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RAISED BODY MASS INDEX (BMI) IN CASES OF ACUTE MYOCARDIAL INFARCTION

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Abstract:

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 Jinnah Hospital, Lahore and Sahiwal Medical college Sahiwal from July 2019 to December 2019 in which 200 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 200 cases out of which 120 (60%) were males and 80 (40%) females with mean age of 55.17±4.77 years. There were 64 (32%) cases with DM and 80 (40%) with HTN while 144 (72%) had ST elevation MI. Raised BMI was seen in 80 (40%) of cases. This was significantly high in females where it affected 48 (60%) of cases as compared to 32 (26.67%) females with p= 0.01. This was more common in age group of 35 to 50 years (p=0.68). 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 cases.*

Key words: *MI, Raised BMI, DM, HTN*

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INTRODUCTION:

Every year, more than 6 million patients present to the emergency department with chest pain, and the majority are subsequently admitted with concern for Myocardial infarction (MI), which is an acute emergency. 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) or Echocardiography if needed. On the basis of 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 that can be fatal and include 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]

There are numerous well documented risk factors associated with high risk of MI which include DM, HTN, Family history, Smoking, raised BMI.[5, 6]. Few of them like, smoking, HTN, DM and obesity are reversible and to deal with them can decreased the chances of mrobidity and mortality in such cases. [7, 8]

Regarding BMI, it is associated with more chances of DM, high insulin resistance, increase oxygen demand and dyslipidemias which are again risk factors for increase mortality. In contrast to this few study have shown rather beneficial effect of raised BMI and are known as obesity paradox[9].

OBJECTIVES:

To determine the frequency of raised BMI in patients presenting with acute myocardial infarction.

MATERIALS AND METHODS:

This was a cross section study that was conducted at Jinnah Hospital, Lahore and Sahiwal Medical college Sahiwal from July 2019 to December 2019 in which 200 cases of acute myocardial infarction (Diagnosed with ECG changes with raised Troponin T levels) were included. Socio demographic data like age (in years), gender (male/female), height (in meters), weight (in kg) and BMI (kg/meter^2 on admission) were taken and relevant clinical data was also collected i.e. DM (yes/no), HTN (yes/no) and type of MI (STEMI or NSTEMI). 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)

DATA ANALYSIS PROCEDURE:

The data was entered and analysed 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 200 cases out of which 120 (60%) were males and 80 (40%) females with mean age of 55.17±4.77 years. There were 110 (55%) cases with age more than 50 years. There were 64 (32%) cases with DM and 80 (40%) with HTN while 144 (72%) had ST elevation MI. Raised BMI was seen in 80 (40%) of cases. This was significantly high in females where it affected 48 (60%) of cases as compared to 32 (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.

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 80 (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 48 (60%) of cases as compared to 32 (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 lipogensis 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 cases.

TABLE 1: RAISED BMI WITH RESPECT TO DEMOGRAPHICS
n= 100

Gender	Raised BMI		Total	Significance
	Yes	No		
Male	16 (26.67%)	44 (73.33%)	60	p= 0.01
Female	24 (60%)	16 (40%)	40	
Age groups	**Raised BMI**		**Total**	**Significance**
	YES	**NO**		
35-50	**21** (46.67%)	**24** (53.33%)	**45**	**p= 0.68**
>50	**19** (34.55%)	**36** (65.45%)	**55**	

TABLE 2: RAISED BMI WITH RESPECT TO COMORBIDITIES
n= 100

DM	Raised BMI		Total	Significance
	Yes	No		
Yes	15 (46.88%)	17 (53.12%)	32	p= 0.43
No	25 (36.76%)	43 (63.24%)	68	
HTN	**Raised BMI**		**Total**	**Significance**
	YES	**NO**		
Yes	16 (40%)	24 (60%)	**40**	**p= 1.0**
No	24 (40%)	36 (60%)	**60**	

TABLE 3: RAISED BMI WITH RESPECT TO TYPE OF MI
n= 100

Type of ACS	Raised BMI		Total
	Yes	No	
STEMI	28 (38.89%)	44 (61.11%)	72 (30%)
NSTEMI	12 (42.86%)	16 (57.14%)	28 (70%)
Total	**40 (100%)**	**60 (100%)**	**100 (100%)**

p=0.98

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