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FREQUENCY OF RAISED BODY MASS INDEX (BMI) IN PATIENTS PRESENTING WITH MYOCARDIAL INFARCTION

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ABSTRACT

Introduction: Myocardial infarction is a dreadful cardiac complication and can be fatal. Raised BMI is thought to be the one of reversible factor and its control can decrease the morbidity and mortality. **Objectives:** To determine the frequency of raised BMI in patients presenting with myocardial infarction. **Material and methods.** This was a cross sectional study that was conducted at Department of Cardiology, Sheikh Zayed Hospital, Rahim Yar Khan during May 2016 to February 2017 in which 100 cases of acute myocardial infarction (Diagnosed with ECG changes with raised Troponin T levels) were included. Socio demographic data like age, gender, BMI and relevant clinical data i.e. DM, HTN and type of MI (STEMI or NSTEMI) were taken. Raised BMI was labelled when it was more than 25 kg/m^2. **Results;** In this study there were total 100 cases out of which 60 (60%) were males and 40 (40%) females with mean age of 53.14±5.76 years. There were 32 (32%) cases with DM and 40 (40%) with HTN while 72 (72%) had ST elevation MI. Raised BMI was seen in 40 (40%) of cases. This was significantly high in females where it affected 24 (60%) of cases as compared to 16 (26.67%) females with p= 0.01. Raised BMI was common with DM but had equal distribution in cases with or without HTN. There was almost equal distribution of raised BMI in cases of both STEMI and NSTEMI with p= 0.98. **Conclusion;** Raised BMI is an independent risk factor in cases of acute coronary syndrome. It is significantly high in number in female patients.

Key words: MI, Raised BMI, DM, HTN

INTRODUCTION

Every year, over 6 million patients present to the emergency department with chest pain, and the majority are subsequently admitted with concern for Myocardial infarction (MI). MI is diagnosed either immediately with specific ECG changes or needs confirmation with the help of various cardiac enzymes like Troponin T, Troponin I, Creatinine Kinase –MB (CK-MB). Based on ECG changes and cardiac enzymes, it can be subdivided into two groups, which include ST segment elevation MI (STEMI) and Non ST segment elevation MI (NSTEMI).[1]

MI can lead to different complications including cardiogenic shock, arrhythmias, progressive heart failure, mechanical cardiac complications and repeat MI.[2, 3] A similar trend was noted in an analysis of data on 2.5 million patients from the National Registry of Myocardial Infarction (NRMI).[4]

Well documented risk factors associated with high risk of MI include DM, HTN, Family history, Smoking, raised BMI.5, 6. Controlling reversible factors like smoking, HTN, DM and obesity decreased morbidity and mortality in such cases. [7, 8]

BMI, associated with more chances of DM, high insulin resistance, increase oxygen demand and dyslipidemias, is a risk factor for increased mortality. In contrast, a few studies have shown rather beneficial effect of raised BMI and are known as obesity paradox[9]. The present study was conducted to determine the frequency of raised BMI in patients presenting with acute myocardial infarction.

MATERIALS AND METHODS

This cross sectional study of 100 cases of MI was conducted at Department of Cardiology, Sheikh Zayed Hospital, Rahim Yar Khan during May 2016 to February 2017. Diagnoses was established with ECG changes and raised Troponin T levels). Socio demographic data including age, gender, height, weight (in kg) and BMI (kg/meter^2 on admission) along with clinical data about DM, HTN and type of MI (STEMI or NSTEMI) was recorded. Raised BMI was labelled when it was more than 25 kg/m^2.

Sample selection;

The cases were selected via non-probability, consecutive sampling with following criteria.

Inclusion criteria:

1. Both genders
2. Age 30 to 60 years
3. STEMI and NSTEMI

Exclusion Criteria:

1. Age less than 30 or more than 60 years
2. Cases with normal ECG.
3. Cases undergoing any surgical intervention during first 30 days.
4. Mortality due to any other cause except for cardiac event (like road traffic accident)

Statistical analysis

The data was entered and analyzed by using SPSS-17. Quantitative variables like age and BMI were assessed in mean ±SD. Qualitative variables like gender, DM, HTN, raised BMI (yes/no) and type of MI were presented as frequencies and percentages. Stratification was done on the basis of age, gender, DM, HTN and type of MI to see its effect on outcome variable i.e. raised BMI. Post stratification chi-square test was applied and $p < 0.05$ was taken as significant

RESULTS

In this study there were total 100 cases out of which 60 (60%) were males and 40 (40%) females with mean age of 53.14±5.76 years. There were 55 (55%) cases with age more than 50 years. There were 32 (32%) cases with DM and 40 (40%) with HTN while 72 (72%) had ST elevation MI. Raised BMI was seen in 40 (40%) of cases. This was significantly high in females where it affected 24 (60%) of cases as compared to 16 (26.67%) females with p= 0.01. This was more common in age group of 35 to 50 years (p=0.68) as shown in table 1. Raised BMI was common with DM but had equal distribution in cases with or without HTN as in table 2. There was almost equal distribution of raised BMI in cases of both STEMI and NSTEMI (Table 3) with p= 0.98.

	Raised BMI		P value
	Yes	No	
Gender			
Male	16 (26.67%)	44 (73.33%)	0.01
Female	16 (26.67%)	44 (73.33%)	
Age groups			
35 – 50 years	21 (46.67%)	24 (53.33%)	0.68
> 50 years	19 (34.55%)	36 (65.45%)	

Table 1: Correlation of BMI with Gender and Age

Co-morbids	Raised BMI		Total
	Yes	No	
Diabetes Mellitus			
Yes	15 (46.88%)	17 (53.12%)	32
No	25 (36.76%)	43 (63.24%)	68
Hypertension			
Yes	16 (40%)	24 (60%)	40
No	24 (40%)	36 (60%)	60

Table 2: BMI in Diabetes and Hypertension.

Type of MI	Raised BMI		Total
	Yes	No	
STEMI	28 (38.89%)	4 (61.11%)	72
NSTEMI	12 (42.86%)	16 (57.14%)	28
Total	40 (100%)	60 (100%)	100

MI= Myocardial Infarction
NSTEMI=Non ST segment elevation MI
STEMI= ST segment elevation MI

Table 3: Correlation of BMI with type of Myocardial Infarction

DISCUSSION

Acute myocardial infarction is a life threatening condition and commonly encountered entity in the emergency and cardiac settings. There are multiple modifiable and non-modifiable risk factors. Obesity is one of the most common of them and raised BMI is considered as most widely used tool to label it.

In this study the raised BMI was seen in 40 (40%) of cases. This was similar to studies done by Khan HS et al[10] and Parsa AF et al.[11] However, the latter found a high significance in cases with raised BMI and severity of disease with p= 0.001. Why this difference was found, it may be due to ethnic difference, because the study conducted in Pakistan had similar results to ours while this conducted in Africa may be though to interfere with racial differences.

Raised BMI was significantly high in females where it affected 24 (60%) of cases as compared to 16 (26.67%) females with p= 0.01 in cases of MI. This was also observed by the studies done by Walker SP and Rubinshtein R et al that also found high number of females with raised BMI.[12-13] The reason of high number of females can be due to endocrine causes and the life styles of the females in our region, as the males are more active and do the physical activity as compared to females, so it was seen higher in females.

Raised BMI was common with cases of DM. Many studies have reported this in their results.[14-15] The high number of ACS cases with raised BMI having co morbid of DM can be explained by the increased lipogenesis and deposition o fat in the subjects.

Conclusion

Raised BMI is an independent risk factor in cases of acute coronary syndrome. It is significantly high in number in female patients.

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