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Inventory of heart failure in Morocco: about a series of 120 patients

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SOUHRN

Cíl: Cílem této studie bylo zhodnotit kvalitu péče o nemocné se srdečním selháním ve srovnání se současnými doporučenými postupy na Klinice kardiologie Vojenské nemocnice Muhammada V. v Rabatu.
Materiály a metody: Do naší retrospektivní studie byli zařazováni po sobě následující jedinci přijatí pro echokardiograficky potvrzené srdeční selhání od ledna 2017 do března 2018 na Klinice kardiologie Vojenské nemocnice Muhammada V. v Rabatu. Pro analýzu údajů byl použit software SPSS 19.0.
Výsledky: Do studie bylo zařazeno 120 pacientů průměrného věku 66,42 ± 10,78 roku. Hlavním zjištěným rizikovým faktorem byla hypertenze následovaná kouřením a diabetem. Dyspnoe jako hlavní symptom byla uvedena v 97,5 % případů. Klinický obraz zahrnoval oboustranné srdeční selhání (83,3 %), levostranné srdeční selhání (80,8 %) a pravostranné srdeční selhání (38,3 %). Transtorakální echokardiografie prokázala srdeční selhání se sníženou ejekční frakcí u 68,3 % pacientů a srdeční selhání se zachovanou ejekční frakcí v 31,6 % případů.
Koronarografické vyšetření, provedené u 52 pacientů, prokázalo ischemickou chorobu srdeční v 65 % případů. Za hlavní etiologické faktory byly označeny ischemická choroba srdeční (57,5 %), chlopenní srdeční vada (24,1 %) a arteriální hypertenze (38,3 %).
Ve farmakoterapii jsou nejčastěji užívanými léky diuretika (97,5 %), inhibitory angiotenzin konvertujícího enzymu (ACE) / blokátory receptoru AT_1 pro angiotenzin II (86,6 %), beta-blokátory (33,6 %) a spironolacton (70 %), kombinace sacubitril/valsartan a ivabradin u 1,67 % pacientů. Mezi další používané léky patří digoxin (11,2 %) a amiodaron (9,2 %) u pacientů s fibrilací síní a refrakterním srdečním selháním. Na kardiovaskulární rehabilitaci bylo odesláno 16,6 % pacientů. Výkony jako elektrická kardioverze ani strukturovaná terapeutická edukace všech pacientů se neprováděly. Nemocniční mortalita dosáhla 1,6 %.
Závěr: Přes epidemiologické a klinické charakteristiky vykazuje námi popsaná skupina pacientů řadu podobných znaků, jaké lze nalézt v evropských nebo amerických registrech. Je třeba vynaložit maximální úsilí k optimalizaci medikamentózní léčby.

ABSTRACT

Objective: The aim of this study is to make an inventory of the quality of care regarding HF, in comparison with current recommendations, at the Cardiology Department of Mohammed V Military Hospital in Rabat.
Materials and methods: This is a retrospective study performed in consecutive patients admitted for heart failure documented by echocardiography, from January 2017 to March 2018, at the Cardiology Department of Mohammed V Military Hospital of Rabat. Data analysis is done by SPSS 19.0 software.
Results: One hundred and twenty patients with a mean age of 66.42±10.78 years were included. The main risk factor observed in our series was hypertension followed by smoking and diabetes. Dyspnea is the main symptom reported in 97.5% of cases. The clinical picture is that of biventricular HF (83.3%), left-sided HF (80.8%) and right-sided HF (38.3%). On transthoracic echocardiogram, HF with impaired ejection fraction is found in 68.3%. HF with preserved ejection fraction constitutes 31.6% of the cases.
52 patients underwent coronary angiography showing coronary artery disease in 65 % of cases.
The main etiologies found are ischemic heart disease (57.5%), heart valve disease (24.1%), and arterial hypertension (38.3%).
Therapeutically, the most used drugs are furosemides (97.5%). ACE inhibitors/ARBs (86.6%), beta-blockers (33.6%), and spironolactone (70%), sacubitril/valsartan and ivabradine (1.67%). Other used drugs are digoxin (11.2%) and amiodarone (9.2%) in patients with atrial fibrillation or refractory HF. 16.6% of patients were referred to the cardiac rehabilitation service. There was neither electrical treatment nor a structured therapeutic education for all patients. Intra-hospital mortality rate was 1.6%.
Conclusion: Despite the epidemiological and clinical features, our present series have many similarities with those of European and American registries. Efforts must be made to optimize medical treatment.

Keywords:
Coronary artery disease
Heart failure
Valve disease

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Introduction

Heart failure (HF) is a public health problem.[1,2] The number of patients with heart failure has been steadily increasing worldwide. The aging of the population and the improvement of the management of coronary artery disease, and hypertension remain the main etiologies.[3] In the West, the prevalence of heart failure is known. However, this is not the case in Africa,[4] particularly in North Africa.

Its management is the subject of international recommendations of which the homogeneous application differs for various reasons. The purpose of this study is to make an inventory of the quality of care regarding HF, in comparison with current recommendations, at the cardiology center of Mohammed V Military Hospital in Rabat.

Materials and methods

This is a retrospective study performed in the cardiology department of the MHMV in which we reused records of hospitalization of patients over the age of 15, admitted for an acute decompensated heart failure, from January 2017 to March 2018 .Clinical diagnosis of HF was validated in the emergency room or in the cardiology department by a cardiologist, supported by an electrocardiogram, a chest X-ray and a Doppler echocardiography. Socio-demographic characteristics, medical history, cardiovascular risk factors, clinical presentation, and therapeutic modalities are collected. Blood count, serum creatinine, electrolytes, blood glucose, total cholesterol, transaminases and C-reactive protein (CRP) are systematically requested. Troponin, thyroid stimulating hormone (TSH) and brain natriuretic peptide or its precursor (NTpro-BNP) are dosed on a case-by-case basis. HF with impaired systolic function is defined by a systolic fraction of the left ventricle <50%. Diastolic left ventricular dysfunction was retained when HF was accompanied by a preserved systolic EF (>50%), in the absence of an organic valvulopathy. The diagnosis of ischemic heart disease, in the absence of coronary angiography, is based on the association of a background pain, ECG anomaly, segmental and global kinetic disorders in transthoracic echocardiogram (TTE).

Among comorbidities, anemia is defined as hemoglobin (Hb) levels <12.0 g/dL in women and <13.0 g/dL in men (WHO). Renal failure is defined as a creatinine level >15 mg/l.

The collection and analysis of all these data are performed using SPSS 20.0 software. Relative frequencies and averages plus or minus standard deviation are calculated.

Table 1 – Characteristics of patients with heart failure in the different categories

Groups of HF (EF)			
Classification	**Systolic dysfunction with low EF**	**Systolic dysfunction with mid--range EF**	**Preserved ventricular function with normal EF**
Women (%)	10	5	20
Men (%)	39.17	11.67	14.17
Middle age (years)	64.59	69	67.8
Hypertension (%)	20.83	13.33	19.17
Diabetes (%)	23.33	6.67	15
Smoking (%)	9.17	3.33	0.83
Obesity (%)	10.83	4.17	10

Results

HF is responsible for 14% of hospitalizations. The average length of hospital stay is 10±4.6 days. The average age is 66.42±10.78 years. The most represented age group is 66–75 years, as in 44%. A clear male predominance (65%) versus female (35%) with a male-to-female ratio of 1.85. The main cardiovascular risk factors are hypertension (53.3%), followed by smoking (46.3%), and diabetes (40.8%), with a cumulative risk of 2 factors in 54.1%. A history of cardiovascular disease is found in 66.5%. Dyspnea is the main symptom reported in 97.5% of cases. Clinical presentation is that of biventricular HF (83.3%), left-sided HF (80.8%) and right-sided HF (38.3%).

On the chest x-ray the following signs were found: cardiomegaly (90%), interstitial syndrome (59.1%), and pulmonary focus (31.1%).

On the surface electrocardiogram (ECG), the main signs found are Q waves of necrosis (30.8%), secondary repolarization changes (44.1%), atrial fibrillation (AFib) (32.5%), conduction disorders dominated by left and right bundle branch blocks respectively in 34.3% and 18% of cases.

In half of the cases, biology shows electrolyte abnormalities, renal failure (14.1%), anemia (23.3%) and infectious stigmas (29.1%).

On transthoracic echocardiogram (TTE), HF with impaired ejection fraction is found in 68.3%. HF with preserved ejection fraction in 31.6% of cases (Tables 1, 2).

Table 2 – Distribution of patients according to etiology

Groups of HF (EF)			
Classification	**Systolic dysfunction with low EF**	**Systolic dysfunction with mid-range EF**	**Preserved ventricular function with normal EF**
Coronary heart disease (%)	5	3.33	15.83
Hypertension (%)	0.83	0	9.17
Valve disease (%)	5	3.33	15.83
Dilated cardiomyopathy (%)	35	1.67	1.67

Table 3 – Clinical and paraclinical characteristics of the 120 patients admitted for HF management at the cardiology center of Mohammed V Military Hospital in Rabat

Settings	Percentage (%), n = 120
Age (years)	66.4±10.28
Male	78 (65.5)
Cardiovascular risk factors	80 (66.6)
Hypertension	64 (53.2)
Smoking	56 (46.6)
Diabetes	49 (40.8)
Obesity/Overweight	42 (35)
Dyslipidemia	25 (20.8)
Heredity	10 (8.3)
Medical background	
Cardiovascular history	80 (66.6)
Renal failure	17 (14.1)
Systemic disease	8 (10.3)
Tumor	6 (5.00)
Pulmonary pathology	14 (11.6)
Clinical manifestations	
Systolic blood pressure	115.8±29.4
Diastolic blood pressure	73.7±16.1
Heart rate	98.7±25.8
Dyspnea (all stages)	117 (97.5)
Orthopnea	79 (65.8)
Paroxysmal nocturnal dyspnea	57 (47.5)
Chest pain	16 (13.3)
Left-sided heart failure	97 (80.8)
Biventricular heart failure	100 (83.3)
Right-sided heart failure	46 (38.3)
Electrocardiogram	
In sinus rhythm	52 (43.3)
Atrial fibrillation/flutter	39 (32.5)
Left ventricular hypertrophy (LVH)	15 (12.5)
Necrosis Q-wave	37 (30.8)
Secondary repolarization changes	53 (44.1)
Microvoltage	12 (10)
Bundle branch block	52 (43.3)
Atrioventricular block	7 (5)
Ventricular premature beats	13 (10.8)
Supraventricular premature beats	8 (6)
Transthoracic echocardiogram	
Enlarged LV end-diastolic volume	43 (35.8)
Reduced systolic ejection fraction	82 (68.3)
Preserved systolic ejection fraction	38 (31.6)
Pulmonary arterial hypertension	57 (47.5)
High filling pressures	74 (61.6)
Atrial enlargement	106 (88.3)
Biology	
Hemoglobin	11.9±2.2
C-reactive protein	47.9±65.6
Urea	0.24±0.7
Creatinine	14.9±9.35
Clearance	52.8±20.42
Potassium	3.84±0.80
Natremia	135.9±18.1
Ultra-sensitive thyroid stimulating hormone	3.11±8.8

52 patients underwent coronary angiography which objectified coronary artery disease in 65% of cases.

The main etiologies found are ischemic heart disease (57.5%), heart valve disease (24.1%) and arterial hypertension (38.3%) (Tables 3, 4).

Table 4 – Distribution based on etiology and triggering factor of heart failure in the 120 patients at the cardiology center of Mohammed V Military Hospital in Rabat

Settings	Percentage (%)
Etiologies	
Ischemic heart disease	69 (57.5)
Heart valve disease	29 (24.1)
Hypertension	46 (38.3)
Dilated cardiomyopathy	40 (33.3)
Restrictive cardiomyopathy	2 (1.6)
Primary pulmonary hypertension	1 (0.8)
HF triggering factors	
Therapeutic/diet break	108 (90)
Arrhythmias (AFib)	39 (32.5)
Infections	35 (29.1)
Anemia	28 (23.3)
Renal failure	17 (14.1)
Pneumopathy/COPD superinfection	5 (4.1)

On the therapeutic side, the most used drugs are furosemide (97.5%). ACE inhibitors/ARBs (86.6%), beta-blockers (33.6%), spironolactone (70%), sacubitril/valsartan and ivabradine (1.67%). Other used drugs are digoxin (11.2%) and amiodarone (9.2%) in patients with atrial fibrillation or refractory HF. 16.6% of patients were referred to the cardiac rehabilitation service. Coronary angiography was performed in 43.3% of patients. Coronary lesions were found in 77% of cases, 27.50% underwent angioplasty and 9.17% were revascularized by coronary artery bypass grafting.

There was neither electrical treatment nor a structured therapeutic education for all patients.

The intra-hospital evolution was good, intra-hospital mortality rate was 1% in the group of systolic dysfunction with low EF.

The mortality at 6 months of follow-up was similar in the 3 groups around 1.6%.

The re-hospitalization rate was 20% for acute heart failure episode, 13.5% in the group of systolic dysfunction with low EF.

An improvement in EF was noted in 2 patients put on sacubitril/valsartan.

Unfortunately we could not do a long-term follow-up, several patients were lost to follow-up.

Discussion

The evolution of HF is full of acute decompensations/remissions due to factors of decompensation or its self-aggravation.[8] Hospitalizations are frequent in patients with heart failure. This high frequency is related to increasing rates of hypertension, diabetes mellitus, and to an improvement in the follow-up after myocardial infarction, which led to an increase in the prevalence of patients with chronic heart failure.

In our series, 56.6% of patients are hospitalized for acute decompensated HF for the first time, 24.1% and 15.3% experience their 2nd and 3rd hospitalizations, respectively. Same observation in Olmstead County, 83% of patients with HF were hospitalized at least once in less than 4.7 years.[9] In addition to that, 66.9%, 53.6%, and 42.6% of patients were hospitalized at least 2, 3, and 4 times, respectively. Interestingly, only 16.5% of hospitalizations were due to HF. Most hospitalizations (61.9%) were related to non-cardiovascular conditions, suggesting that multimorbidity is a key risk factor for patients with HF, rather than HF itself.[10] Readmission is strongly related to age-independent variables, such as the transition quality of care and complex social factors.[11,12]

The average age of our study population joins the Western series, but remains older in comparison to the African series.[4,13] This difference could be explained by the medical coverage that most of our admitted patients benefit from. Coronary artery disease and hypertension are the main causes of HF. An accurate diagnosis of the underlying cardiac pathology is essential for proper treatment, and echocardiography offers a complete, non-invasive, and relatively inexpensive evaluation.[14] Many patients with HF also have a concomitant coronary heart disease with a prevalence ranging from 50% to 65%.[15] In our series, the main cardiovascular etiology is ischemic heart disease (57.5%), which is consistent with data from several studies.

The predominant clinical form is acute congestive HF with impaired systolic function (68.3%). HF with impaired systolic function is best coded therapeutically. According to a recent study, the proportion of HF cases with impaired systolic ejection fraction increased from 47.8% in 2000–2003 to 56.9% in 2004 to reach 56% in 2007 and 52.3% between 2008 and 2010.[16] This could be explained by an increase in the prevalence of hypertension, diabetes mellitus, hyperlipidemia, and multiple chronic diseases at the time of diagnosis of HF with impaired ejection fraction in patients. Contemporary therapy includes several proven drugs to reduce mortality and hospitalization rates in large randomized trials.[1,2] It is recommended to start with ACE inhibitors/ARBs and beta-blockers as soon as possible then reach the maximum recommended dose or maximum tolerated dose by titration within the first six months.[8]

In our patients with left ventricular systolic dysfunction, the prescription of ACE inhibitors/ ARBs was 80.83% at admission and 86.67% at discharge. The prescription rate for beta-blockers was 41.67% at admission and 82.50% at discharge. The initiation of these therapeutic classes was effective on admission or during hospitalization in our study. Prescription rates for these drugs are broadly comparable to those reported in evaluation studies.[17,18] The average prescription rate at discharge from hospital in England is 73% for ACE inhibitors alone,[19] 85% for ACE inhibitors/ARBs and 82% for beta-blockers excluding patients with contraindications to the different molecules.[19]

For patients hospitalized for decompensated HF, the first immediate goal has remained unchanged for the past 15 years: rapid resolution of symptoms and congestion. Diuretics are the first-line drugs in the treatment of patients with heart failure and volume overload. Diuretics reduce venous return, reduce ventricular filling pressures, result in fluid loss and decrease symptoms of pulmonary and systemic congestion. They are prescribed in combination with ACE inhibitors/ARBs and beta-blockers in the majority of our patients, 97.50% of cases. This is partly due to a non-compliance with appointments and a precarious stability of patients due to frequent therapeutic breaks; some patients returning to consultation only when they are again decompensated or symptomatic.

The prescription rate of spironolactone would significantly reduce mortality by 30% and the frequency of hospitalizations for HF worsening by 35%. ACC and AHA recommend spironolactone addition in Class I to selected patients, for stage II–IV HF with reduced ejection fraction, with careful monitoring of renal function and serum potassium.[20] In our patients, the prescription rate of spironolactone is 70.83% of cases. These results are far from those reported in some Western series.[19] However, they accord with the results reported in African series (72.4%).[17] Other medications have been prescribed on a case-by-case basis depending on the cause of HF, risk factors or associated complications.

The difficulties of management in our case were mainly related to side effects or contraindications of drugs. The quality of long-term treatment with the optimal medical treatment remains a challenge. Since maximum doses cannot be reached in many patients, the maximum tolerated medical treatment is recommended.

Whether or not patients have coronary artery disease, the occurrence of HF is a dramatic event with a mortality rate of 28.7% at 1 year.[21] Coronary angiography is frequently performed in patients with a history of cardiovascular disease admitted for HF.[22]

Coronary angiography was performed in 43.3% of cases, and coronary lesions were found in 77% of cases. 27.50% underwent revascularization with primary angioplasty and 9.17% underwent coronary artery bypass grafting.

Cardiac rehabilitation is the major component of HF management, improves morbimortality and quality of life, and reduces rehospitalizations rates in multidisciplinary programs.[23]

In our series, 16% of patients are referred to the cardiac rehabilitation service. This rate is comparatively low compared to the rates observed in many Western series. This difference could be explained by the fact that our cardiac rehabilitation service is novel and had just been operational at the time of the study. There was no electrical treatment or placement of an intra-aortic balloon pump.

Conclusion

The main characteristics of this study are an early age, a clear male predominance, ischemic heart disease at the forefront of etiologies and a low rate of preserved ejection fraction HF. Despite the epidemiological and clinical features, our present series has many similarities with those of European and American registries. Therapeutically, despite the codified recommendations, the prescription rate of major drugs of HF in our series is satisfactory.

Efforts must be made to optimize medical treatment. This involves setting up cardiovascular rehabilitation and structured therapeutic education for patients.

Conflict of interest

The authors declare that they have no competing interests.

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