# MYOCARDIAL INFARCTION IN NIGERIANS: TRENDS FROM A TERTIARY INSTITUTION IN PORT HARCOURT, SOUTHERN NIGERIA.

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## ABSTRACT
**BACKGROUND:** *Nigeria is listed among countries undergoing demographic transition in health with non communicable diseases replacing infectious disease as a major cause of mortality. Socio-economic changes, rural to urban migration and unplanned urbanization have led to emergence of non-communicable diseases including ischemic heart disease (IHD) as major causes of disease. The actual prevalence of IHD in Nigeria is unknown but prevalence is generally considered low in Nigeria. This study was undertaken to describe the current prevalence as well as the spectrum of risk factors of myocardial infarction as seen at the University of Port Hracourt Teaching Hospital, Port Harcourt in Niger Delta region of Nigeria.*
**METHODS:** *A retrospective study of the prevalence and spectrum of presentation of myocardial infarction in the University of Port Harcourt Teaching Hospital, Port Harcourt over a three year period, July 2008 to June 2011. The medical records of patients admitted into the medical wards and intensive care unit of the hospital with a diagnosis of acute ischemic heart disease were reviewed and those that met the diagnostic criteria for acute myocardial infarction based on the WHO diagnostic criteria were analyzed. Data is presented in simple descriptive statistics.*
**RESULTS:** *A total of twenty nine (29) patients were diagnosed and admitted with ischemic heart disease over the study period while thirteen (13), 4 females and 9 males giving a ratio of 1:2.25 were confirmed as cases of acute myocardial infarction.*
**CONCLUSION:** *Myocardial infarction and ischemic heart disease appear to have increased in prevalence compared to earlier reports and the healthcare system is unprepared for the development. Community based programs should be initiated to control risk factors and measures introduced to cater for the morbidity associated with ischemic heart disease.*

**KEY WORDS:** *ischemic heart disease, myocardial infarction, prevalence, Nigeria.*

## INTRODUCTION

Ischemic heart disease and myocardial infarction remains one of the leading causes of morbidity and mortality amongst people in the developed countries despite advances in medicine[1].The use of re perfusion therapy, clot lysis or percutaneous coronary intervention, and chronic medical treatment with various pharmacological agents have substantially changed the therapeutic approach and outlook with reduction in-hospital mortality, and improvement in the long-term outlook for survivors of the acute phase. The greatest challenge to reduction in prevalence and incidence remains how to effectively implement preventive measures in all high-risk individuals as well as the delivery of acute treatment in a timely fashion to all affected patients. Myocardial infarction is still generally considered uncommon among Nigerians because earlier studies showed low prevalence and coronary atherosclerosis was rare[2-4]. The true incidence of ischemic heart disease and myocardial infarction in developing countries such as Nigeria has not been established due to lack of access to

health care by a large portion of the population, the lack of routine post mortem facilities for sudden or unexplained deaths and poor death registers[5]. Hospital based retrospective reports remains the only source of data on myocardial infarction in Nigeria while community based or autopsy based studies remains scanty. Recent reports show that prevalence of myocardial infarction among hospital admissions has increased in Nigeria and in Africa generally, over the last decade[6-8].

The major risk factors for coronary heart disease are hypertension, obesity, dyslipidemia, cigarette smoking, diabetes mellitus, left ventricular hypertrophy and physical inactivity. The prevalence and incidence of myocardial infarction varies greatly between geographical regions and ethnic groups. However, the prevalence of risk factors for acute myocardial infarction is similar irrespective of geographical region or ethnic origin[6]. However in the United States, African Americans have been shown to have higher coronary heart disease mortality rate and also of sudden death as initial manifestation of coronary heart disease[9-11,]. African Americans have also been found to have higher prevalence of multiple or clustering of coronary heart disease risks compared with whites [12,13]. Several studies among Africans also showed that the risk factors for ischemic heart disease and myocardial infarction are similar to findings in caucasians[14-15]. Recent reports[16] in the literature indicate changes in cardiovascular risk profile of Nigerians. Hospital and community based studies showed increasing prevalence of hypercholesterolemia and obesity among hypertensive patients, diabetics and even in the general population[16-18]. Among African Americans who have risk factors and dietary habits similar to their Caucasian counterparts, the prevalence of ischemic heart disease have been shown to be higher[19-21]. The prevalence of hypertension has also risen sharply and adherence to blood pressure control measures among Africans is one of the lowest in the world[22,23]. Thus as life style in urban centers of Nigeria changes to that of developed countries, the prevalence of risk factors in Nigerians would rise, and it is right to expect increase in prevalence of ischemic heart disease and myocardial infarction. This study was undertaken to assess the current situation in terms of prevalence and risk factors and challenges of management in a busy urban specialist hospital in Port Harcourt, Southern Nigeria.

## METHODS

A three year [July 2008 to June 2011] retrospective analysis of all the patients admitted into the medical and intensive care wards, with a provisional diagnosis of ischemic heart disease was undertaken. All the case notes of patients admitted with a provisional diagnosis of ischemic heart disease were retrieved and carefully analysed for demographic and clinical, laboratory and electrocardiographic evidence of myocardial infarction. Those with data that confirms acute myocardial infarction were analysed. The diagnosis of myocardial infarction was based on WHO diagnostic criteria namely: typical chest pain with any two of following:

   i.   elevated ST segment of >1mm in limb leads or 2mm in chest leads

ii.  myoglobin >110μg/L
iii. CPK MB>μ5g/l or Troponin T >0.5μg/l.

The data was analysed using excel for descriptive statistics. The result is expressed as means and standard deviation and tables as necessary.

## RESULTS

### Demographics of patients

A total of twenty nine(29) patients, nineteen (19) males and ten (10) females were admitted with a diagnosis of ischemic heart disease, thirteen (13) patients(44.8%), 9 males and 4 females (M:F 2.3:1) had electrocardiographic evidence of acute or recent myocardial infarction. The age range of subjects was 31 to 70years and mean age was 48.92± 11.1years. Table show the age distribution of subjects.
Three patients, one female and two males died, giving a mortality of 23%.

### Risk factors

The cardiovascular risk factors identified in the patients were hypertension in 6(46%), diabetes mellitus in 4(30.76%), elevated total cholesterol in 4(30.76%), low HDL cholesterol in 3 and hyperuricemia in 2 subjects. There was no history of tobacco use in any of the subjects and none of the patients had their body mass indices (BMI) measured. Three of the patients, two females and one male later underwent coronary angiography and all showed no evidence of coronary atherosclerosis.

### Clinical presentation and Outcome

Three (3) out of the thirteen patients died

giving a mortality of 23%. The major presenting symptoms were typical chest pain in 5 patients (38.46%), cough and dyspnoea in 3patients (23%), palpitation with sudden collapse in 3patients (23%), and severe epigastric pain unrelieved by conventional treatment in 2 patients (15%) (table 4). Based on the ECG pattern at presentation, six patients had anterior infarction, three had inferior infarction and four had ventricular tachycardia on ECG (Table 3)

**Table1. Age Distribution of Subjects**

| Age Range (Yrs) | Number | % |
|---|---|---|
| 30-39 | 2 | 15.38 |
| 40-49 | 6 | 46.16 |
| 50-59 | 3 | 23.08 |
| 60-69 | 2 | 15.38 |

**Table2. Cardiovascular Risks in Subjects**

| CV Risk | No |
|---|---|
| Hypertension | 6 |
| Diabetes | 4 |
| Raised TCH | 4 |
| Reduced HDL-C | 3 |
| Raised LDL-C | 4 |

**Table3. Infarct Location**

| | | |
|---|---|---|
| Anterior MI | 6 | 46.16% |
| Inferior MI | 3 | 23.08% |
| VT/UNINDICATED | 4 | 30.76% |
| TOTAL | 13 | |

**Table4. Pattern of Presentation**

| Symptoms | No | % |
|---|---|---|
| Typical Chest Pain | 5 | 38.46 |
| Epigastric Pain | 2 | 15.38 |
| Palpitation with Collapse | 3 | 23.08 |
| Cough and DOE | 3 | 23.08 |

## DISCUSSION

This study showed thirteen confirmed cases of acute myocardial infarction over a three year period and is similar to reports from some centers in Nigeria in the past two decades which has highlighted the increasing incidence of ischemic heart disease albeit in similar hospital settings[7,8]. The present review show that males are more affected than females and people in their prime age of 30 to 49years were most affected. This is also similar to findings in studies from other parts of the country[7,8] and has significant economic implication.

The pattern of presentation in this series show that more than half of the patients (61.54%) presented with atypical symptoms such as epigastric pain, palpitation with sudden collapse and cough associated with dyspnoea. This suggests difference in pattern of presentation in comparison to Caucasian, implying that a lot of cases may be missed or misdiagnosed and in the absence of post mortem will never be identified. The commonest site for infarction among the subjects was anterior myocardium (about 46%) followed by the inferior myocardium (about 23%) and the rest were not localizable due to the clinical presentation and is similar to the pattern reported from Maiduguri[22].

Hypertension, diabetes mellitus and dyslipidaemia are the major risk factors among the patients in this series and is similar to finding in patients seen in Zaria, Northern Nigeria. It also highlights the increasing importance of dyslipidemia as a risk factor for cardiovascular disease in Nigerians as reported by several authors[17,18].

The reports of increasing incidence of myocardial infarction from different parts of Nigeria may be due to increasing awareness or indeed a true reflection of an increase in prevalence of ischemic heart disease in Nigeria. Whatever the case, this and other studies point to the need to jettison the current complacency and work towards aggressive primordial and secondary preventive strategies. In 1990, Dagogo-Jack and Odia in their report of six cases of myocardial infarction in Port Harcourt Nigeria over a one year period drew attention to the need for practitioners in Nigeria to develop a high index of suspicion for ischemic heart disease especially in patients with risk factors. Since their report, other authors[7,8] have drawn attention to the apparent increase in the incidence of ischemic heart disease in Nigerians.

It is therefore incumbent on medical practitioners in Nigeria especially physicians to actively and urgently develop capacity in clinical, laboratory and therapeutic skills to effectively manage the emerging threat of ischemic heart disease. In Nigeria and other sub-Saharan Africa, there is paucity of resources especially poor access to effective drugs and medicaments and also a current lack of high technology capacity in the management of ischemic heart disease especially acute coronary syndromes.

The Nigerian Health authorities should therefore actively promote healthy life style changes such as increase physical activity to reduce obesity rates, smoking cessation, programmes for effective control of hypertension and type 2 diabetes mellitus in order to reduce the incidence of cardiovascular diseases including ischemic heart disease.

Cardiovascular health would need to be promoted early in life in order to avoid the development of childhood obesity. The Geoffrey Rose prevention strategy[23] of a continuation of population or mass approach and high risk individual approach should be implemented

**CONCLUSION:** Myocardial infarction prevalence is still low among Nigerians but its associated risk factors is increasing among Nigerians and this may change the trend in the future.

**LIMITATION OF STUDY:** The limitation of this review is the lack of cardiac enzyme assay in the region and so diagnosis was based on clinical criteria and ECG findings as in the WHO criteria. Also patients who presented in ventricular fibrillation/fibrillation could not be adequately evaluated in the emergency room before their demise resulting in loss of some data. This review highlights the challenge of diagnosis of acute myocardial infarction in a resource poor setting in Southern Nigeria.

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