



# MORTALITY PATTERN OF CARDIOVASCULAR DISEASES IN THE MEDICAL WARDS OF A TERTIARY HEALTH CENTRE IN A RURAL AREA OF EKITI STATE, SOUTHWEST NIGERIA.

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## ABSTRACT

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**Objective:** To determine the basic demographic patterns of cardiovascular diseases, deaths, and the frequency of clinical causes of deaths in medical wards of a tertiary health centre in a rural area, south west Nigeria.

**Materials and methods:** Retrospective analysis of patients' records admitted into the medical wards of Federal Medical Centre IdoEkiti, Ekiti State, South west Nigeria were conducted. The study subjects were patients of 16 years and above who died of cardiovascular diseases from January 2009 to December 2012. Data analysis was done using SPSS Version 16.

**Results:** A total of 681 patients with cardiovascular diseases were admitted in medical wards within the study period, of which 70 died with crude mortality rate of 10.3%. Male mortality were 30 (42.9%) and females 40 (57.1%) ratio 1:1.3. The age range was 25 – 100 years with mean of  $66.4 \pm 16.3$  years, with more deaths occurring in the elderly (72%). The most frequent cause of deaths was stroke (68.6%).

**Conclusion:** Females contributed the highest number of cardiovascular disease admission and crude mortality. Stroke was responsible for over half of cardiovascular deaths, and hypertension was the commonest aetiological factors of cardiovascular disease deaths.

**Key words:** Mortality, Hospital, Cardiovascular diseases, Nigeria.

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*"African countries are predominantly rural; data on cardiovascular mortality are rarely available particularly in relation to rural setting. This article provided a bridge"*

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## INTRODUCTION

The burden of cardiovascular disease (CVD) globally is enormous and growing, and the majority of those affected are in developing countries.<sup>1, 2</sup> New World Health Organization (WHO) report<sup>3</sup> made it known that CVD account for most non-communicable disease (NCD) deaths and nearly 80% of these NCD deaths occurred in low-and middle-income countries.

Nigeria is one of the many developing countries in the world that the population based is still predominantly rural.<sup>4</sup> Level of mortalities is especially high in rural areas where coverage by public health services is low. Hospital based data had been found to be useful, feasible and readily available particularly in sub-Saharan Africa.<sup>5</sup> Likewise, these data when applied properly can reflect the patterns of illness in the communities sub served by the health institution. However, there are scarce published data from the rural hospital settings (few from urban centers have focused on cardiovascular disease). Virtually all tertiary health centers where clinical research regularly takes place are located in the urban areas in Nigeria. In view of the necessity for sound planning and sector-wide approach to health care issues we chose to conduct this study in rural areas and we aimed to investigate the basic demographic patterns of cardiovascular diseases and mortality in a rural area of Ekiti State, Southwest Nigeria.

## MATERIALS AND METHODS

A retrospective analysis was carried out on a 4-year record of patients with cardiovascular diseases admitted into male and female medical wards of the department of Internal Medicine, Federal Medical Centre Ido-Ekiti, Ekiti State, Southwest, Nigeria. Ido-Ekiti is a rural community located about 30km from Ado-Ekiti, the state capital. Federal Medical Centre IdoEkiti is the leading referral centre in the state with a population of about 2.4million people. The

people from neighbouring states. It is a teaching hospital to the Faculty of Health Sciences of AfeBabalola University in Ado Ekiti, Ekiti State, Nigeria. It has more specialists and other relevant personnel as well as better facilities when compared to one other state owned tertiary health hospital in the state, located in the state capital.

The retrospective review included all cardiovascular diseases admitted from January 2009 to December 2012 (4 years). The populations under study were adults of 16 years and above. Records available on the wards (nurses report books), case notes from the medical records department of the hospital were all utilized. All cardiovascular deaths occurring within the period of study were reviewed. In this study, cardiovascular disease was defined as disease that affects the heart and blood vessels.<sup>6</sup> Ethics and research committee approval from the institution was obtained. Data obtained were analysed using SPSS Version 16 software and the results presented in the descriptive and tabular forms.

## RESULTS

A total of six hundred and eighty one (681) patients with cardiovascular diseases were admitted into male and female medical wards within the 4years period of study as shown in table 1. These consist of 320 (47.0%) male and 361 (53.0%) females with male to female ratio 1.0 to 1.1. Throughout the period studied, there were higher numbers of females admitted compared to males. In table 2, the total deaths recorded over the period were 70 with a crude mortality rate of 10.3%. Male deaths were 30 (42.9%) and female deaths were 40 (57.1%), with a ratio of 1 to 1.3. The crude mortality rate for male and female were 9.4% and 11.1% respectively. The age ranges were 25 years to 100 years with the mean of  $66.4 \pm 16.3$  years. Number of deaths increased with age, whereas on gender basis it was worse in the

young and the elderly aged groups, in the middle aged deaths were worse in the males than females. Stroke recorded over half clinical causes of deaths (68.6%) as shown in table 3. In table 4, frequency of cardiovascular deaths per year was relatively similar (15 to 20 deaths per year).

Table 1: Patients admitted for cardiovascular diseases from January 2009 to December 2012

Gender	2009	2010	2011	2012	Total
Male	76 (49.0%)	78 (43.3%)	73 (46.8 %)	93 (48.9%)	320 (47.0 %)
Female	79 (51.0%)	102 (56.7%)	83 (53.2 %)	97 (51.1%)	361 (53.0 %)
Total	<b>155</b> <b>(100.0%)</b>	<b>180</b> <b>(100.0%)</b>	<b>156</b> <b>(100.0%)</b>	<b>190</b> <b>(100.0%)</b>	<b>681</b> <b>(100.0%)</b>

Table 2: Age and sex distribution of cardiovascular deaths between 2009 and 2012

Age Groups (Years)	Male		Female		Total	
	N	(%)	N	(%)	N	(%)
16-44	0	(0)	2	(5.0)	2	(2.8)
45-64	11	(36.7)	6	(15.0)	17	(24.3)
≥ 65	19	(63.3)	32	(80.0)	51	(72.9)
Total	<b>30</b>	<b>(100.0)</b>	<b>40</b>	<b>(100.0)</b>	<b>70</b>	<b>(100.0)</b>

Table 3: Cardiovascular mortality per year.

Year	Mortality N(%)
2009	15 (21.4)
2010	20 (28.6)
2011	18 (25.7)
2012	17 (24.3)

## DISCUSSION

Scientific information from the hospital can be extrapolated to provide health information about people in the geographical environment it serves.

Table 4: Clinical causes of patients' deaths.

Causes	Number	%
Stroke	48	68
Heart Failure	16	22.9
Hypertensive Crisis (Other than stroke & heart failure)	6	8.6
Total	<b>70</b>	<b>100.0</b>

Recent reports had shown that deaths from non-communicable diseases affects higher proportion of people communicable diseases affects higher proportion of people during their prime working years especially in the low income regions.<sup>[3,7,8]</sup> This study revealed that more females were admitted for cardiovascular diseases when compared to males. This was in contrast to previous report by Ansa et al<sup>9</sup> in the admission patterns in the medical centres located in the city, where the reverse was true. However, the findings in this study may not be unconnected with the fact that occupation in rural areas is predominantly crude farming where males play a vital role in productivity. Therefore, males are likely to decline admission into medical wards if stable after treatment in accident and emergency section, since they are the bread winners of their family. Higher female admission may also be due to unpublished observations whereby females are easier to convince and educate on the need for medical admission compared to males. The low number of admitted cases of CVD per year may be due to under utilization of the health facility as a result of poverty and ignorance rather than low prevalence of cardiovascular diseases.

Over 70% of cardiovascular deaths occurred in the elderly as seen in this study. This is in agreement with other studies and already known facts that cardiovascular morbidity and mortality increase with age.<sup>10-13</sup> These patterns may point to

related increase is due to the fact that longevity prolongs the time exposure to risk factors resulting in great probability of CVD in the older age group. The crude mortality rate in this study (10.3%) was high. The late presentation may account for this, and therefore advanced and complicated cases are likely to die particularly in a situation with limited facilities and personnel. The crude mortality rate on gender basis was higher in females (11.1%) than male (9.4%). This is in contrast to earlier reports of more CVD deaths in males more than females.<sup>14,15</sup>

Nevertheless, our findings may be due to previous report which observed that most women usually attend hospital only when complication had set in<sup>16</sup> hence, lack of early cardiovascular care might have contributed to higher mortality. The annual cardiovascular deaths remain high (21.4 – 24.3%) within the study period. This may be due to lack of access to early cardiovascular care as a result of poverty, ignorance, poor transportation system and lack of access to emergency cardiovascular care.

The commonest cause of cardiovascular deaths in this study was stroke. This is in agreement with previous findings.<sup>7,8,17</sup> The major causes of stroke in decreasing order includes: Hypertension (63%), unidentified causes (16%), hypertension and Diabetes Mellitus combined (10%), Diabetes Mellitus (7%), and heart disease (4%). The high prevalence of hypertension may reflect poor state of hypertension control which has been known to be the commonest aetiological factor in stroke.<sup>18,19</sup> Unidentified causes were mainly due to incomplete evaluation resulting from lack of fund for appropriate investigations and sometimes death before investigation was concluded. Ischemic stroke was responsible for 86% of deaths from stroke while 14% were haemorrhagic.

The high death rate from stroke suggests poor health care service availability for the treatment of this condition. Other conditions that are lacking include: Integration of public health education, emergency dispatch, prehospital detection and triage, hospital stroke system development, stroke unit management, creation of stroke centers and establishment of effective rapid response team. Furthermore, improvement in the use of appropriate fibrinolytic therapy for over the past 5 years in the developed countries, which is lacking in the developing countries, might have also contributed.

The second most common cause of cardiovascular deaths was heart failure (22.9%). Late referral or presentation and lack of fund as well as ignorance to access early cardiovascular care may account for high heart failure deaths. Previous study as reported late referral as a contributing factor to heart failure mortality.<sup>20</sup> The commonest cause of heart failure identified in this study was hypertension (40%). This was similar to findings by Adedoyin et al<sup>21</sup> and Onwuchekwa et al.<sup>22</sup> Other causes of heart failure as seen in this study in decreasing order include: Unidentified causes (22%), Dilated cardiomyopathy (15%), Rheumatic heart disease (8%), Chronic obstructive pulmonary disease (6%), renal failure (5%), HIV/AIDS (2%), Ischemic heart disease (1.5%), congenital heart diseases (0.5%).

Hypertensive crisis as a cause of deaths other than stroke and heart failure was found in 8.6% of cases which include: hypertensive encephalopathy (40%), unclassified (30%), acute renal insufficiency (20%), Ischemic heart disease (10%). The unclassified causes in this study were those deaths in which severe hypertension was the only recorded clinical findings as the cause of deaths. Deaths from hypertensive crisis other than stroke and heart failure were less common causes of

deaths probably because lesser demands for personnel and facility are required for the treatment. Low deaths from ischemic heart disease might have resulted from relatively low prevalence of coronary artery disease risk factors among south western Nigerians.<sup>23</sup> Underdiagnosis from lack of access to adequate diagnostic facility may also account for the low death frequency. Identified limitations of this study include generation of data from secondary sources and lack of post mortem backup. However, considering the level of personnel that generated the data, it was without doubt a useful data.

In conclusion, more females were admitted for CVD compared to males. Similarly, the crude mortality rate in females was higher than their male counterparts. Elderly had the highest CVD mortality. Stroke was responsible for over half of CVD mortality while hypertension was the commonest (over half) etiological factor of CVD deaths. Therefore, prevention and treatment of hypertension as well as provision of modern stroke care will significantly reduce cardiovascular deaths in this population of patients.

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