

## Heart Failure Admissions in Medical Wards of a Nigerian Tertiary Hospital.

<sup>1</sup>Saidu Hadiza\*, <sup>2</sup>Umar Abdullahi, <sup>3</sup>Jamila A. Yau.

<sup>1</sup>Department of Medicine, Bayero University / Murtala Muhammad Specialist Hospital, Kano, Nigeria.

<sup>2</sup>Department of Medicine, Ahmad Sani Yariman Bakura Specialist Hospital, Gusau, Nigeria.

<sup>3</sup>Department of Medicine, Public Health and Diagnostic Institute, College of Medical Sciences, North – West University, Kano.

Corresponding Author: Dr. Hadiza Saidu,

---

### ABSTRACT

**Introduction:** Heart failure is a major clinical problem in the world, and is recognized as a contributor to cardiovascular disease burden in Africa. Previous study on the pattern and prevalence of heart failure among medical admissions in Kano was carried out about a decade ago. This study determined the prevalence, pattern and mortality rate of heart failure among patients admitted in to medical wards of Murtala Muhammad Specialist Hospital (MMSH) Kano, a tertiary hospital in North- Western Nigeria.

**Methods:** It was a retrospective, descriptive study. The admission and discharge registers of the medical wards from January 2016 to December 2016 were reviewed and analyzed using Statistical Package for Social Sciences (SPSS) version 19 software.

**Results:** A total of 1651 patients were admitted in to the Medical ward within the study period out of which 268 (16.2%) were admissions due to heart failure. Their age ranged 15 to 85 years (mean  $\pm$  SD, 49.28 $\pm$ 11.25 years). Hypertensive heart disease was the commonest cause, accounting for (43.7%), followed by peripartum cardiomyopathy (38.9%) and dilated cardiomyopathy (6.3%).

**Conclusion:** Our data show high prevalence of heart failure among patients admitted in to medical wards of MMSH, Kano. HHD, PPCM, and DCM were the main etiologies. There is therefore the need for strategies for the prevention, management of systemic hypertension in order to prevent its complications. There is also the need to carry out to further studies to understand PPCM and reasons for the rising incidence.

**Keywords:** Heart failure, Pattern, Mortality, Medical admissions, Kano.

---

Date of Submission: 27-09-2017

Date of acceptance: 10-10-2017

---

### I. Introduction

Heart failure is a chronic condition characterized by inability of the heart to pump adequate blood to meet the demands of the body and/ or doing so at increased filling pressures. It is a serious and major clinical problem worldwide, affecting approximately 5 million Americans and 0.4 – 2% of the general European population.<sup>1,2</sup> It has been recognized as a contributor to cardiovascular disease burden in Africa, and an important cause of hospital admission.<sup>3,4,5,6,7,8,9</sup>

Available data suggests that the etiologies of heart failure in Africa differ from those in the Western world.<sup>4</sup> The most common underlying cause of heart failure in high – income countries is coronary artery disease.<sup>10</sup> In sub – Saharan Africa, the predominant causes are hypertensive heart disease, rheumatic heart disease and cardiomyopathies.<sup>11,12,13</sup>

Previous studies in Africa have revealed a hospital admission rate of 3 – 7% which is similar to rate of developed countries of Western Europe and America.<sup>3</sup>

The aims of the present study were to determine the prevalence, pattern and mortality rate of heart failure among patients admitted in to medical wards of MMSH Kano, a tertiary hospital in North- Western Nigeria.

### II. Methods

This retrospective descriptive study was conducted in MMSH, Kano, Nigeria between January 2016 to December 2016. MMSH is a tertiary health institution established in 1928 and the largest Government owned hospital in Northern Nigeria. It is located within Kano metropolis, and is highly accessible to patients as no fees are charged for consultation and admission. It does not only serve the people of Kano State, but also neighboring states.

Admission and discharge records of the stated period were retrieved, and patients with clinical diagnosis of congestive heart failure (CCF) were identified. Information on socio-demographic and clinical parameters was extracted.

Heart failure was defined according to the recommendations of the European Society of Cardiology.<sup>14</sup> A patient was considered to have hypertensive heart failure on the basis of self-reported history of hypertension and or use of blood pressure (BP) lowering medications, documented BP of  $\geq 140/90$ mmHg or echocardiographic evidence of hypertensive heart disease.<sup>15</sup> Peripartum Cardiomyopathy (PPCM) was diagnosed based on the temporal relation of heart failure to last pregnancy and delivery as proposed in the European Society of Cardiology (ESC) working group on PPCM guidelines.<sup>16</sup> Dilated cardiomyopathy was defined by the presence of dilated left ventricle (with or without dilatation of the other three chambers) with global systolic dysfunction.<sup>17</sup> Rheumatic heart disease was diagnosed using World Heart Federation criteria.<sup>18</sup>

Cor pulmonale was said to be present when there is dilated and hypertrophied right ventricle and Doppler evidence of pulmonary hypertension.<sup>19</sup>

Ethical approval was obtained from the institutions health research ethics committee.

### **III. Data Analysis**

Data was analyzed using Statistical Package for Social Science (SPSS version 21.0). Continuous variables were presented as means  $\pm$  standard deviation. Qualitative variables were expressed as proportions and percentages. Comparisons of categorical variables were performed using chi – square test. A P value of  $<0.05$  was considered as statistically significant.

### **IV. Results**

Out of the 1651 patients admitted within the study period, 268(16.2%) patients had diagnosis of heart failure. The mean age of the subjects was  $49.28 \pm 11.25$  years, with 93(34.7%) of the study population being males and 175(63.3%) females, with aM: F ratio of 1:2. The commonest cause of heart failure identified was hypertension in 117(43.7%) followed by peripartum cardiomyopathy (PPCM) 107(38.9%) and idiopathic dilated cardiomyopathy (DCM) 16(6.3%). Among the females however, PPCM was the commonest cause accounting for 107(62.5%), followed by hypertension 50(28.6%) and RHD 9(5.1%). Table 1 describes the age and sex distribution of the causes of heart failure.

Forty two of the patients died while on admission, 29(69%) females and 13(31%) males. This constituted a mortality rate of 15.7%. Table 2 describes the death distribution among the causes of heart failure.

### **V. Discussion**

This study has assessed the aetiology and mortality rate of heart failure among admitted patients with heart failure.

The patients in this study were relatively young with a mean age of  $49.28 \pm 11.25$  years, similar to what was obtained in a previous study in same region, and in Accra, Ghana, on patients admitted with heart failure.<sup>20,21</sup> It is however in contrast to what was reported in Europe and US, with higher mean ages.<sup>22,23</sup> It is known that cardiovascular diseases occur a decade or two earlier in non – western countries than Western countries.

The commonest aetiology of heart failure was hypertensive heart disease, a finding similar to other studies in Nigeria.<sup>20,21,24</sup> Most patients are not aware of being hypertensive and even when diagnosis has been made, treatment is either not optimal or completely inadequate.<sup>25</sup> Cardiac complications remain the commonest complication of long standing hypertension in developing countries.<sup>4</sup> In comparison, the prevalence of hypertensive heart disease was significantly higher in males compared to females ( $P = 0.03$ ). This may be the reflection of higher prevalence of systemic hypertension among males compared to females.<sup>26</sup>

Peripartum cardiomyopathy constituted the second most frequent aetiology of heart failure seen in this study, accounting for 38.9%, and the commonest aetiology among females, accounting for more than half of cases (61.1%). This disorder has been recognized as an important cause of heart failure in Northern Nigeria particularly Zaria, Sokoto, Katsina and Kano.<sup>27,28,29</sup> A previous study in Kano reported a lower prevalence of 31.4% among heart failure admitted patients.<sup>20</sup> The higher prevalence in this study may be explained by the availability of the echocardiographic service in our center where due to very cheap services, patients from low socioeconomic status patronize. A similar high prevalence of up to 60% was reported in Sokoto State, among heart failure admitted patients.<sup>29</sup> The prevalence is however lower in other parts of the world. In South Africa, it was reported to be 1: 1000 live births, while in Haiti it was found to be 1: 300 live births.<sup>30,31</sup>

In the present study, patients with PPCM were found to be younger compared to other female patients ( $28.0 \pm 12.4$  years vs  $42.4 \pm 11.3$  years). This is in keeping with previous reports in Kano and Sokoto.<sup>20,29</sup> Patients from Zaria, South Africa and Haiti were however older than our patients.<sup>30,31,32</sup> with the mean age of the South African and Haiti patients being  $31.6 \pm 6.6$  years and  $31.8 \pm 8.1$  years respectively. Left ventricular thrombus

(LVT) was found in 12(14.9%) of the patients and 5(40.9%) had stroke. Previous studies Kano and Sokoto reported LVT rates of 60% and 12.3% respectively.<sup>20,29</sup>

Other important causes of heart failure include dilated cardiomyopathy, rheumatic heart disease, pericardial diseases and cor pulmonale, in agreement with earlier studies in Nigeria and other parts of Africa.<sup>21,27,33,34</sup> The lower prevalence of rheumatic heart disease (5.2%), when compared with earlier studies may be attributed to the modest improvement in health care delivery system and improved sanitation in this region.<sup>35,36</sup>

Forty two patients (15.7%) died while on admission, 29(69%) females and 13(31%) males, with statistically significant gender difference ( $P = >0.001$ ). This could be explained by the high prevalence of PPCM among the women, which is associated with high mortality. Some previous reports however show higher mortality in men with heart failure than women.<sup>20,37</sup>

Our study has a number of limitations. Being a retrospective study, there were missing data and incomplete medical records. In addition, there is lack of facilities for coronary angiography as well as postmortem evidence on deaths.

## **VI. Conclusion**

The commonest aetiology of heart failure among all patients and males was hypertensive heart disease. Peripartum cardiomyopathy and rheumatic heart disease were the commonest causes of heart failure among females, while coronary artery is a rare cause of heart failure in this population.

## **AUTHORS' CONTRIBUTIONS:**

SH conceived the study, participated in the study design, data acquisition and drafted the manuscript. UA Participated in the study design, statistical analysis and supervision of the manuscript writing. JAU Participated in the study design, data collection and supervision of the manuscript writing.

## **Acknowledgment**

We acknowledge Dr. Kabir Abdulwahab, Dr. Maryam Lawal and Dr. Sulaiman Ibrahim for their assistance in data collection.

## **References**

- [1]. Hunt SA, Abraham WT, Chin MH, Feldman AM, Francis GS, Ganiats TG, et al. ACC/AHA 2005 guideline update for the diagnosis and management of chronic heart failure in the adult: a report of the American College of Cardiology/ American Heart Association Task Force on practice guidelines [http://content.onlinejacc.org/cgi/reprint/46/6/eI].
- [2]. The Task Force for the diagnosis and Treatment of Chronic Heart Failure of the European Society of Cardiology: Guidelines for the treatment and diagnosis of Chronic Heart Failure: an executive summary (update 2005). *Eur Heart J* 2005; 26: 1115 – 1140.
- [3]. Damasceno A, Cotter G, Dzudie A, Silwa K, Mayosi BM. Heart failure in sub – Saharan Africa: time for action. *J Am Coll Cardiol* 2007; 50: 688 – 693.
- [4]. Toure IA, Salissou O Chapko MK. Hospitalizations in Niger for complications from arterial hypertension. *Am J Hypertens* 1992; 5: 322 – 324.
- [5]. Oyoo GO, Ogola EN. Clinical and sociodemographic aspects of congestive heart failure patients in Kenyatta National Hospital. *Nairobi. East Afr Med J* 1999; 76: 23 – 27.
- [6]. Bardgett HP, Dixon M, Beeching NJ. Increase in hospital mortality from non – communicable disease and HIV related conditions in Bulawayo Zimbabwe, between 1992 to 2000. *Trop Doct* 2006; 36: 129 – 131.
- [7]. Kingue S, Dzudie A, Menanga A, Akono M, Ouankou M. A new look at adult chronic heart failure in the age of the Doppler echocardiography: experience of the medicine department at Yaoundé General Hospital. *Ann Cardiol Angeiol* 2005; 54: 276 – 283.
- [8]. Khatibzadeh S, Farzadfar F, Oliver J, Ezzati M, Moran. Worldwide risk factors for heart failure: A systematic review and pooled analysis. *Int J Cardiol* 2013; 168: 1186 – 1194.
- [9]. Schocken DD, Benjamin EJ, Fonarow GC, Krumholz HM, Levy D. Prevention of heart failure: a scientific statement from the American Councils on Epidemiology and Prevention , Clinical cardiology, Cardiovascular nursing and high blood pressure research; Quality of care and Outcomes of Research Interdisciplinary Working Group; and Functional Genomics and Translational Biology. *Circulation* 2008; 117: 2544 – 2565.
- [10]. Owosu IK. Causes of heart failure as seen in Kumasi, Ghana. *The Int J Third World Med* 2007; 5: 1 – 10.
- [11]. Mendez GF, Cowie MR. The epidemiological features of heart failure in developing countries: a review of the literature. *Int J Cardiol* 2001; 80: 213 – 219.
- [12]. Yamani M, Massie BM. Congestive heart failure: insights from epidemiology, implications for treatment. *Mayo Clin Pract* 1993; 68: 1214 – 1218.
- [13]. Pearson GD, Veille JC, Rahimtoola S. Peripartum cardiomyopathy: National Heart, Lung and Blood Institute and Office of Rare Diseases ( National Institute of Health) workshop recommendations and review. *JAMA*. 2000; 283: 1183 – 1188.
- [14]. The Task Force for the Diagnosis and Treatment of Chronic Heart Failure of the European Society of Cardiology. Guidelines for the treatment and diagnosis of chronic heart failure: an executive summary (update 2005) *Eur Heart J* 2005; 26: 1115 – 1140.
- [15]. Ganau A, Devereux RB, Roman MJ, G de Simone, Pickering TG, Saba PS, Vargiu P, Simongini J, Laragh JH: Pattern of left ventricular hypertrophy and geometry in essential hypertension. *J Am Cardiol* 1992, 19: 1550 – 8.
- [16]. SliwaK, Hilfiker – Kleino D, Petrie MC etal, “Current state of knowledge on etiology, diagnosis, management and therapy of peripartum cardiomyopathy: a Position statement from the Heart failure Associations of the European Society of Cardiology Working Group on peripartum cardiomyopathy.” *European Journal of Heart failure* 2010;8: 767 – 778.
- [17]. Cardiomyopathies: Report of a WHO Expert Committee. *World Health Organ Tech Rep Ser* 1984; 697: 7 – 64.

- [18]. Remenyi N, Wilson A, Steer A, et al. "World Heart Federation criteria for echocardiographic diagnosis of rheumatic heart disease – an evidence based guidelines." *Nature Reviews Cardiology*, 2012; 9: 297 – 309.
- [19]. Jaffe CC, Weltin G. Echocardiography of the right side of the heart. *Cardiol Clin*.1992; 10; 41 – 57.
- [20]. Kamilu M Karaye, Mahmud U Sani. Factors associated with poor prognosis among patients admitted with heart failure in a Nigerian tertiary medical center: a cross – sectional study. *BMC Cardiovascular Disorders* 2008; 6:16.
- [21]. Amoah AG, Kallen C. Aetiology of heart failure as seen from a cardiac referral center in Africa. *Cardiology* 2000; 93(1): 11 – 18.
- [22]. Dike BO, Esquivel J, Dracup K. Effect of gender, ethnicity, pulmonary disease and symptom stability on hospitalization in patients with heart failure. *Am J Cardiol* 2007; 100: 1139 – 1144.
- [23]. Lenzen MJ, Rosengren A, Scholte OP, Reimer W, Follath F, Boersma E et al. Management of patients with heart failure in clinical practice: Differences between men and women. *Heart in press*. 2007 June 17.
- [24]. Dike BO, Jacob A, Samuel OA, Manmark HM, Ayodele OF. Pattern of heart failure in Abuja, Nigeria: an echocardiographic study. *Cardiovascular Journal of Africa* 2009; 20(6)349 – 352.
- [25]. Onwuchekwa AC. Problems of hypertensive care in Nigeria. *Niger Med Pract*. 1996;31: 94 – 96.
- [26]. Non – Communicable diseases in Nigeria. Final Report of National Survey. Federal Ministry of Health - National Expert Committee on NCD; 1997.
- [27]. Karaye KM, Sani MU, Mijinyawa MS, Borodo MM. Aetiology and echocardiographic features of heart failure with preserved and reduced ejection fraction in Kano, Nigeria. *Nigerian Journal of Basic and Clinical Sciences* 2007; 4(1 – 2) : 11 – 17.
- [28]. Antony KK. Pattern of cardiac failure in Northern Savannah, Nigeria. *Trop Geogr Med* 1980; 32 (3):118 – 125.
- [29]. Isezuo SA, Abubakar SA. Epidemiologic profile of postpartum cardiomyopathy in a tertiary care hospital. *Ethn Dis* 2007; 17(2)228 – 233.
- [30]. Silwa K, Forster O, Libherber E, Fett JD, Sundstrom JB, Hilfiker - Kleiner D, Ansari AA. Peripartum cardiomyopathy: inflammatory markers as predictors of outcome in 100 prospectively studied patients. *Eur Heart J* 2006; 27: 441 – 446.
- [31]. Fett JD, Chrutie LG, Carraway RD, Murphy JG. Five year prospective study of the incidence and prognosis of peripartum cardiomyopathy at a single institution. *Mayo Clin Proc* 2005; 80(12)1602 – 1606.
- [32]. Davidson NM, Parry EH. Peripartum cardiac failure. *Q J Med* 1978; 47(188): 431 – 461.
- [33]. Ayoo GO, Ogola EN. Clinical and socio – demographic aspects of congestive heart failure patients at Kenyatta National Hospital, Nairobi. *East Afr Med J* 1999; 76(1):23 – 27.
- [34]. Familoni OB, Olunuga TO, Olufemi BW. A clinical study of pattern and factors affecting outcome in Nigerian patients with advanced heart failure. *Cardiovascular J Afr* 2007; 18: 308 – 311.
- [35]. Abengowe CU. Cardiovascular disease in Northern Nigeria. *Trop Geogr Med*1979; 31:553 – 560.
- [36]. Danbauchi SS, Alhassan MA, David SO, Wammanda R, Oyat IA. Spectrum of rheumatic heart disease in Zaria, Northern Nigeria. *Ann Afr Med* 2004;3: 17 – 21.
- [37]. Jalal KG. Sex related differences in Heart Failure and Beta blockers. *Heart Fail Rev* 2004; 9: 149 – 159.

**Table 1: Age and Sex distribution of the causes of heart failure.**

| Aetiology of Heart failure<br>± SD(years) | Mean age  | M  | F   | Total | %      | Sex difference |
|---|-----------|----|-----|-------|--------|----------------|
| HHD                                       | 52.0±11.9 | 67 | 50  | 117   | 43.70  | 0.03           |
| PPCM                                      | 28.0±12.4 | -  | 107 | 107   | 38.9   | -              |
| DCM                                       | 47.4±6.50 | 16 | 12  | 4     | 6.3    | <0.001         |
| RHD                                       | 27.9±11.1 | 5  | 914 | 5.2   | <0.001 |                |
| Cor Pulmonale                             | 42.8±7.90 | 6  | 2   | 8     | 2.8    | <0.001         |
| PCD                                       | 29.2±9.6  | 3  | 3   | 6     | 2.4    | 0.96           |

Key: HHD, hypertensive heart disease; PPCM, peripartum cardiomyopathy; DCM, dilated cardiomyopathy; RHD, rheumatic heart disease; PCD, pericardial disease.

**Table 2: Distribution of death among the causes of heart failure.**

| Aetiology of heart failure | No of death (n) | Percentage (%) |
|----------------------------|-----------------|----------------|
| Hypertensive heart disease | 12              | 28.6           |
| Peripartum cardiomyopathy  | 28              | 66.6           |
| Dilated cardiomyopathy     | -               | -              |
| Rheumatic Heart disease    | 1               | 2.4            |
| Cor Pulmonale              | 1               | 2.4            |
| Pericardial disease        | -               | -              |

\*Saidu Hadiza. "Heart Failure Admissions in Medical Wards of a Nigerian Tertiary Hospital." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)* 16.10 (2017): 63-66