CURRENT THERAPEUTIC APPROACH IN HEART FAILURE – ADHERENCE TO GUIDELINES RECOMMENDATIONS

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Abstract: *Introduction. Adherence to guidelines treatment in patients with heart failure (HF) is of major prognostic importance, but thorough implementation of guidelines in routine care remains insufficient. Our aim was to investigate characteristics of HF in patients with ischemic heart disease (IHD), and to assess the adherence to current HF guidelines. Materials and methods. There were included patients admitted to the Cardiology Clinic with decompensate HF and IHD. Guideline Adherence Indicator was calculated as the number of drugs taken per number of drugs indicated; beta-blockers, angiotensin converting enzyme inhibitors/angiotensin receptor blockers and diuretics. Results: 98/111 patients entered the analysis. HF class II was prevalent in 51%, class III in 38,7% and class IV 9.18%,; 29/98 patients were diagnosed with HFREF (29%). A high prevalence of arterial hypertension and PCI was found. Global adherence indicator was 73%, HFPEF patients had a lower indicator. Conclusions. Pharmacotherapy was fairly well implemented in HFREF patients, worse in patients with more preserved ejection fraction.*

INTRODUCTION

Heart failure remains a major cause of morbidity and mortality worldwide and as the population ages, this burden continues to increase, mainly due to hospitalizations. Nearly 70% of all heart failure syndromes can be attributed to underlying myocardial ischemia.(1) Despite efforts to address the prevention of key risk factors for ischemic heart disease the incidence of hospitalizations continues to increase.

Patients with heart failure were classified according to the ejection fraction in heart failure with reduced ejection fraction (HFREF) and heart failure with reduced ejection fraction (HFPEF) ischemia playing a key role in all types. Patients with obstructive coronary artery disease are more likely to have HFREF, rather than IHFPEF, secondary to ischemic injury. The prevalence of HFPEF is increasing compared to HFREF.

Over the past 3 decades, several landmark clinical trials have provided solid evidence of the benefits of using pharmacological therapies in patients HFREF that have been endorsed by the American Heart Association (AHA) and European Society of Cardiology (ESC). In particular, this benefits are observed with long-term compliance with these drugs.(2,3)

The goals of drug treatment in heart failure (HF) patients are to improve their clinical status, functional capacity and mortality. Neurohormonal antagonists (angiotensin-converting-enzyme inhibitor ACEI, aldosterone receptor antagonists, and beta blockers) have been shown to improve survival in patients with HFREF and are recommended in the treatment of each patient provided they are not contraindicated or intolerant.(4)

Clinical recommendations for the diagnosis and treatment of acute and chronic heart failure translate the complexity of scientific research findings into recommendations for daily practice. Compliance with management guidelines has been shown to substantially reduce the severity of the disease and symptoms related to HF, as well as to improve the prognosis for re-hospitalization and mortality.(5)

The challenge of implementing the recommendations of the guidelines in current clinical practice is well known. The identification of barriers to implementing the guideline showed improvements in the usual management of the HF patient.

AIM

The aim of the present study was 1) to determine the characteristics of HF patients who were admitted to the county hospital of this region and 2) to assess the implementation of ESC guidelines on HF in this cohort of usually cared patients to identify potential targets for optimization of guideline adherence.

MATERIALS AND METHODS

The present study is an observational one, a retrospective that included patients admitted to the Cardiology Clinic of the Sibiu Clinical County Emergency Hospital between January 1st and December 31, 2017.

Patients were selected by consulting the electronic database of the Sibiu Clinical County Emergency Hospital. The selection process consisted of identifying patients diagnosed with heart failure who performed coronarography at the CVASIC Center. 111 patients were selected who were monitored for 2 years. Patient data were collected from the discharge sheet.

The algorithm presented in the table no. 1 was used to evaluate the adherence to the recommendations of the 2019 Heart Failure Guideline of ESC.

Guidance adherence index defined IAG = no prescribed drugs / no drugs according to the guide * 100.

Statistical processing was performed using SPSS software (SPSS INC. Chicago, Ilinois) v20. In the case of variables with normal distribution, the results were expressed as the mean ± standard deviation. The categorical variables were

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presented as percentages, and for their comparison the $\chi 2$ test was used. A α level of statistical significance of 0.05 ($p < 0.05$ considered significant) was considered.

Table no. 1. Algorithms for adherence to guidelines (6)

Therapeutic class	Conditions for therapeutic class use
ACEI	IF (NYHA class III OR IV at baseline) THEN guidelines apply; ELSE IF NYHA class II at baseline AND ("YES" to symptoms of breathlessness, ankle swelling or fatigue) THEN guidelines apply; ELSE IF diuretic prescribed THEN guidelines apply.
Beta blockers	IF 'NO' to diagnoses of asthma/COPD THEN guidelines apply
Diuretics	IF NYHA class II at baseline AND 'YES' to symptoms of ankle swelling THEN guidelines apply;

RESULTS

98 of the patients included in the study had valid information echocardiographic results, all the patients had data on medical history, HF symptoms could be classified into stages of HF according with New York Heart Failure Association (NYHA) Classification: NYHA II 50 (51,02%), NYHA III 38 (38,7%) and NYHA IV 9 (9.18%).

Mean age was 62.6±0.98 years. 29,9% patients were diagnosed with HFREF.

Table no 2. Characteristics, cardiovascular risk factor and comorbidities according to heart failure stages

NYHA CLASS	I and II	III	IV	p
Number (%)	50 (51)	38 (38,7)	9 (9.18)	
Sex (M)	48 (96)	31 (81.5)	8 (88.8)	0.236
hypertension	38 (60)	27 (71)	4 (44,4)	0.425
diabetes mellitus	24 (41,3)	16 (36,3)	3 (33,3)	0.825
cerebrovascular disease	6 (12)	3 (7.8)	0	0.527
Atrial fibrillation	2 (4)	10 (26.3)	1 (11.1)	0.026
EF <40% 40-50% >50%	 7 (14) 26 (52) 17 (34)	 15 (39.4) 14 (36.8) 10 (26.3)	 7 (77.7) 2 (22.2) 0	0.001
Number of affected vessels 1 2 3	 15 (30) 24 (48) 19 (38)	 9 (23,68) 11 (28.9) 24 (51.1)	 2 (22.2) 3 (33.3) 4 (44.5)	0.278
PCI	36 (72)	18 (47.3)	3 (33)	0.288
CABG	2 (4)	3 (7.9)	0	0.357
events	20 (40)	16 (42.1)	6 (66)	0.237

It has been observed that atrial fibrillation is associated with NYHA Functional Class III and IV in a high percentage, so rhythm disorders are associated with severe heart failure $p = 0.026$.

Hypertension was the most important risk factor; it was present in 62% of the patients.

In advanced HF stages, patients had significantly lower LVEF.

The number of affected coronary arteries was not significantly associated with HF severity class.

There was a high prevalence of interventional revascularization by PCI in the class II, 70% of the patients had an intracoronary stent.

Only 5% of the subjects had suffered a surgical revascularization.

Appearance of event (rehospitalization or death) in the following time was higher in class IV.

A total of 66% of patients were taking an ACE-inhibitor either an angiotensin type-II receptor blocker, 53% a beta-blocker, 79% a diuretic agent. Baseline medications are given in table no. 3.

Table no. 3. Pharmacotherapy of HF patients

Baseline medication	N=111	%
beta blockers	74	66.6
ACEI/ARN	74	66.6
diuretics	53	47.74
nitrates	55	49.54
anticoagulants	20	18.01
aspirin	79	71.17
Clopidogrel / ticagrelol	93	83.78

There is a significant difference between systolic dysfunction of the left ventricle and the level of treatment adherence to the guidelines, so patients with EF> 50% (HFEFP) have a lower adherence level and patients reduced EF, so patients with heart failure with left ventricular systolic dysfunction have better adherence to guideline indications ($p = 0.003$).

DISCUSSIONS

In this cohort of patients hospitalized for ischemic heart failure in our hospital, we found a high prevalence of HF stages II and III.

On the other hand, this study highlights the importance of arterial hypertension in patients with IHDA, which was the most important risk factor. Hypertension is an established independent risk factor for HF in all populations accounting for approximately 47% of ischemic events.(7)

The incidence of atrial fibrillation was 12.7% in the population of our study, mainly in the Nyha Class III and IV. The atrial fibrillation was correlated with the severity of the HF stage.

From these data it can be interpreted that atrial fibrillation may be a consequence of progression of heart failure or worsening of symptoms may be the consequence of atrial fibrillation, the interconnection between them being bidirectional and complex.

There were significant differences of symptoms severity in the three groups based on EF, so a negative correlation between EF and the NYHA class was found.

Angiographic features of coronary lesions can have a major influence on the severity of the symptoms in heart failure. The location of significant hemodynamic stenosis determines the myocardial territory affected by ischemia.

The number of vessels affected did not correlate with the severity of the symptomatology in our study, so patients with mild symptomatology had unicoronary and bicoronary lesions. However, patients with tricoronary lesions were in functional class III and IV, mostly.

The ASPIRE IV study also found that the number of coronary lesions had no major implications on the severity of the heart failure symptoms.(8)

The more severe the symptomatology, the more frequent the need for hospitalization/death during the period followed by us. Patients in class NYHA I and II had better survival than patients in class IV.

From our study it can be concluded that the severity of the symptoms at admission is a prognostic factor for the outcome of the patients. These results are reinforced by data from the literature supporting the NYHA Class as a strong prognostic factor in patients with heart failure.

We found comparable prescription rates for beta-blockers and ACEi/ARB but higher rates of diuretics. This might, at least in parts, be due to the fact, that all patients had a hospital stay within the previous 2 years and had been

discharged with optimized pharmacotherapy.

This study showed a high, but still not sufficient level of implementation current recommendations of HF guidelines in patients with ischemic heart failure. These results suggest that increasing patients' awareness of their diagnosis and importance of pharmacotherapy in chronic HF may be promising targets for the improvement of guideline implementation.

Limitations

One of the important limitations of the study regarding the evolution of patients under treatment was the lack of use of natriuretic peptides that could objectively evaluate the evolution of patients under treatment.

An important limitation of the adherence study is that treatment adherence was not followed for a longer period after discharge; this would have provided information on both the adherence of general physicians to the recommendations of the guidelines and the patients' compliance with the recommended treatment.

CONCLUSIONS

In our sample of CHD patients, we found a high prevalence of both asymptomatic HF Class II and Class III. A majority of patients had a preserved ejection fraction and revealed hypertension as major HF related factor.

Although pharmacotherapy of HFREF patients fairly well complied with current HF guidelines, its implementation was worse in patients with more preserved LVEF.

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