



Journal of Medical Sciences

ISSN 1682-4474

science
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JMS (ISSN 1682-4474) is an International, peer-reviewed scientific journal that publishes original articles in experimental & clinical medicine and related disciplines such as molecular biology, biochemistry, genetics, biophysics, bio-and medical technology. JMS is issued four times per year on paper and in electronic format.

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J. Med. Sci., 5 (4): 358-362
October-December, 2005

Myocardial Infarction at the University of Maiduguri Teaching Hospital, Northeastern Nigeria: A Long-term Review

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Within a 22-year period, 1983-2004, 87 cases of Acute Myocardial Infarction (AMI) were seen at the University of Maiduguri Hospital, in Northeastern Nigeria. This mainly retrospective study revealed that during this same period, the new admissions to the Medical wards of the Hospital (those presenting to the hospital for the first time) totaled 25,588 patients. Myocardial infarction thus formed 0.34% of all new admissions over the period under review. The age-range of the affected patients fell between 38 and 67 years, with the 41-50 year age group mostly affected. Mortality was 39% among the cases seen. Male to Female ratio was 7.5:1. Forty-one percent of the affected patients were both hypertensive and diabetic, while 55% had hypertension alone. The commonest complications were congestive cardiac failure due to severe pump failure, arrhythmias, mitral regurgitation and pericardial effusion. The commonest site of the infarction was the anterior myocardium. About 36% of the total number of cases presented in the last 4 years of the study period. The presence of myocardial infarction in the far Northeastern Nigeria is established and the incidence of this disease, though lower than that of other parts of Nigeria, is rising.

Key words: Myocardial infarction, Maiduguri Teaching Hospital, review

INTRODUCTION

Acute Myocardial Infarction (AMI) is much more common in the Western industrialized countries, than in the less developed countries of the third world. In the United States, the 1.1 million cases of AMI seen annually are responsible for nearly 400,000 deaths^[1]. Even in these countries, the incidence of AMI appears to be on the increase with substantial variations from area to area. It varies with sex and social class and it is about three to four times more common, in men than women^[2]. The 30% mortality recorded in these countries is lower than the 40-50% recorded about a decade ago, although this last figure is close to what presently obtains in less developed countries^[3]. Most patients with AMI succumb within 20 days of onset of the disease. Elderly patients fare less well and even in affluent societies, about half of the patients still succumb before reaching medical care^[4]. About one in twenty-five patients die within the first year after AMI^[5].

On recognizing the increasing prominence of coronary heart disease, an expert committee on non-communicable disease set up by the federal Ministry of Health Nigeria in 1988, undertook a nationwide survey and from initial reports published in 1992^[5], it was expected that ischaemic heart disease would become a major issue by the year 2000^[5]. This prediction did not come to pass, probably because of the overwhelming nature of the Acquired Immune Deficiency Syndrome (AIDS) epidemic that gave infectious diseases a resurgence among the obstacles to health, in our developing economy. Nevertheless, the incidence of AMI is on the increase in developing countries such as Nigeria, because of rapid urbanization with its tendency to a sedentary life style and western-type dietary habits, obesity and the continuing scourge of Hypertension and Diabetes mellitus related hypercholesterolemia^[6]. Epidemiological data from the United Kingdom Prospective Diabetes Study (UKPDS)^[7] have confirmed the importance of dyslipidaemia, hypertension, hyperglycaemia and cigarette smoking as risk factors for the development of coronary heart disease and myocardial infarction.

A 10-year report (1961-1970) in western Nigeria stated only 26 patients with AMI^[8], while an African multi-centre study in 1991 reported an incidence of 3.17% out of a total of 3,243 hospitalized patients^[9]. Reports from various centers in the middle belt and Southern Nigeria suggest that AMI is definitely on the increase in the country^[6]. No such study has been carried out in the far North-eastern part of the country, on the fringes of the Sahara desert, hence the necessity of documenting the findings in this study.

MATERIALS AND METHODS

A retrospective study of patients newly diagnosed as having acute myocardial infarction over a period of twenty-two years (1983- 2004) was carried out at the University of Maiduguri Teaching Hospital (UMTH). Diagnosis was based on standard clinical and laboratory parameters, namely: Retro-sternal chest pain unrelieved by nitrates, electrocardiographic features such as; elevated ST segment, pathologic Q-waves, echocardiographic features of wall motion abnormalities, sudden onset of mitral regurgitation, or ventricular septal defect and biochemical results indicative of raised cardiac enzymes such as creatine phosphokinase, lactate dehydrogenase and aspartate transaminase. The clinical records of the patients were also useful for assessing relevant information, such as patient's age, sex, presenting complaints, clinical diagnosis and electrocardiographic/echocardiographic reports. Predisposing factors such as smoking, systemic hypertension, hypercholesterolemia, coagulopathies etc and complications developed by each particular patient was noted where such records were available.

Limitations of study: In many instances during the course of this study, the complete details of reports necessary to categorize patients as desired, could not be obtained from the case records of these patients. In a number of cases, the actual copies of the investigation results such as ECG tracings, echocardiograms and other laboratory results were not available, even though written notes in the case-folders usually summarized the findings. These were probably misplaced in the process of manual mass documentation and indexing, as practiced in many Hospitals in Nigeria in the last century, though, Hospital records are now being computerized, nationwide.

RESULTS

The University of Maiduguri Teaching Hospital was commissioned by the then President of the Federal Republic of Nigeria, Alhaji Shehu Shagari, in 1983. This study looks at all the cases of acute myocardial infarction seen in the first twenty-two years of the operational existence of the Hospital. Eighty-seven patients were diagnosed as having AMI over the period under review. Of this number, 34 patients died, giving a mortality of 39% (Fig. 1).

The male: female ratio was 8:1, with only ten of the patients being females. The age of affected patients varied from 18-67 years. The 41-50 year group had the highest number of patients (36) out of which only two was a female (Fig. 2). A total of 30 patients fell into the

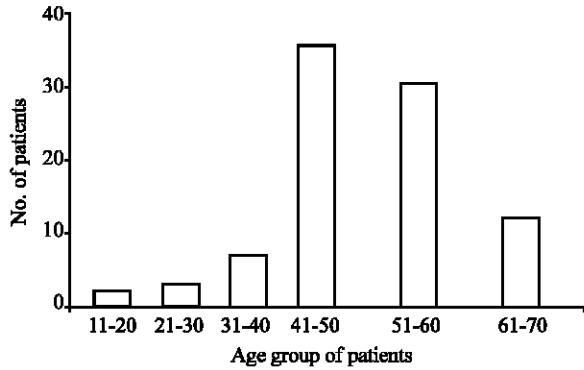


Fig. 1: Age distribution of AMI patients

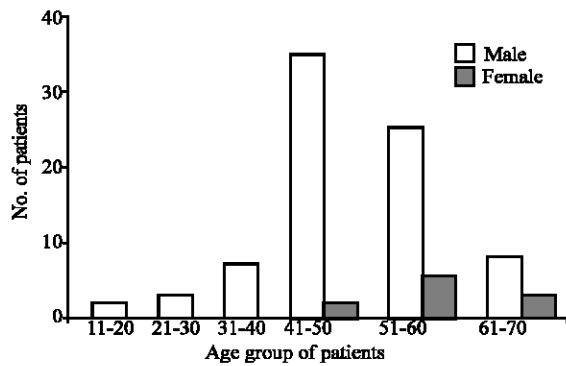


Fig. 2: Male: Female distribution of AMI patient

51-60 year age group and of this, 5 were females. The 61-70 year age group had 10 patients, of which 3 were females (Fig. 2). The least affected group was the 11-20 year age-group, which had only two patients, an eighteen year old male who also presented with left hemi paresis and sudden blindness in both eyes and a patient with Nephrotic syndrome. The patient was being managed for sickle cell disease and started attending the hospital from the age of 10. There were 3 patients in the 21-30 age group with AMI. One had nephrotic syndrome, while the other two had rheumatic mitral and aortic valvular heart disease. These relatively young patients succumbed to the disease. The 41-50 age group had the largest number of males while most of the females belong to the 51-60 age group. Fifty-three percent of the patients had hypertension while 39% of them smoked cigarettes. Hypercholesterolemia was present in 29% of the patients while 20% were obese (Table 1). Most of the patients with hypercholesterolemia had diabetes mellitus and hypertension. One patient who had nephrotic syndrome. Table 2 shows the various sites affected by AMI with the number of patients in each category. More than half of the patients (55%) had anterior myocardial infarction, while 27% of the patients had inferior myocardial infarction. The

Table 1: Percentage of predisposing factors in patients with AMI

Predisposing factors	Incidence (%)
Hypertension	53
Diabetes mellitus	41
Smoking	39
Hypercholesterolemia (most had diabetes mellitus and hypertension)	29
Obesity	20

Table 2: Percentage of infarction sites

Sites	Incidence (%)
Anterior	55
Inferior	27
Posterior	4
Others	14

Table 3: Percentage of complications of AMI at UMTH

Complication	Incidence (%)
Congestive cardiac failure	39
Arrhythmias	39
LVSF/Cardiogenic shock	35
Pericardial effusion	20
Mitral regurgitation	16
Ventricular septal defect	7

LVSF: Severely Reduced Left Ventricular Systolic Function

posterior myocardium was affected in only 4% of the cases. Table 3 shows that 39% of the patients had congestive cardiac failure, 39% also had various forms of arrhythmias, while 29% of the cases were complicated by cardiogenic shock. Twenty percent of the patients had pericardial effusion while mitral regurgitation was seen in 10% of the patients.

DISCUSSION

Between 1983 and 2004, at the University of Maiduguri Teaching Hospital, a period of 22 years, eight-seven cases of acute myocardial infarction were seen, out of 25,588 new patients that were admitted to the medical wards over the same period. Considering all hospital admissions, to all the clinical departments at UMTH, Maiduguri over the same period, the incidence of AMI is about 1:18,500. This is lower than what was reported by Falase nearly three decades ago^[8], but higher than what was reported by Oke and Talabi^[10] about five years ago. Both Lagos and Ibadan, in the Southwestern part of the country, belong to the same geographical belt and are relatively more urban than Maiduguri, which is on the fringes of the Sahara desert. The bed capacity and patient turn-over are much higher at the teaching hospitals in both Lagos and Ibadan, presently the largest and second largest cities in Nigeria and West Africa, respectively. The higher incidence in this study than that of the Lagos study, may be as a result of the fact that contrary to what obtains in Maiduguri, Lagos has many other hospitals which have good enough facilities, to take care of AMI patients. The patients in this study

constituted 0.34% of hospitalized patients, which is lower than that obtained in previous studies^[9,11]. This can be explained by the fact that health care delivery, is much more advanced in these other areas, than what obtains in Maiduguri, so patients are therefore more likely to report to the hospital on time. It should be mentioned here that excluded from these series are several cases of sudden death either shortly before arrival at hospital or shortly after. Many of such cases though possibly due to AMI, could not be confirmed because in most cases, cultural and religious practices which among other things, required immediate burial, did not permit a post-mortem examination. Odia^[6] also noted that reports from several centres suggest that the incidence of AMI is rising. This is reflected in our study, which showed that 36% of cases seen over the last 22 years, presented within the last 4 years of this study, although this could also be a reflection of awareness of the advantages of health care delivery in the last few years. The 39% mortality seen in this series is not surprising because current figures from the United States puts the mortality in AMI at 30%, in spite of a much better health care delivery system. The figure in this study is also higher than the 33% reported in Lagos, south-western Nigeria, probably because of better accessibility to specialist health care. Males are generally more affected than females throughout the World, but the male: female ratio of 7.5:1 seen in this study is quite high and may be related to the cultural practices in this part of Nigeria, where in comparison to the men, the women are hardly out-going. Two patients in this study had rheumatic mixed mitral valve disease/endocarditis with possible embolic phenomenon resulting in AMI.

These patient together with others who had endocarditis and nephrotic syndrome were the youngest in this series, where the age range of affected patients was 18-67 years. Most of the females in this study were within the 51-60 age group (a decade higher than the peak age group of the males). This is expected because at the perimenopausal and postmenopausal age range, their physiology becomes closer to that of males, in many respects. Endomyocardial fibrosis did not feature prominently as a factor in this group of patients contrary to what was observed by Williams^[12], several years ago. The most common predisposing factor in this study was hypertension. This concurs with the findings of Oke and Talabi^[10], though the percentage of hypertension in the present study is higher. Echocardiography (which has been available at the UMTH since 1995) and electrocardiography combined with clinical assessment were used to determine complications of AMI in these patients. The most common complications were congestive cardiac failure, arrhythmias and severely reduced Left Ventricular Systolic Function (LVSF)

resulting in cardiogenic shock. The least common complication was ventricular septal defect^[13]. The fact that the much needed special emergency care for these patients were rarely available, definitely had an additional role to play in the reduced survival of these patients^[14,15], compared with their counterparts in the western world. About 60% of the mortality consisted of patients who had anterior AMI. This agrees with previous studies that anterior myocardial infarction has a relatively higher mortality than AMI involving other sites.

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