

# Cardiovascular Risk Profile Of Patients Seen At A Cardiac Clinic In Kumasi, Ghana.

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## Citation

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## Abstract

Prevalence of cardiovascular disease in Africa has increased in recent years. Studies suggest that cardiovascular disease will soon be the most important cause of morbidity and mortality in Africa. The objective of this study was to determine the prevalence of cardiovascular risk factors in patients presenting to the cardiac clinic of the Department of Medicine, Komfo Anokye Teaching Hospital (KATH), Kumasi, Ghana. Medical records of 432 patients were selected from the cardiac clinic, using simple random sampling. The demographic characteristics of the patients together with the prevalence of cardiovascular disease risk factors were examined. The patients were aged between 13 - 97 years with the mean age (+/-standard deviation) of 55.35 (+/-19) years. There were more females 229 (53 %) than males 203 (47 %). The main cardiovascular risk factors seen included: hypertension (48.4 %), overweight and obesity (46.3 %), dyslipidaemia (43 %), Electrocardiographic left ventricular hypertrophy (ECG LVH) (41.6 %) and diabetes mellitus (7.9 %).

Conclusion: Cardiovascular risk factors are highly prevalent in patients attending cardiac clinic at KATH, Kumasi, Ghana

## INTRODUCTION

Prevalence of cardiovascular disease in Africa has increased in recent years. Several decades ago, the burden of diseases among African populations was from infectious diseases. Cardiovascular disorders were then seen as rare among these populations but today, these nations are witnessing epidemiological transition<sup>1</sup> which has placed on them a double burden of disease<sup>2</sup>. This implies that while infections and infestations are still a major health burden in African countries<sup>3,4</sup>, non-communicable diseases have also become a problem. Recent studies suggest that non-communicable diseases will soon be the most important cause of morbidity and mortality in Africa<sup>2,4,7</sup>.

The rise in cardiovascular diseases is linked to the increase in hypertension, diabetes, obesity and dyslipidaemia observed in Africa in recent years<sup>8,9</sup>. Obesity and hypertension are now common throughout Africa, particularly in urban areas<sup>9</sup>. There are various measures of obesity, and the body mass index (BMI) is a very useful and common one. It is a mathematical formula that is highly correlated with the body fat<sup>10</sup>.

Hypertension is a common clinical condition affecting more than 600 million people worldwide and it is seen in nearly

all populations<sup>11</sup>. It occurs in the lower as much as in the higher socio-economic groups<sup>12</sup>. Hypertension is a powerful independent risk factor for death from cardiovascular disease<sup>11</sup>. Available studies provide important and worrisome findings in both epidemiology and clinical outcomes of hypertension<sup>13-16</sup>. Hypertension has been reported to account for up to 30 % of hospital admissions for heart failure in West Africa<sup>17</sup>, and the prognosis of hypertensive heart failure (HHF) among Black Africans has also been found to be poor.<sup>18</sup>

Even though, overall hypertension prevalence is between 10% - 15%,<sup>11,19</sup> prevalence rates as high as 30% - 32% have been reported in middle-income urban and some rural areas in Africa<sup>13-16</sup>. Hypertension awareness, treatment, and control rates as low as 20%, 10%, and 1%, respectively have also been found<sup>11,16</sup>. The prevalence of hypertension and the resulting morbidity are sufficiently high to justify viewing the condition as a serious health problem.

The number of people with diabetes in sub-Saharan Africa is expected to double between 2000-2030<sup>20</sup>. Prevalence trend of diabetes is on the rise as shown by recent data from African countries such as Benin (3%), Mauritania (6%), Cameroon (6.1%), Congo (7.1%), Zimbabwe (10.2%),

Democratic Republic of Congo (14.5%), Nigeria (2.2%)<sup>21-23</sup>.

The three major classes of lipoproteins found in the serum of a fasting individual include

high density lipoproteins (HDL) cholesterol, low density lipoproteins (LDL) cholesterol and very low density lipoproteins (VLDL) cholesterol. LDL cholesterol is the major atherogenic lipoprotein and has long been identified as the target of cholesterol-lowering therapy. HDL cholesterol levels are inversely correlated with the risk of cardiovascular disease. The VLDL is a triglyceride-rich lipoprotein, and they have been found to promote atherosclerosis, similar to LDL. The Framingham Heart Study<sup>24</sup>, found a direct relationship between levels of LDL cholesterol and the rate of new-onset coronary heart disease. Any LDL cholesterol above 100mg/dL (mmol/L) is known to be atherogenic<sup>24</sup>.

Left ventricular hypertrophy (LVH) is a major risk factor for cardiovascular disease. The Framingham heart study found out that ECG LVH was associated with a 15-fold increase in the incidence of heart failure<sup>25</sup>.

The objective of this study was to determine the prevalence of cardiovascular risk factors in patients presenting to the cardiac clinic of the Department of medicine, Komfo Anokye Teaching Hospital, Kumasi, Ghana.

## **METHODS**

This was a descriptive study carried out at the cardiac clinic of Komfo Anokye Teaching Hospital (KATH), Kumasi, Ghana. Ethical approval was obtained from the appropriate ethical committee.

Medical records of 432 patients were selected at cardiac clinic of the department of medicine, KATH, using simple random sampling. The demographic characteristics of the patients were examined. The prevalence of the following cardiovascular disease risk factors was also determined; hypertension, diabetes mellitus, dyslipidaemia, overweight or obesity, and electrocardiographic left ventricular hypertrophy (ECG LVH).

Hypertension was defined as the presence of a persistent elevated systolic blood pressure  $\geq 140$  mmHg and/or diastolic blood pressure  $\geq 90$  mmHg in patients aged 15 years and above<sup>26,27</sup>, and/or presence of hypertensive retinopathy and/or the use of antihypertensive drugs and/or past medical history of hypertension.

Diabetes mellitus was defined as a random blood glucose

level of 11.1 mmol/L or greater, and/or fasting blood glucose level of 7.0 mmol/L or greater<sup>28</sup>, and/or use of insulin or an oral hypoglycaemic agent.

Dyslipidaemia was defined as low levels of high density lipoproteins (HDL) cholesterol (men  $\leq 1.036$  mmol/L, women  $\leq 1.295$  mmol/L) and/or high levels of low density lipoproteins (LDL) cholesterol  $\geq 3.0$  mmol/L and/or hypertriglyceridaemia  $\geq 1.7$  mmol/L<sup>29</sup>.

Obesity/overweight was determined using the body mass index (BMI). The BMI was calculated as weight of patients in kilograms divided by the square of the height in metres<sup>10</sup>. Obesity and overweight were defined as a BMI  $\geq 30$  kg/m<sup>2</sup>, and a BMI  $\geq 25$  kg/m<sup>2</sup> but  $< 30$  kg/m<sup>2</sup> respectively.

Electrocardiographic left ventricular hypertrophy (ECG LVH) was diagnosed using Scott's criteria for LVH<sup>30</sup>;

Limb leads: R in I + S in III: more than 25 mm

R in aVL: more than 7.5 mm

Chest leads: S in V<sub>1</sub> or V<sub>2</sub> + R in V<sub>5</sub> or V<sub>6</sub>: more than 35 mm

R in V<sub>5</sub> or V<sub>6</sub>: more than 26 mm

R + S in any V lead: more than 45 mm

Statistical Analysis

Data from the patients' medical records were entered into a Microsoft Excel (2010) sheet. Data were cleaned and abnormal variable and wrong entry removed or changed. Data were then exported into SPSS 12.0 software for analysis. Descriptive analysis of baseline parameters was provided. Measure of central tendency using mean was calculated, and measure of spread using standard deviation and range were also calculated.

## **RESULTS**

Four hundred and thirty-two (432) patients were studied. There were 203 (47 %) males and 229 (53 %) females. The patients were aged between 13 - 97 years with the mean age (+/- standard deviation) of 55.35 (+/-19) years. Figure 1 shows the age distribution of the patients.

**Figure 1**

Histogram showing age distribution of patients.

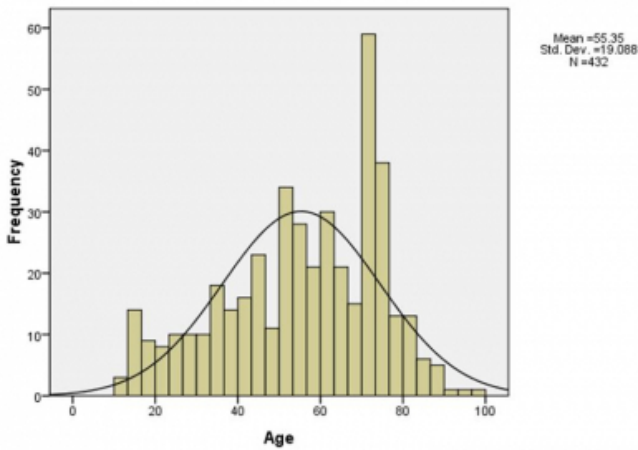
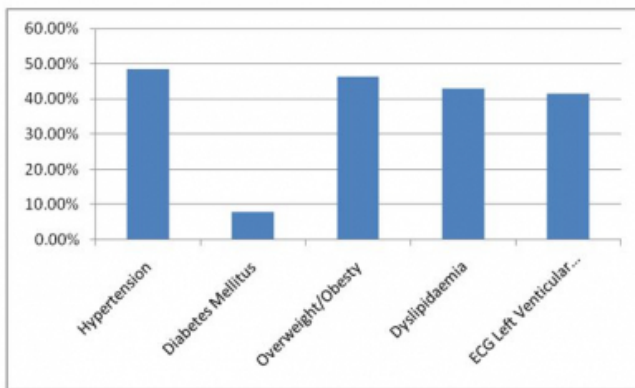


Figure 2 shows the prevalence of cardiovascular risk factors of the patients. The main cardiovascular risk factors seen included: hypertension (48.4 %), overweight/ obesity (46.3 %), dyslipidaemia (43 %), ECG LVH (41.6 %) and diabetes mellitus (7.9 %).

**Figure 2**

The Prevalence of Cardiovascular Risk Factors in the Patients



**DISCUSSION**

The findings of this study supports other studies which have shown that the prevalence of cardiovascular risk factors in Africa is high<sup>8, 9, 13, 14, 16, 31</sup>. Ogunleye et al found the prevalence of hypertension, diabetes, and dyslipidaemia among patients attending an outpatient clinic in Lagos, Nigeria to be 85%, 39.5% and 58.9% respectively<sup>31</sup>.

The high prevalence rate of hypertension in Africa justifies viewing hypertension as a serious health problem. However, the level of attention paid to hypertension in Africa has not matched its clinical significance. Hypertension is commonly seen as an affection of affluence occurring in middle and old

age; despite the fact that millions of people, especially the poor, die from the complications of hypertension in their forties and fifties. Hypertension is the main cause of heart failure in Africa<sup>7, 17 18, 32, 33</sup>. Studies have shown a continuous relationship between blood pressure and the risk of mortality from heart failure, ischaemic heart disease and stroke<sup>34- 37</sup>.

The prevalence of ECG LVH found in this study was lower than the prevalence of 66.5 % which was found among heart failure patients in Ghana<sup>7</sup>. ECG LVH is a major risk factor for cardiovascular disease. It has been shown to increase the risk of heart failure; the Framingham heart study found out that ECG LVH was associated with a 15-fold increase in the incidence of heart failure<sup>25</sup>.

The high prevalence of overweight and obesity as determined by the BMI in this study might be partly explained by the fact that most of the patients were heart failure patients who were likely to have fluid overload and increased weight. Another reason is that, in this study the prevalence of overweight and obesity were combined. Iloh et al found a lower prevalence rate of obesity (6%) among rural outpatients in Nigeria<sup>38</sup>. Higher prevalence rates of obesity have been found by other studies among urban populations<sup>9, 10</sup>. The urban-rural variation in the prevalence of obesity is attributed to the observation that the urban population is usually associated with modernization of lifestyle, which is largely characterized by a change in the dietary pattern and physical inactivity, when compared with the rural population.

Prevalence of diabetes mellitus was found to be the lowest (7.9%) among the patients in this study. An earlier study in Kumasi, Ghana<sup>7</sup> found prevalence of diabetes mellitus among patients presenting with heart failure to be 9 %. Studies in Port Harcourt and a Mission General Hospital in rural Nigeria reported prevalence of diabetes mellitus to be 6.8% and 3.9% respectively<sup>38, 39</sup>. Another study in Lagos, Nigeria found a higher prevalence of diabetes mellitus (39.5%) among outpatients<sup>31</sup>. These findings show that the prevalence of diabetes mellitus depends on the population group under study, with rural and urban variations.

The prevalence rate of dyslipidaemia seen in this study is similar to what has been shown by other studies in Africa<sup>8, 9, 31, 38, 39, 40</sup>. Dyslipidaemia is becoming an important medical problem in Africa<sup>46, 47</sup>. The Framingham Heart Study, found a direct relationship between the levels of LDL cholesterol (or total cholesterol) and the rate of new-onset coronary heart disease<sup>24</sup>.

Urbanization is a key feature in the rise of prevalence of cardiovascular risk factors<sup>9</sup>. Currently 40% of Africans live in urban areas, and it is estimated that by 2030 half of Africans will live in urban area<sup>40</sup>. This study has shown that cardiovascular risk factors are highly prevalent in patients

attending cardiac clinic at KATH, Kumasi, Ghana. More community-based studies are required to determine the actual prevalence of cardiovascular risk factors among Ghanaians.

## **References**

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