shortcomings and provides answers to these questions with high accuracy.

Purpose of the study:to study the clinical and anamnestic data of patients with AHF and assess adherence to drug treatment based on the analysis of various questionnaires.

Material and methods

The study included 50 patients with a confirmed diagnosis of CHF, hospitalized due to AHF in the Department of Emergency Cardiology of the Bukhara branch of the Republican Center for Medical Emergencies and Voluntary Informed Consent to participate in the study. The average age of patients was 70.8±13 years, the proportion of male patients was 33% (n=16).

In the hospital, after stabilization of the condition against the background of the prescribed treatment, patients were asked to fill out a set of questionnaires, including the Morischi-Green questionnaires (MMAS-4 [8] and MMAS-8 [9]), ARMS [10], SEAMS [11], NODF-1 [12], COP-25 [13], to assess patients' adherence to therapy at the prehospital stage. For this study, questionnaires were selected that were developed and validated for patients with cardiovascular diseases. The characteristics of the questionnaires used are given in the table.

Таблица. Сравнительная характеристика опросников
Table. Comparative characteristics of questionnaires

Шкала, год создания Scale, year	**Количество вопросов** No. of questions	**Критерии лучшей приверженности** Score of maximum adherence	**Выборка, на которой валидизирован опросник** Patient cohort
MMAS-4 (4-item Morisky Medication Adherence Scale), 1986	4	4	**Пациенты с АГ, ИБС** / Hypertension, CHF
MMAS-8 (8-item Morisky Medication Adherence Scale), 2008	8	8	**Пациенты с АГ, ИБС, СД, психическими заболеваниями, подагрическим артритом, остеопорозом** Hypertension, CHF, diabetes, psychic disorders, gout, osteoporosis
ARMS (Adherence to Refills and Medications Scale), 2009	14	≤19	**Пациенты с ИБС, АГ** / Hypertension, CHF
SEAMS (Self-efficacy for Appropriate Medication Use Scale), 2007	12	27–39	**Пациенты с СД 2 типа, ИБС, остеопорозом, дислипидемией. Позволяет определить барьеры приверженности, особенно связанные с самим пациентом** T2D, CHF, osteoporosis, dyslipidemia Determines limits of adherence, particularly patient-related
НОДФ-1 (Национальное общество доказательной фармакотерапии), 2019 / National Society of Evidence-based Pharmacotherapy (NSEP-1), 2019	4	4	**Пациенты с неклапанной фибрилляцией предсердий** Nonvalvular atrial fibrillation
КОП-25 (Комплексная оценка приверженности), 2008 Complex Adherence Assessment (CAA-25), 2008	25	≥75%	**Пациенты с АГ. Позднее модифицирован до универсального** Hypertension Later, CAA-25 was modified to the universal one

Примечание. *АГ — артериальная гипертензия, ИБС — ишемическая болезнь сердца, СД — сахарный диабет.*
Note. *CHF, congestive heart failure; T2D, type 2 diabetes.*

The results were analyzed using the Statistica 6 program and special software products with MS Office applications. The values of the mean (M) and its error (m) were used to quantify the studied parameters. Checking for the normality of the distribution of the measured variables was carried out on the basis of the Kolmogorov-Smirnov test. The significance of differences in the studied parameters in the compared groups was established by Student's t-test ($t>2$, $p<0.05$). Statistical significance of differences was assessed by unpaired Student's t-test. To reject the null hypothesis (no difference), statistical significance levels $p<0.05$ were taken.

Research results

In this study, the most common causes of AHF in patients were tachysystolic atrial fibrillation associated with coronary heart disease (CHD) — 63%, decompensated valvular heart disease — 13%, and acute forms of CAD without concomitant heart rhythm disturbances — 7%, other causes accounted for 17% of all cases.

A history of 44 (89%) patients had arterial hypertension (AH), 13 (26%) patients had previously suffered myocardial infarction, 9 (18%) patients had cerebrovascular accident, 1 (2%) patient had pulmonary embolism. The most common comorbidities were: type 2 diabetes mellitus (DM) — 37% (n=18), gastric / duodenal ulcer — 5% (n=3), chronic obstructive pulmonary disease — 11% (n=5) , cancer was registered in 4% (n=2). More than a third (34%) of patients upon admission to the hospital had signs of iron deficiency anemia of varying severity. Active smokers at the time of admission were 8% of all patients with AHF included in the study.

According to the results of the analysis of the questionnaires, the adherence to drug therapy at the prehospital stage before the development of AHF, which served as the reason for the hospitalization of patients, was insufficient. Thus, only 43% of patients (n=21) received β-blockers and statins, 43% (n=21) - angiotensin-converting enzyme inhibitors (ACE inhibitors) / sartans, 47% (n=23) loop diuretics, antagonists of mineralocorticoid receptors - 21% (n=11). Only 3 patients took drugs from the SGLT2 inhibitor group: 1 as a therapy for type 2 diabetes, 2 as part of complex therapy for CHF. Of the 18 patients with a previously diagnosed type 2 DM, 10.15% (n=2) did not receive regular drug therapy, 56.55% (n=10) took oral hypoglycemic drugs, 22.2% (n=4) received insulin therapy .

An important aspect in assessing patient adherence to treatment is the proportion of people vaccinated against a new coronavirus infection. In the present study, only 3 patients (6% of the total sample) were vaccinated, and 13 (26%) had already had a new coronavirus infection. None of the participants in this study received influenza vaccination.

The proportion of patients demonstrating maximum adherence to the therapy varied from 4% to 58%: the MMAS-4 and NODF-1 questionnaires turned out to be the most “loyal” to low patient compliance, and the SEAMS questionnaires were the most “strict” (Fig. 1).

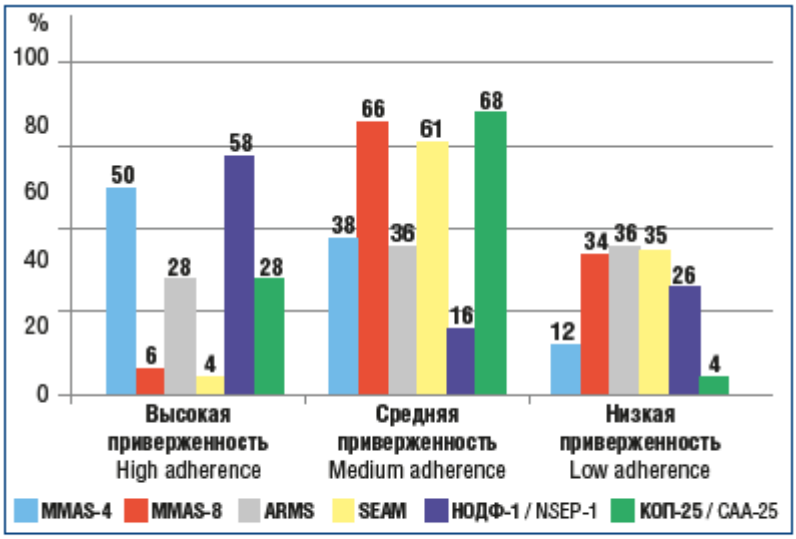

Рис. 1. Приверженность пациентов лечению по результатам различных опросников

Fig. 1. Adherence to treatment on the basis of various scales

We also analyzed the actual adherence in the most common nosological subgroup of patients with AHF: AF in combination with coronary artery disease (n=31, 62%). Patients with this diagnosis in most cases need to take anticoagulants, ACE inhibitors / sartans, β-blockers, statins. With regular intake of all 4 groups of drugs before admission to the hospital, the patient was considered adherent to treatment. Of the 31 patients, 7 patients were such, which corresponds to 22.6%. However, when interpreting the questionnaires of patients in this subgroup, different results were obtained (Fig. 2).

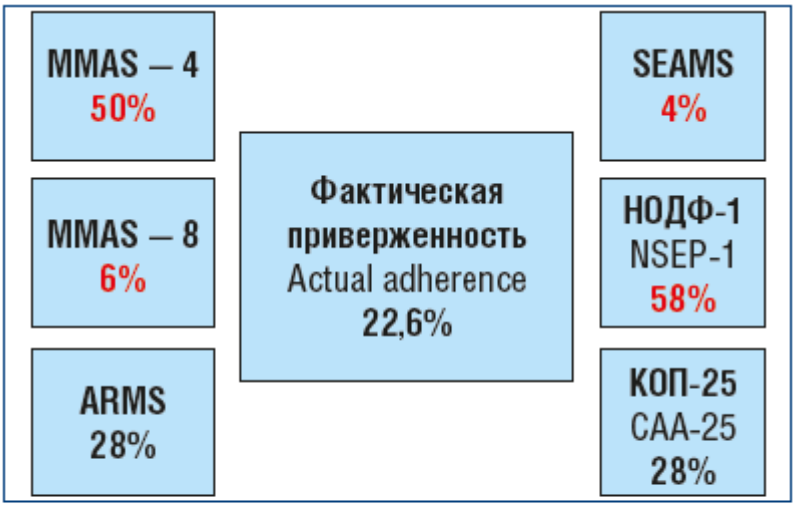

Рис. 2. Сравнение фактической и максимальной приверженности лечению по данным разных опросников

Fig. 2. Actual and maximum adherence to treatment on the basis of various scales

The result corresponding to the actual intake of drugs was obtained using the ARMS and COP-25 questionnaires. According to other questionnaires, the level of maximum compliance differed significantly from the level of actual compliance.

Conclusion

The results of the study confirm that patients with AHF have a low level of adherence to therapy at the prehospital stage. The lowest compliance rates were noted for prognosis-modifying therapy. Loop diuretics were regularly taken by 46% of patients, mineralocorticoid receptor antagonists - 22%, SGLT2 inhibitors - only 6%. The use of various questionnaires for assessing drug adherence led to heterogeneous results. The maximum level of compliance was noted when using the MMAS-4 questionnaire, the minimum level was observed when using the SEAMS questionnaire. An additional analysis revealed only 22.6% of compliant patients with CHF on the background of IHD and AF. Close to the actual result was obtained using the ARMS and KOP-25 questionnaires.

Thus, it is necessary to develop a unified questionnaire for assessing adherence to therapy in patients with AHF, which can most reliably reflect the compliance of this group of patients.

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