



PREVALENCE OF ABDOMINAL OBESITY IN AN ASIAN POPULATION WITH ISCHEMIC HEART DISEASE

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ABSTRACT

BACKGROUND AND OBJECTIVE: Changes in lifestyle have resulted in increased prevalence of Abdominal Obesity in the developing countries with consequent health risks. The objective of this study was to determine the prevalence of abdominal obesity in patients presenting with acute myocardial infarction in Pakistani population.

METHODS: The study was conducted at Punjab Institute of Cardiology, Lahore, Pakistan over a period of 6 months. Patients aged 35 to 75 years, admitted with acute myocardial infarction were studied. Waist circumference of each patient was measured, and mean waist circumference was calculated for both genders. The percentage of men and women fulfilling the criteria for abdominal obesity was calculated using Asian as well as International cutoff values of waist circumference.

RESULTS: Among a total of 321 patients, 232 (72.3%) were males and 89 (27.7 %) were females. Mean age was 60.3 (± 6.4) years. ST-elevation MI was found in 237 (73.8%) and Non ST-elevation MI in 84 (26.2%). Overall frequency of abdominal obesity was 50.2% in patients with acute MI. Among males 109 (47%) and among females 52 (58.4%) had abdominal obesity. Mean waist circumference was 94.1 (± 11.3) cm among men and 86.6 (± 10.2) cm among women.

CONCLUSION: About half of the Pakistani patients suffering from acute myocardial infarction have Abdominal Obesity.

KEY WORDS: Abdominal Obesity, Myocardial Infarction, Body Mass Index

INTRODUCTION:

Obesity is one of the oldest known human ailments and morbidity and mortality associated with it have been known to medical profession for more than 2000 years¹. The term 'over weight' refers to the body weight above normal range, while 'obesity' refers to significant overweight posing substantial health risks to the patient [2,3]. More recently it has been well established that it is not just the body weight but the total content and distribution of fat in the abdominal area which more appropriately defines various health risks for these individuals^{2,3}. In other words, visceral fat accumulation is more dangerous than subcutaneous fat.

Magnetic resonance imaging (MRI) is the most effective tool to quantify amount of abdominal fat. But due to its cost and cumbersome nature of the test, it cannot be applied widely for this purpose⁴. Alternatively, measuring the waist circumference

(J Cardiovasc Dis 2013;11(2):33-36)

(WC) is a very simple way to diagnose abdominal obesity and predict cardiovascular (CV) events consequent upon it.⁵ Abdominal obesity (AO) is a more accurate predictor of cardio-metabolic risk than generalized obesity measured by body mass index (BMI)⁶.

The prevalence of obesity is rising at a rapid pace in the developing countries due mainly to changing lifestyles⁷⁻⁹. Sedentary lifestyle along with amount and type of consumed food play an important role in the pathogenesis of obesity.¹⁰

Obese individuals are at increased health risks in terms of morbidity and mortality.⁷ They are more likely to have coronary artery disease (CAD), cerebrovascular disease, diabetes mellitus, sleep apnea and neoplastic diseases and, hence, have a reduced life expectancy.¹¹ The cardiac manifestations of obesity include increased risk for CAD, first myocardial infarction at an early age,¹² increased incidence of heart failure,¹³ atrial fibrillation,¹⁴ and deep vein thrombosis.¹⁵ Obesity is also associated with some non cardiac health problems, with significant morbidity, like osteoarthritis, cholelithiasis and impaired quality of life. All of these patients in addition to weight loss require aggressive risk

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factor modification. We conducted this study to determine the prevalence of abdominal obesity in patients presenting with acute MI.

MATERIAL AND METHODS:

This hospital based, cross sectional study was conducted in the department of cardiology, Punjab Institute of Cardiology, Lahore, Pakistan over a period of 06 months (2010-11). All patients aged 35 to 75 years and suffering from acute myocardial infarction were studied. Informed consent was obtained from each patient. Each patient underwent a complete physical examination, serial ECGs and cardiac bio-markers (CPK, CKMB) every six hours. Waist circumference (WC) of each patient was measured in standing position midway between lower border of rib cage and iliac crest¹⁶ using a flexible measuring tape. AO was defined as follows:¹⁷

- WC > 102 cm (~40 inches) for men and > 88 cm (~35 inches) for women [Adult Treatment Panel (ATP)-III international criteria].
- WC > 90 cm (~35 inches) for men and > 80 cm (~31.5 inches) for women [Asian criteria].

Patients were labeled as having AO using Asian cut off limits. Data was analyzed using SPSS-15. Mean WC for men and women was calculated. The numbers of patients across various ranges of WC were expressed in percentages. The percentage of men and women fulfilling the criteria for AO was mentioned both for International and Asian cutoff values of waist circumference.

RESULTS:

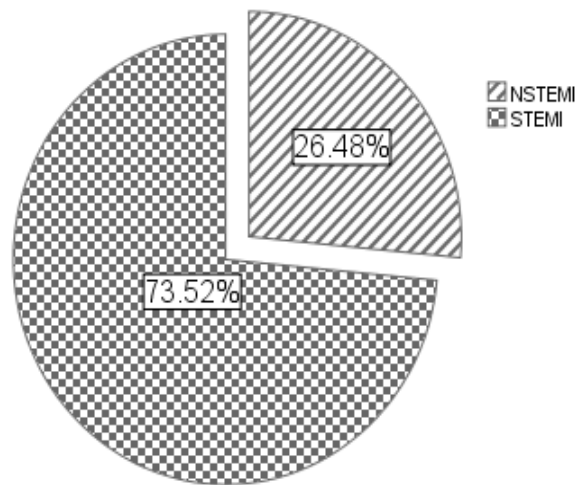
A total of 321 patients with acute MI were studied. Mean age of the patients was 60.3 ± 6.45 years, range 35-75 years. There were 232(72.3%) males and 89 (27.7%) females having similar mean ages. ST-elevation MI was more frequent [237 (73.8%)] in this study population than NSTEMI [84 (26.2%)], Figure 1. Number of patients in various ranges of abdominal circumference among men and women is shown in Figure 2. Using Asian definition (i.e. WC > 90cm for males and WC > 80 cm for females), 161 (50.2%) patients fulfilled the criteria for abdominal obesity. By Asian criteria, abdominal obesity was more frequent among women i.e. 58.4% as compared to men (47%). According to international ATP III criteria (i.e. WC greater than 102 cm for men and 88 cm for women), 123 (38.3%) patients had abdominal obesity, Table 1. No significant association between age of the patients and presence of abdominal obesity was demonstrable (p-value=0.51).

DISCUSSION:

Table 1: Baseline and Outcome Characteristics of Patients.

Characteristic	Male n=232	Female n=89	P value
Age- mean ±SD	60.7(± 6.5)	60.8(± 6.3)	0.68
Waist circumference (cm) - mean ±SD	94.1 ±11.2	86.6 ±10.2	0.48
Abdominal obesity by Asian criteria- n (%)	109 (47%)	52 (58.4%)	0.087
Abdominal obesity by International criteria- n (%)	92 (39.7 %)	31 (34.8%)	0.502

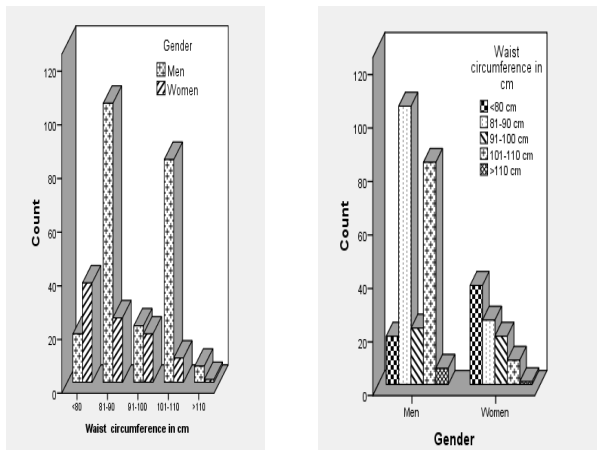
Figure 1: Types of myocardial infarction in study population



Abdominal obesity is an important clinical entity which should be assessed in all patients presenting with a manifestation of ischemic heart disease. There are several methods to assess and quantify AO. The methods used to directly measure body fat (e.g. CT, MRI) are not applicable in daily practice⁴. On the bedside, obesity is often assessed and quantified by means of indirect estimates of body fat i.e. anthropometrics. Ethnic variability does exist because Asians have more total fat and visceral fat and are therefore at higher risk for developing type 2 diabetes mellitus and CV complications for a given WC than whites.¹⁷⁻¹⁹ The WC measurement remains a reliable tool to assess and grade obesity clinically²⁰. Increased waist circumference can be a marker for increased risk even in persons who are not obese on the basis of BMI. [6] AO is rising at a tremendous rate in developing nations, consequent with its attendant health risks²¹ and high costs of management.²²

We observed quite a high proportion of AO (50%) in an Asian patient population presenting with acute MI. A recent study on metabolic syn-

Figure 2: Number of patients in various ranges of abdominal circumference among men and women.



drome and ischemic heart disease (IHD), similarly showed high frequency of AO (64%) among patients presenting with acute MI²³. A large international study by Beverley Balkau et al²⁴ enrolled patients from 63 countries, 19381 patients from south Asian countries (including Pakistan) and reported a mean WC of 89.3 ± 13.4 cm among men and 84.1 ± 13.9 cm among women; corresponding values from our study are 94.1 ± 11.2 cm and 86.6 ± 10.2 cm.

A multicentre study conducted in USA and UK on prevalence of abdominal obesity and awareness among primary care physicians and patients about its attendant cardio-metabolic risks yielded surprising results. It revealed that 39% of all patients visiting a primary care physician were obese; in North

America this proportion was 49%. Abdominal obesity was recognized by 58% of physicians as a significant risk factor for IHD. About 45% of the physicians reported never measuring WC. Among the patients who were obese and at risk for IHD, only 41% had been informed by their physician about the link between abdominal obesity and heart disease⁶. These figures highlight the lack of awareness and need to educate the primary care physicians as well as the general population about the health risks of obesity.

AO is associated with significant morbidity and mortality.²⁵ It increases risk of developing CAD, heart failure, cerebro-vascular disease and diabetes. There is both an impaired quality of life in addition to an early mortality in the afflicted individuals. The Framingham Study showed those who were obese at 40 years of age, lived seven years less than those who were not.¹² Keeping this in view, the American Academy of Family Physicians recommends that physicians should assess all adult patients for overweight and obesity during routine medical examinations,²⁶ and this should follow counseling and planning for its management.

This was a hospital based study and larger population based studies are needed to exactly estimate the prevalence of abdominal obesity and to design the health plans for primary prevention.

We conclude a high prevalence of AO in a South Asian patient population presenting with acute MI. The patients at risk (like diabetics) and those already afflicted with manifestations of CAD should receive special attention in terms of management and preventive measures.

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