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Clinical Profile And Aetiological Pattern Of Chronic Heart Failure Patients In A Northwestern Nigeria Referral Centre

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Abstract
Background: *Chronic heart failure is a growing global problem with rising prevalence. The underlying cause, demography and clinical profile varies widely from one region of the world to the other and within the region(s) of the same country.*
Method: *The study was a cross sectional descriptive study carried out at a tertiary centre. Patient presenting with symptoms of heart failure in NYHA II-IV to the cardiac unit were recruited consecutively and details of clinical findings including 2D Echocardiography and ECG were obtained. Data was analysed using SPSS version 16.*
Result: *A total of 103 symptomatic chronic heart failure patients were recruited consisting of 34 (33%) males and 69 (67%) females with mean age of 42.81±16.41 years. The commonest cause of heart failure was systemic hypertension (48.5%). Most patients (61.2%) were in NYHA class II and 46 (44.7%) patients had normal BMI. Most patients (58.3%) had one form of arrhythmias or the other while 21.4% had heart blocks. 20.4% had systolic and diastolic dysfunctions, respectively. Combined systolic and diastolic dysfunction occurred in 66% of patients.*
Conclusion: *Chronic heart failure population in this study are mostly young, females and unemployed. Hypertension is the commonest cause. Improvement in socioeconomic status, awareness, health education and advocacy to curb the effect of hypertension is strongly advocated.*
Keywords : *Chronic heart failure, Aetiology, Clinical profile, prevalence*

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I. Introduction

Chronic heart failure remains a growing problem the world over with rising level of prevalence [1-3]. The underlying cause of heart failure, demographic, and clinical profile, however, varies widely from one region of the world to the other [4,5]. Interestingly this variation is also seen within the same region or country thereby undermining generalizability of certain research outcomes, national planning and policy making.

Northern Nigeria appears to display a characteristic aetiological pattern when compared with other parts of the country as reported from other centres [6,7]. The latest description of pattern of heart failure or cardiovascular disease from our centre dates to over four decades when echocardiography as an important tool for diagnosis was not yet in use [8]. Are there any differences as compared to other parts of the country and Africa? These and other reasons warranted this publication.

II. Material And Methods

The study was a cross sectional descriptive study carried out at the cardiac unit (outpatient clinic and medical ward) of a tertiary health facility in Northwestern Nigeria (Ahmadu Bello University Teaching Hospital, Zaria) which serves as a referral centre for several private and secondary health centres in the region and beyond. A total 82 symptomatic patient in NYHA II-IV who consented were recruited consecutively over a period of five months. Details of patients' biodata, clinical features, and necessary investigations were performed. Heart failure diagnosis was based on the Framingham's criteria [11]. Each patient had a resting ECG using a 12- lead ECG (Using MAC 1200 ST), and 2D echocardiography with Doppler study (Sonoscape SSI-8000 and Aloka SSD-1700) according to European Society of Echocardiography recommendation [12]. Analysis of data was done using statistical programme for social sciences (SPSS version-16 for Windows). Ethical approval from the Ahmadu Bello University Teaching Hospital's Health Research Ethical Committee was obtained for the study.

III. Result

Sociodemographic characteristics

Table 1 Sociodemographic and clinical variables.

Sociodemographic Variables				Clinical Variables			
		Frequency	Percentage			Frequency	Percentage
Sex	Male	34	33	Class	NYHA II	63	61.2
	Female	69	67		NYHA III	33	32
Occupation	Civil servants	13	12.6		NYHA IV	7	6.8
	Business	17	16.5	Duration of HF	<1yrs	42	40.8
	Famers	7	6.8		1-5yrs	56	54.4
	Unemployed	52	50.5		6-10yrs	4	3.9
Marital status	Single	3	2.9	BMI	Underweight (<18.5kg/m2)	15	14.6
	Married	99	96.1		Normal (18.5-24.9 kg/m2)	46	44.7
	Dicorced	1	1		Overweight (25-29.9 kg/m2)	21	20.4
Educational status	Primary	25	24.3		Obese I (30-34.9 kg/m2)	11	10.7
	Secondary	14	13.6		Obese II	3	2.4

A total of 103 symptomatic chronic heart failure patients were recruited consisting of 34 (33%) males and 69 (67%) females. The mean age of patients was 42.81±16.41 years with a statistically significant difference (ρ= 0.0001) between males (52.35±13.17 years) and females (38.10±15.6 years). Patients in the young age group (<45 years) constituted 54.4% of total while the elderly (≥65 years) were 13.6% (Table 1 and Figure 1).

Thirty-five (34.7%) patients had only Islamic education and 2 (1.9%) had no formal education. Fifty-two (51%) of the patients were unemployed constituting 69.6% of the female population and a total of 99 (96.1%) were married (Table 1).

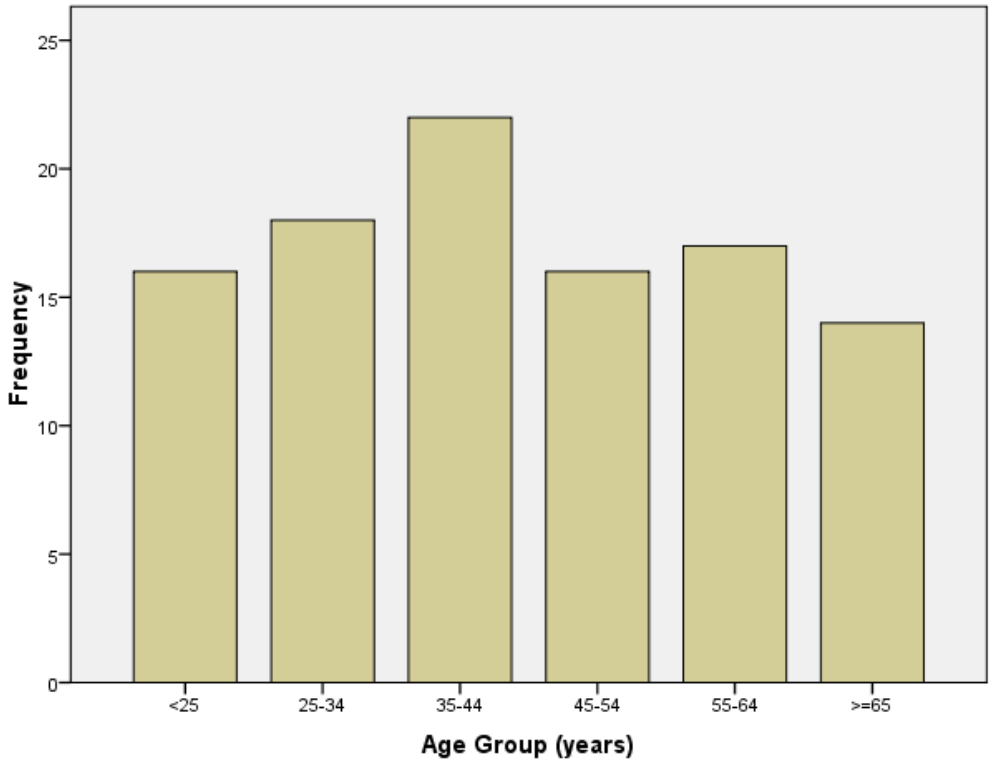

Figure 1 Showing age group of patients

Aetiology

The commonest cause of heart failure was systemic hypertension (48.5%). Also, common where peripartum cardiomyopathy (22.3%) and rheumatic valve disease (21.4%) while ischemic heart disease was least common (1.0%). The mean age of patients by heart failure aetiology was 53.94±12.56 years in the hypertensives, 31.55±10.98 years in rheumatic heart disease patients, 51.33±10.29 years in idiopathic DCM patients, 26.70±6.64 years in PPCM patients and 37.0 years in IHD patient (Table 2).

Table 2. Aetiology of heart failure.

Aetiology	Total n(%)	Males n(%)	Females n(%)	Mean age ±SD yrs	Mean BMI kg/m2	Mean duration of HF months
Hypertension	50(48.5)	21(61.8)	29(42)	53.94± 12.56	26.31± 5.62	26.73± 23.62
RHD	22(21.4)	6(17.6)	16(23.2)	31.55± 10.98	21.38± 3.94	21.09± 27.48
Idiopathic DCM	6(5.8)	5(14.7)	1(1.4)	51.33± 10.29	23.7± 2.39	13.67± 10.44
PPCM	23(22.3)	0(0)	23(33.3)	26.7± 6.64	22.24± 4.19	16.26± 15.40
IHD	1(1.0)	1(2.9)	0(0)	37.0	35.36	12.0
Others	1(1.0)	1(2.9)	0(0)	59.0	18.21	48.0

RHD : Rheumatic heart disaese. DCM : Dilated cardiomyopathy. PPCM : Peripartum cardiomyopathy. IHD : Ischaemic heart disease

Clinical characteristics

Most patients (61.2%) were in NYHA class II while only 6.8% were in class IV. Forty-six (44.7%) patients had normal BMI while equal number of patients (14.6%) were underweight and obese. Forty-two (40.8%) patients have had symptoms for less than 1year while 4 (3.9%) had symptoms for 6-10years (Table 1). Comorbidities including stroke, diabetes mellitus and obesity occurred in 23.3% of patients.

Most patients (58.3%) had one form of arrhythmias or the other while 21.4% had heart blocks with 11.7% having atrial fibrillation (Table 1). Seventy (68%) and 81 (78.6%) patients had enlarged left ventricular internal diameter in diastole (LVIDD) and left atrial diameter (LAD) respectively. 20.4% and 13.6% had systolic and diastolic dysfunction while combined systolic and diastolic dysfunction occurred in 66% of patients (Table 3). HFpEF was more common among the females as compared to males (17.4% vs 5.9% p=0.135). However no significant difference in the mean EF±SD (36.26± 13.42% vs 33.81± 9.72%, p= 0.295)

Table 3. Echocardiographic variables.

Parameters	Frequency(%)	Males	Females	ρ
Systolic dysfunction n(%)	21 (20.4)	9 (26.5)	12 (17.4)	0.206
Diastolic dysfunction n(%)	14 (13.6)	2 (5.9)	12 (17.4)	0.135
Systolic/diastolic dysfunction n(%)	68 (66.0)	23 (67.6)	45 (65.2)	
Mean LAD (Yrs)		4.64±0.68	4.43±0.83	0.162
Mean LVID (cm)		6.08±0.98	5.74±0.92	0.102
Mean EF (%)		33.81±9.72	36.26±13.42	0.295
Mean FS (%)		16.50±5.33	17.78±7.56	0.325

LAD : Left atrial diameter. LVID : Left ventricular internal diameter. EF : Ejection fraction. FS : Fractional shortening

IV. Discussion

Sociodemographic characteristics

The patients consisted of 34 (33%) males and 69 (67%) females with a male to female ratio of 1:2. The high percentage of females in this study reflects clinic attendance and hospital admission for heart failure in this centre. This can be attributed to high prevalence of peripartum cardiomyopathy (PPCM) in Zaria[13,14] which accounted for up to 36.7% of heart failure aetiology in females and 24.4% of total cause of heart failure. However, reports from other parts of Nigeria and some Sub Saharan African countries show a male preponderance and a corresponding low prevalence of PPCM [6, 10, 15-17]

The mean age of patients was 42.81±16.41 years which is lower than in most heart failure studies in Africa [6,15,17-25] and other parts of the world particularly developed countries where heart failure is a disease of the elderly with average age of 76 years [23,24]. The low mean age of patients may be because nearly half of the heart failure cases (43.7%) resulted from rheumatic valvular heart disease and peripartum cardiomyopathy (PPCM) with mean ages of 31.55years and 26.7years, respectively. A statistically significant difference between the mean age is also a representation of the high prevalence of PPCM earlier alluded to in the overall mean age of patients.

Majority of patients (54.4%) were found to be in the young age group (<45years). Although a reflection of the Nigerian population distribution by age, [25] it shows that this economically viable population at the prime of life are battling with a chronic progressive disease leading to shortened life expectancy, low productivity, and high health expenditure [26,27].

The study showed that over 36% of patients had no western or formal education which is a reflection of the incredibly low literacy level in Northwestern Nigeria and a high unemployed patient population [28]. This has direct impact on quality of care accessed by patients due to out of pocket health care financing. This finding is consistent with the INTERCHF study where African patients were most likely to be illiterate, lack health insurance and medication insurance [22]. Also in the largest study on PPCM risk factors (PEACE Registry) a condition predominant in Northern Nigeria by Karaye et al 29 lack of formal education, unemployment and poverty were identified, among others.

Aetiology

The commonest cause of heart failure was hypertension (44.4%) similar to earlier findings decades ago in the centre and reports from other parts of Nigeria and Africa [6,8,10,15-17]. However, this is different from the pattern in high income countries characterised by predominant ischaemic heart disease [4,27]. PPCM and RVD were the next commonest cause of heart failure accounting for 22.3% and 21.3% of cases respectively. This pattern of high PPCM cases among heart failure patients is rare in both the southern part and middle belt of Nigeria as well as other parts of Africa [10,15,22]. The high prevalence of PPCM in Nigeria is accountable almost completely by this region of the country and explains the preponderance of heart failure among females thereby contributing significantly to maternal morbidity and mortality rate. 29 Rheumatic valve disease still remains a major cause of heart failure similar to findings in other parts of northern Nigeria 6 unlike the reduced prevalence in southern parts of the country [15,17,30].

Clinical characteristics

Majority of patients (63.3%) were in NYHA class II while only 5.6% were in NYHA class IV. This was likely due to inclusion of outpatients which consisted largely of stable or mildly symptomatic patients in the study. Similar profile has been reported [31,32] except in cases of exclusive study of in-patients [10,33] where NYHA class III and IV predominated.

A total of 36 (35%) patients were either overweight or obese similar to reports in other heart failure studies [34,35]. Although majority (44.7%) of patients had normal BMI, a total of 15 (14.6%) patients were underweight which is an harbinger of cardiac cachexia a condition reported to occur in patients with chronic heart failure [36-39].

The number of patients who have survived with symptoms of heart failure were noted to be fewer with increasing duration of disease. This is in keeping with the high mortality associated with heart failure [11,40,41]. The high mortality rate can also be linked to the presence of co-morbidity [42] which was seen in 21% of patients.

There were arrythmias in 68.5% of patients using resting ECG. This is consistent with the findings from other studies [6,43,44]. This suggests that heart failure patients are highly proned to developing arrhythmias. In addition, majority of patients (66%) had combined systolic and diastolic dysfunction. Only 20.4% of patients had heart failure with isolated systolic dysfunction. In an earlier study conducted in the same centre by Oyati et al [45] 24.2% of patients had combined systolic and diastolic dysfunction while 30.5% had isolated systolic dysfunction. This disparity is due to the fact that only hypertensive heart failure patients were used in that study. In a similar study by Ojji et al [17] in North central Nigeria more patients had HFpEF (23.5% vs 13.6%) and fewer patients had HFrEF (76.5% vs 86.4%). This difference may be partly due to the wider range of heart failure aetiologies seen in the study and the prevalence of PPCM in our patients which is defined by the presence of systolic dysfunction [46].

The finding of a higher prevalence of HFpEF in females is consistent with the generally accepted pattern as seen globally despite the high prevalence of PPCM among our patient which is characterized by reduced ejection fraction [47,48].

V. Conclusion

Chronic heart failure population in our study consisted mostly of the young (less than 45yrs), predominantly females and unemployed. Although hypertension was the commonest cause of heart failure, RVHD and PPCM remain common place. Concerted effort through advocacy, health education/ awareness to reduce the menace of hypertension is strongly adviced.

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