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RESEARCH ARTICLE

EPIDEMILOGICAL, CLINICAL AND ECHOCARDIOGRAPHIC FEATURES OF HEART FAILURE IN MOROCCO

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Abstract

Heart failure (HF) is a major public issue taking an epidemic dimension globally. Its incidence is continuing to rise because of a growing and aging population. We held a cross-sectional retrospective studyin the cardiology department of Mohamed V military teaching hospital of Rabat in morocco fromSeptember 2019 toSeptember 2021, including 104 patients admitted with HF. The mean age was 68.5 ±10.3year. Hypertension and diabetes mellitus are the most common risk factors. HF with reduced ejection fraction represents about 49%. Forty-four percent had dilated cardiomyopathy. Ischemic heart disease is the first cause of HF.

Introduction:-

HF is the end stage of all diseases of the heart and is a major cause of morbidity and mortality. The task force of the ESC has published recent guidelines in 2021 on the diagnosis of HF and define it as a clinical syndrome consisting of cardinal symptoms (e.g. breathlessness, ankle swelling, and fatigue) that may be accompanied by signs (e.g. elevated jugular venous pressure, pulmonary crackles, and peripheral oedema). It is due to a structural and/or functional abnormality of the heart that results in elevated intracardiac pressures and/or inadequate cardiac output at rest and/or during exercise. Currently, the most common terminology for describing HF is based on left ventricular ejection fraction (LVEF). HF with normal LVEF (≥ 50%) is defined as HF with preserved ejection fraction (HFpEF), and HF with decreased LVEF (< 40%) as HF with reduced ejection fraction (HFrEF). HF patients with LVEF in the range of 40% to 49% are defined as HF with midly reduced ejection fraction (HFmrEF). Although HFmrEF is now categorized as a separate entity, the epidemiology, pathophysiology, treatment, and prognosis of HFmrEF remain unclear [1].

Heart failure is a major public health problem, affecting more than 38 million people worldwide. The prevalence of heart failure continues to increase owing to improved long-term survival of patients with other forms of heart disease and its strong association with advancing age [2]. It has wide-reaching implications not only in terms of mortality and morbidity for affected individuals but also for the infrastructure required to provide care for these patients.

Coronary artery disease is the predominant cause of heart failure with reduced ejection fraction, which most commonly results in left ventricular dilation; hypertension is the predominant cause of heart failure with preserved ejection fraction, which is usually associated with left ventricular hypertrophy [3].

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This paper aims to study the epidemiological, clinical and echocardiographic features of heart failure through a retrospective study carried out in the cardiology department of Mohamed V military teaching hospital of Rabat in morocco.

Patients and Methods:

This is a descriptive cross-sectional study carried out in the cardiology department of Mohamed V military teaching hospital of Rabat. The study enrolled 104 patients who were admitted with decompensated congestive heart failure during the period fromSeptember 2019 toSeptember 2021.

All included patients were subjected to complete and detailed medical history, thorough physical examination, laboratory investigations, resting standard 12 leads electrocardiogram, chest X-ray, trans-thoracic echocardiography, and eventually coronary angiography.

Statistical analysis of results was performed using JAMOVI 1.6.23software.

Results:-

1.baseline characteristics :

The study included 68 males and 36 females, aged between 55 and 86 years (mean= 68.5 ±10.3year). fifty-three percent were hypertensives, 50% had a history of DM, 32.7% were smokers, 23% were obese (BMI > 30), 25% had dyslipidemia, 34% had a history of Ischemic heart disease. (table1)

Table 1:- Baseline characteristics of the study population:

Characteristics	Values (N = 104)
Age (years)#	68.5 ± 10,3
Sexe§	
male	68 (65.4)
Female	36 (34.6)
DM§	52 (50)
HTN§	56 (53.8)
Dyslipidemia§	26 (25)
Obesity§	24 (23.1)
Smoking (current)§	34 (32.7)

expressed inmean ± SD, § expressed innumber (percentage), HTN: arterial hypertension, DM:diabetes mellitus.

2.clinical and electrical features :

Sixty-two percent of the patient presented with HF stage III-IV and 38% were NYHA I-II. The average heart rate was 94.5 ± 28bpm. The mean of the systolic blood pressure was 119 ± 21.5 mmHg for the systolic and 68.9 ± 2.5mmHg for the diastolic. All patients had 12 leads ECG, the findings are shown in figure (1).

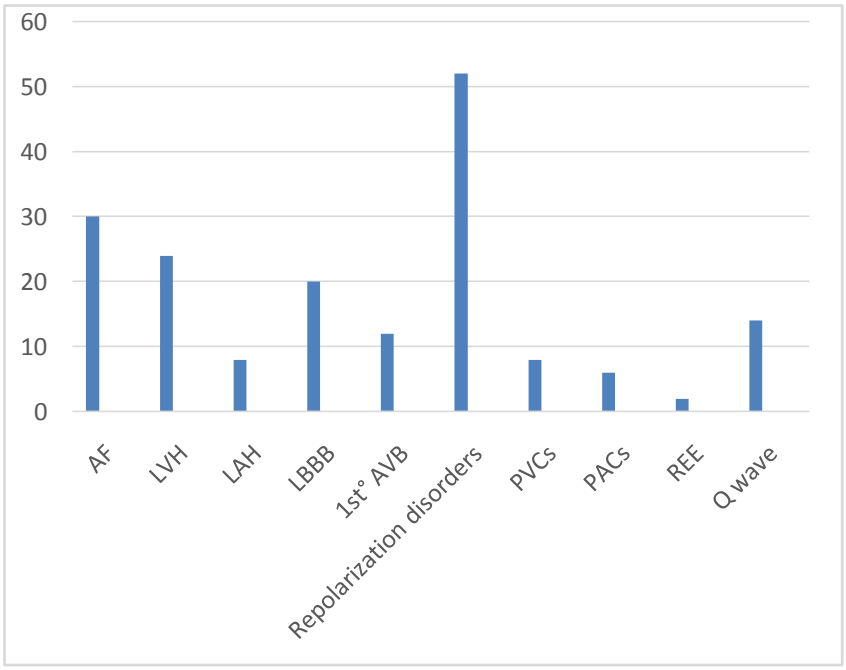

Figure1:- The main ECG abnormalities observed in HF in the study population.

AF: atrial firilation
LVH: left ventricular hypertrophy
LAH: Left atrium hypertrophy
LBBB: Left bundle brunch block
PVCs: premature ventricular contractions
PACs: premature atrial contractions
1st °AVB :1st degree atrio-ventricular block

3.Echocardiography :
All patients had a full echo evaluation which allows to categorize the patients according to the ejection fraction:48.9% had a Heart failure with reduced ejection fraction(HFrEF), 33.3% with preserved EF (HFpEF), and 17.8% with midly reduced ejection fraction (HFmrEF) (figure 2).The details are shown in table 2.

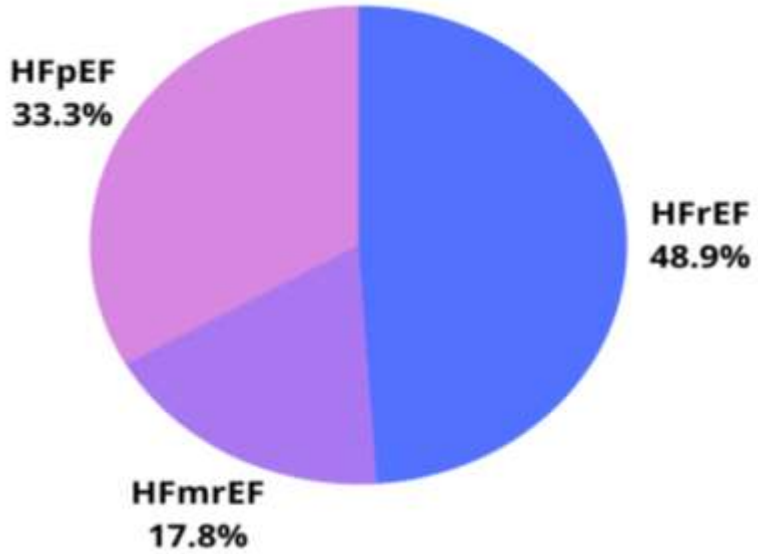

Figure 2:- The distribution of the different ranges of fraction ejection in the study population.

Table 2:- Echocardiographic features of the study population:

Characteristics	Values (N = 104)
DCM§	38 (44.2)
LVEF#	42.2 ± 15.1
EDD#	54.7 ± 12
ESD#	42.1 ± 12.9
WMA§	70 (76.1)
Significant valvulopathy§	22 (23.4)
Dilated LA§	80 (87)
LA surface#	25.5 ± 7.33
SPAP#	43.7 ± 18.7
Elevated LVFP§	42 (53.8)

#expressed inmean ± SD, §expressed innumber (percentage), DCM : dilated cardimyopathy, LVEF :left ventricular ejection fraction,EDD : end diastolic diameter, ESD : end systolic diameter, WMA : wall motion abnormalities, LA : left atrium, SPAP :systolic pulmonary artery pressure, LVFP : left ventricule filling pressure

Using logistic regression in univariate and multivariate analysis we tried to find a statistical association between the different cardiovascular risk factors and the evolution of heart disease to HF with reduced ejection fraction. Male sex and hypertension are the two characteristics associated with HFrEF (p-value <0.05).(Table 3)

Table 3:- The statistical association between risk factors and HFrEF.

Independents variables	Univariateanalysis			Multivariateanalysis		
	Beta	IC 95%	p	Beta	IC à 95%	p
Age	-0.007	0.937 ; 1.05	0.78	-0.0291	-0.9085 ; 1.038	0.043
Sex:						
Male - Female	-1.311	-2.601 ; 0.0210	0.27	-2.1006	0.0165 ; 0.910	**0.04**
DM	0.455	0.484 ;5.13	0.45	-0.1330	0.1824 ;4.201	0.86
HTN	1.118	0.968 ; 11.13	0.056	1.4630	0.8728 ; 21.370	**0.033**
Dyslipidemia	0.397	0.391 ; 5.65	0.56	0.0455	0.1758 ;6.231	0.96
Obesity	0.677	0.485 ; 7.99	0.34	0.2520	0.2075 ; 7.976	0.78
Smoking	-1.245	0.0276 ; 3	0.29	0.641	0.0878 ;41.085	0.68

HTN: arterial hypertension, DM: diabetes mellitus.

Discussion:-

Heart failure is a clinical syndrome resulting from impaired diastolic filling or systolic ejection of the cardiac ventricles [4]. It is the most common cardiovascular condition, reaching about 10% of subjects over the age of 80. Its frequency is increasing on the one hand because of the aging of the population, but also because of better management of certain cardiovascular pathologies such as myocardial infarction, arterial hypertension, valvulopathies, rhythm and conduction disorders, without however curing them [5,6].

HF is a rapidly growing public health problem with an estimated prevalence of >37.7 million individuals globally. The epidemiology of HF is highly variable across the world, with the lowest in sub-Saharan Africa [7-9]. The prevalence of HF in Europe appears to be 1–2% of adults [10-15]. Its incidence is about 5/1000 person-years in adults [1,16,17].

The highly increasing incidence of HF in the USA since the 1970s has been described as an epidemic [18-20]. An estimated 6 million American adults ≥20 years of age had HF. Prevalence is higher in women than men ≥80 years of age; overall prevalence is especially high in both Black females and Black males [8,9].

In Asia and Africa, especially north Africa where our study was conducted, there are a limited number of reports regarding the prevalence of HF. In Japan, it is estimated that 1.0 million individuals have HF [21,22]. In China, HF affects 4.2 million individuals with 500.000 new cases diagnosed every year [23,24]

The Prevalence of HF risk factors also varies worldwide, with hypertension being most common in Latin America, the Caribbean, Eastern Europe, and sub-Saharan Africa. Our study showed that HTN and DM are the main risk factors leading to Cardiovascular disease (CVD), especially HF.

Ischemic heart disease (HD) is most prevalent in Europe and North America. Valvular HD is more common in East Asia and Asia-Pacific countries [8,9].

Concerning our population, formerly dominated by the valvular HD, ischemic HD is becoming the first cause of HF. Our study confirms these findings.

It is generally believed that, of those with HF, about 50% have HFrEF and 50% have HFpEF/HFmrEF, mainly based on studies in hospitalized patients [1][25-28]. That was the case in our study with 48.9% having HFrEF and 51.1% separated between patients with HFpEF and HFmrEF.

Conclusion:-

Heart failure is a major public health problem that represents a challenge for the organization of medical care systems. Ischemic heart disease is the main etiology. The frequency and severity of this disease must encourage us to treat our patients as best we can, making the most of our resources and explaining in detail to patients the merits of each therapy. This should also encourage us to develop management structures such as a day hospital or specialized consultations to improve the prognosis of this severe pathology.

Consent:

The authors confirm that written consent for submission and publication of this case report including image(s) and associated text has been obtained from the patient.

Disclosure of Interest:

The authors declare that they have no competing interest.

Author Contributions:

All authors have contributed to the elaboration of the manuscript.

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