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Research Article

**FREQUENCY OF INCREASED WAIST TO HIP RATIO IN
PATIENTS OF ACUTE MYOCARDIAL INFARCTION**Dr Arooj¹, Dr Asma Batool², Dr Ifrah Sarosh Arooj³¹BHU, Thata Muhammad Shah Tehsil Bhowana District Chiniot²Nishtar Medical College Multan³Nishtar Hospital Multan

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Abstract:

Introduction: Worldwide, incidence of Acute Myocardial Infarction (AMI) has been increasing over the years and now reflected as the leading cause of death universally. Overweight and obesity have been recognized as a major risk factor for coronary heart disease (CHD) with increasing prevalence. **Aims and objectives:** The main objective of the study is to analyze the frequency of increased waist to hip ratio in patients of acute myocardial infarction in Pakistan. **Material and methods:** This cross sectional study was conducted in Nishtar Hospital, Multan during November 2019 to July 2020. The data was collected from 100 patients of both genders. The age range was 25 to 60 years. Patients taking lipid lowering drugs and patients of chronic renal failure or chronic liver disease were excluded from the study. Waist was measured at narrowest part below rib cage and hip was measured at widest part of buttocks. Waist and hip of every patient was measured and waist hip ratio was calculated from those readings. The demographic values of all the patients were collected for further analysis. The patients' waist and hip circumferences were measured in centimeters. Then a ratio of waist to hip was calculated from these two measurements for each patient. **Results:** The data was collected from 100 patients of both genders. The mean age was 45.5 ± 4.65 years. This study demonstrated that most of the patients were male. Regarding distribution of normal and abnormal waist to hip ratio in patients presenting with acute myocardial infarction. It was noted that 77.9% patients had normal waist to hip ratio while remaining 22.1% patients had abnormal waist to hip ratio. The study population was also evaluated for other risk factors. Smoking was found to be the commonest risk factor as 65.78% patients were smokers. **Conclusion:** It is concluded that WHR can be deemed an excellent predictor of MI risk, as there is a significantly increased risk of MI among patients with a high WHR. The predictive effect of WHR on the risk of MI is even more significant in men than in women.

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INTRODUCTION:

Worldwide, incidence of Acute Myocardial Infarction (AMI) has been increasing over the years and now reflected as the leading cause of death universally. Overweight and obesity have been recognized as a major risk factor for coronary heart disease (CHD) with increasing prevalence. Experts have predicted that the current growth rate of obesity (an estimated 7% increase in men and 10% increase in women by 2020) will lead to an increase in the number of CHD events by 14% in 2035¹. Among the various types of CHD, myocardial infarction (MI) is associated with a high incidence rate, acute onset, and increased lethality, thereby posing a serious threat to the life of the patient.

Body mass index (BMI) can serve as a marker indicating the general obesity, and the relationship between MI and BMI has been intensively investigated, but there are still certain limitations requiring our concern². In relation with BMI, there seem to be closer correlations of the anthropometric measures of abdominal obesity (such as the waist circumference [WC], waist-to-height ratio [WHtR], waist-hip ratio (WHR), and the sagittal abdominal diameter) with the metabolic risk factors, MI events, and death events³. Moreover, excessive fat mass in the body, rather than excessive body weight, accounts for the leading cause of the increased risk of MI among the obese population⁴. Consequently, some studies indicate that central obesity index, WC, WHtR, and WHR are the risk factors for predicting MI, which can also overcome the limitations of BMI⁵.

Waist-to-hip ratio is a novel, simple independent predictor of vascular endothelial dysfunction (ED). ED can be the first clinical presentation of subclinical atherosclerosis. WHR has been also linked to CAD independently of BMI and other traditional risk factors even in normal-weight or lean population⁶. WHR may be particularly important risk factors than other anthropometric measures for atherosclerosis. The non-invasive devices to measure WHR in particular is becoming increasingly common in clinical practice⁷.

Objectives

The main objective of the study is to analyze the frequency of increased waist to hip ratio in patients of acute myocardial infarction in Pakistan.

MATERIAL AND METHODS:

This cross sectional study was conducted in Nishtar Hospital, Multan during November 2019 to July 2020. The data was collected from 100 patients of both genders. The age range was 25 to 60 years. Patients taking lipid lowering drugs and patients of chronic renal failure or chronic liver disease were excluded from the study.

Waist to hip ratio

Waist was measured at narrowest part below rib cage and hip was measured at widest part of buttocks. Waist and hip of every patient was measured and waist hip ratio was calculated from those readings. The demographic values of all the patients were collected for further analysis. The patients' waist and hip circumferences were measured in centimeters. Then a ratio of waist to hip was calculated from these two measurements for each patient. Waist hip ratio was measured for estimation of fat distribution and >1 was considered abnormal.

Statistical analysis (Anova Test and Post Hoc) was performed using the SPSS software program (17.0). All results were expressed as the mean \pm standard deviation (SD). As P value <0.05 was considered to be statistically significant.

RESULTS:

The data was collected from 100 patients of both genders. The mean age was 45.5 \pm 4.65 years. This study demonstrated that most of the patients were male. Regarding distribution of normal and abnormal waist to hip ratio in patients presenting with acute myocardial infarction. It was noted that 77.9% patients had normal waist to hip ratio while remaining 22.1% patients had abnormal waist to hip ratio. The study population was also evaluated for other risk factors. Smoking was found to be the commonest risk factor as 65.78% patients were smokers.

Table 01: Demographic characteristics of patients

Variables	% age
Age	45.5 \pm 4.65
Male	75
Female	25
Smoking	65.78
Hypertension	34.9
Metabolic syndrome	45.98
History of heart diseases	18.9

There were 34.9% of the patients who had history of hypertension. Other risk factors like metabolic syndrome was seen in 45.98% of the patients, history of ischemic heart disease in 36.3% of the patients and family history of ischemic heart disease in 18.9% of the patients.

Table 02: Waist to hip ratio of selected patients

Waist to Hip ratio	Age (Years)	Gender	
		Male (%)	Female (%)
Normal	25-35	15.9	3.1
	35-45	45.89	46.98
	45-60	40.91	51.24
Abnormal	25-35	37.13	20.65
	35-45	33.45	21.98
	45-60	29.19	21.76

DISCUSSION:

Central obesity, which refers to a high WHR, likely contributes to MI via multiple pathways involving oxidative stress and inflammation, steroid hormones, free fatty acids, and altered production and function of adipocyte-derived hormones⁷. Recent cardiac metabolism imaging studies conducted in large cohort studies have shown that visceral fat hyperplasia can exceed its storage capacity and become oversaturated, leading to a spillover of lipids that are then stored in normally lean tissues such as the heart, liver, and intrathoracic fat, contributing significantly to cardiac and metabolic abnormalities⁸. In addition, adipose tissue fat cells are involved in the promotion of atherosclerotic regulation processes, and excessive visceral fat is associated with insulin resistance, hypertriglyceridemia, highly atherogenic small LDL particles, and low HDL levels, all proatherogenic factors⁹. Subsequently, endothelial vasomotor dysfunction, a hypercoagulable state, and dyslipidemia are triggered, eventually leading to MI¹⁰.

In light of these results, first, the ability of WHR to predict MI risk is evident, and healthcare professionals should consider the pivotal role of WHR in identifying populations at higher risk of MI, especially in women. Second, further work is needed to discern the best practice guidelines for capturing the various dimensions of WHR that contribute to MI risk¹¹.

CONCLUSION:

It is concluded that WHR can be deemed an excellent predictor of MI risk, as there is a significantly increased risk of MI among patients with a high WHR. The predictive effect of WHR on the risk of MI is even more significant in men than in women. Thus, the measurement of WHR may have clinical utility in MI risk assessments, particularly for those patients with elevated WHRs.

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