



## Pattern of Heart Failure in an Adult Kenyan Population

Julius Ogeng'o<sup>1</sup>, Patrick M Gatonga<sup>1</sup>, Beda O Olabu<sup>1\*</sup> and Nafula M Ogeng'o<sup>1</sup>

<sup>1</sup>Department of Human, University of Nairobi, Nairobi, Kenya

\*Corresponding Author: Beda O. Olabu, Department of Human, University of Nairobi, P.O. Box 00100 – 30197 Nairobi, Kenya, E-mail: [otienobeda@gmail.com](mailto:otienobeda@gmail.com)

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### Abstract

**Background:** Pattern of heart failure shows geographical and ethnic variation. These data are important for informing management strategies. There are no recent reports from Kenya.

**Objective:** To describe the pattern of heart failure in a black Kenyan population.

**Materials and Methods:** This was a prospective study of 116 adult black patients with clinical and laboratory diagnosis of heart failure at a National and regional referral hospital in Kenya between January – November, 2011. Patients were analyzed for cause, age and gender distribution.

**Results:** The causes of heart failure were cardiomyopathy (18.1%) hypertensive heart failure (15.5%), vulvular heart disease (12.9%), ischaemic heart disease (9.5%), anemia (7.7%). Mean age was 52.2 years. Over 40% of the patients were below 40 years. There was no gender difference.

**Conclusion:** Heart failure is still predominantly non ischemic but coronary heart disease has assumed greater prominence over the last 10-15 years. It affects younger individuals with no gender bias. Control measures should target both non ischaemic and ischaemic causes and commence early.

### Key words:

Heart failure; Ischemic heart disease; Kenya

### Introduction

Pattern of heart failure shows geographical, national and regional [1,2] ethnic, gender and age [3] differences. These data are important for informing prevention, treatment policies and programmes [1]; identifying modifiable biological and social determinants to reduce cardiovascular health disparities in vulnerable age groups [3]; needs of health care providers, allocating resources, developing comprehensive heart failure outreach programs and formulating policies to reduce these differences [4].

In Sub-Saharan Africa although ischemic heart disease is reported to be increasing, studies on the pattern and especially the causes, of heart failure continue to be scarce and disparate. In Kenya, the last available study was done nearly 15 years ago [5]. This does not reflect current

risk factor profiles [6] and the data cannot inform contemporary management strategies. Indeed, a recent autopsy study reveals that ischaemic heart disease, previously considered rare [7] has become more prominent [8]. This study therefore evaluated the pattern of heart failure in an adult black Kenyan population.

### Materials and Methods

This was a prospective study done between January and November, 2011 at Kenyatta National Hospital, an 1800 capacity regional referral hospital in Nairobi, Kenya. The hospital has an annual patient turnover of 80,000 patients, 120 cardiovascular beds and 10 cardiologists. Ethical approval was granted by Kenyatta National Hospital/University of Nairobi Ethics and Research committee. All patients who were diagnosed with congestive heart failure stage II – IV on the basis of clinical presentation were included in the study. The clinical features were considered on the basis of New York Heart Association (NYHA) criteria shown below.

Class	Clinical feature
I	Asymptomatic
II	Fatigue, palpitation or dyspnea with ordinary physical activity
III	Fatigue, palpitation or dyspnea on mild exertion
IV	Fatigue, dyspnea and palpitation at rest

Table 1: Clinical features on the basis of New York Heart Association (NYHA).

Patients in class III and IV also showed raised jugular venous pressure, pedal edema, hepatomegaly and pulmonary edema. The main investigations done were full haemogram, serum urea and electrolytes, echocardiography, electrocardiography and pulmonary function tests. The patients were categorized into males and females and into age groups of 10 years starting at 10 years. Each gender and age group were analyzed for single major cause or comorbidity of heart failure. The data were analyzed for frequencies, means, standard deviations using SPSS windows version 17.0. Ninety five percent level of confidence was applied where  $p < 0.05$  was taken as significant. Data are presented in tables, histograms and pie charts.

### Results

Majority of the patients (46.5%) came in class IV heart failure, (32%) in class III, (11.5%) in class II, while (10.3%) were detected on examination and investigation,

### Causes/comorbidities

The most frequent causes of heart failure were cardiomyopathy (18.1%), hypertension (15.5%), diabetes (14.7%), vulvular heart disease (12.9%) and myocardial infarction (9.5%) (Table 1).

### Age and gender distribution

The mean age was 52.2 years. Fifty one percent of the patients were aged below 50 years, with 25% being under 40 years. The male:female ratio was 1:1 without a difference in age groups (Table 2).

Cause	Sex		Total	(%)	p-value of sex diff
	Male	Female			
Cardiomyopathy	9	12	21	(18.1)	0.734
Hypertension	10	8	18	(15.5)	0.621
Diabetes	9	8	17	(14.7)	0.753
Vulvular heart disease	7	8	15	(12.9)	0.123
Myocardial infarction	6	5	11	(9.5)	0.536
Anaemia	4	5	9	(7.7)	0.625
HIV	3	5	8	(6.9)	0.724
Other infections	3	4	7	(6.0)	0.646
Renal disease	4	3	7	(6.0)	0.563
Connective Tissue Disease	1	2	3	(2.6)	0.563
Total	56	60	116	(100)	

Table 1A: Causes of heart failure in adult Kenyan population.

Condition	Mean age
Cardiomyopathy	49.7
Hypertension	54.7
Diabetes	58.3
Vulvular heart disease	31.5
Myocardial Infarction	52.8
Anaemia	45.3
HIV	39.5
Other infection	46.3
Renal disease	64
Connective tissue disease	44.5

Table 2: Mean ages of various causes of heart failure.

## Discussion

The majority of patients presented in stage III and IV, this is similar with the clinical picture in other studies in African countries [5,9]. These workers also found that hospital stay increases with severity of

Author	Country	Cause of Heart Failure %					
		HTN	CMP	RHD	PC	IHD	CHD
Stewart et al. [11]	South Africa (Black)	33	28	8	-	9	-

disease at presentation. This late presentation is related with availability of health care facilities provision of health care facilities and education should be enhanced

Age group	Frequency (%)		Total (%)
	Male	Female	
11 – 20	2	2	4 (3.4)
21 – 30	3	5	8 (6.9)
31 – 40	8	10	18 (15.5)
41 – 50	14	17	29 (25)
51 – 60	14	16	30 (25.9)
61 – 70	7	6	13 (11.2)
71 – 80	5	3	8 (6.9)
>80	5	1	6 (5.2)
Total	56	60	116 (100)

Table 3: Age distribution of heart failure in an adult Kenyan Population.

## Causes

Majority of causes of heart failure are non ischaemic [10]. The current study reveals that 9.5% of the cases were ischemic, compared to 1999, where only 2.2% were ischemic [5] This is comparable to some African states, who report close to 10% ischemic cases [11,12]. Table 4 indicates that the causes vary between countries but remarkably, that ischemic heart disease are already prominent in some African countries like Congo [13], Sudan [14] and Djibouti [15].

## Age and Gender distribution

The mean age of 44.6 is comparable to those reported from other African countries, but two decades earlier than in Caucasian populations (Table 5). This supports assertions that heart failure occurs earlier among black population [21]. A notable observation is that over 50% of the cases occur in individuals 50 years and below. This is at variance with the earlier study which revealed that only 25% of victims were below 50 years [5]. This implies that heart failure is occurring earlier, concordant with literature review findings that in Africa, heart failure is a disease of young people [22]. This implies that control measures should be instituted from the second decade.

The 1:1 male: female distribution observed in the current study is also at variance with the earlier study which revealed male predominance [5]. It is, however, concordant with findings from several African countries [22]. It implies that the factors responsible are applicable to men and women equally.

Onwuchekwa and Asekomeh [16]	Nigeria	56.3	12.3	4.3	-	0.2	-
Tantchow et al. [17]	Cameroon	15	32	35	7	-	3
Amoah and Kallen [12]	Ghana	21.3	16.8	20.1	-	10	9.8
Suliman [14]	Sudan	28	11	7	4	65	-
Belete et al. [18]	Ethiopia	24.2	20.2	32.8	-	12.0	-
Kwan et al. [19]	Rwanda	8.0	54	25	1.4	-	5
Soliman and Juma [20]	Malawi	24	19	34	14	-	4.4
Ikama et al. [13]	Congo	34.5	7.6	9.4	-	25.6	-
Oyoo and Ogolla [5]	Kenya	17.2	25.2	32	13.2	2.2	-
Massoure et al. [15]	Djibouti	18	7	13	-	62	-
Current study	Kenya	15.5	18.1	12.9	-	9.5	-

Table 4: Causes of heart failure caused by ischemic heart disease.

Author	Country/population	Mean age (SD)
Adebayo et al. [23]	Nigeria	52.3 (16.64)
Seni et al. [24]	USA	77.3 (12.1)
Logeart et al. [25]	French	77
Zarrinkoub et al. [26]	Sweden	77 (13)
Kingue et al. [27]	Cameroon	57
Cabral et al. [28]	Senegal	42.5
Albert [29]	South Africa	55 (16.0)
Owusu [30]	Ghana	58 (16.48)
Damascene et al. [10]	Subsaharan Africa	52.3 (18.3)
McIntyre et al. [31]	9 countries (Scotland)	75
Current study	Kenyan	44.6

Table 5: Mean age of heart failure reported in various studies.

## Conclusion

Heart failure is still predominantly non ischemic but coronary heart disease has assumed greater prominence over the last 10-15 years. It affects younger individuals with no gender bias. Control measures should target both non ischemic and ischemic causes and commence early.

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