

ORIGINAL ARTICLE

DEPRESSION IN MYOCARDIAL INFARCTION PATIENTS AT AYUB
TEACHING HOSPITAL ABBOTTABAD

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Background: There is a considerably high prevalence of depression in post myocardial infarction (MI) patients. This study was designed with an aim to detect depression in patients with acute MI admitted to the CCU at Ayub Teaching Hospital Abbottabad. **Methods:** This descriptive cross-sectional study enrolled 246 male and female patients with acute MI. The patients were interviewed on the 3rd day of admission and their answers were marked according to the HADS-D scale. **Results:** With a cut-off score of 11, the frequency of depression in study participants was 27.24% (n=67). No statistically significant association was found between the age and sex of patients and depression. **Conclusion:** Depression is fairly common following acute MI and the management plans should include a consultation with psychiatric for individualized management of depression in post myocardial infarction patients.

Keywords: Depression; Anxiety; Myocardial Infarction; Stress; Quality of Life

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INTRODUCTION

Depression is a mental disease characterized by low mood accompanied by low self-esteem and loss of interest or pleasure in normal enjoyable activities.¹ It is 5% in general population and is more prevalent in patients with medical illnesses such as 25% in diabetes, 8-57% in cancer and also in increased frequency in renal failure or liver insufficiency patients.² An Agency for Health Care Research and Quality Systematic Review stated that coronary heart disease patients meeting criteria for major depressive disorder are 20% and patient reported symptoms were present in up to 47% patients.³

There is a bidirectional relationship between coronary heart disease and depression, i.e., depression is an independent risk factor for coronary heart disease and coronary heart disease can cause depression.⁴ Compared to non-depressed patients post MI depression is associated with poor cardiac outcomes, poor quality of life, recurrent cardiac events, multiple admissions, increased health related costs and increased mortality.⁵ There are wide range of mechanisms through which depression badly affects the course of coronary heart disease including inflammation, endothelial dysfunction, increased platelet activity and aggregation, autonomic nervous system (ANS) dysfunction and behavioral factors like non adherence to prescribed medications, not maintaining healthy diet, smoking and no regular exercise etc.⁶

A meta-analysis studied associations between inflammatory markers, i.e., C-Reactive Proteins, Interleukin (IL)-1 and IL-6 in coronary

heart disease and cancer patients. Results showed that depression and these inflammatory markers are associated positively and there is dose-response relationship. This association was present in all types of studies using community and clinic based samples or those using clinical interviews or self-report measures of depression.⁷

Depression also causes autonomic nervous system dysfunction in which there is increased sympathetic nervous system activity and decreased parasympathetic nervous system activity. This causes Low Heart Rate Variability (HRV) which is a strong predictor of mortality in coronary heart disease patients. ANS also modulates inflammatory and coagulant responses and ANS dysfunction is thought to be one of the reason for increased inflammatory and coagulant responses in depressed patients as evident by increased levels of C-Reactive proteins, IL-1, IL-6, Tumour Necrosis Alpha, fibrinogen and platelet activation.⁸

Platelet activity and aggregation is increased in depressed patients with Myocardial Infarction. It was assessed by measuring platelet microparticles levels and platelet aggregation to ADP and serotonin which showed increased levels and aggregation.⁹

As depression not only causes a miserable life but there is a strong evidence from multiple trials that depression is associated with poor prognosis, An American Heart Association Science Advisory Panel recommends that patients who had an acute coronary event should be screened for depressive symptoms and further assessment and treatment if required.¹⁰

Depression is a proven bad prognostic marker in post MI patients. Results of Sertraline Antidepressants Heart Attack Randomized Trial (SADHART) states that failure of antidepressants had a strong and independent association with long term mortality in MI patients.¹¹

It has been observed that in the developing world traditional risk factors for coronary heart diseases are increasing and an alarming prediction states that by year 2020 cardiovascular diseases will be the major contributor to morbidity and mortality in these populous developing nations of the world including India and Pakistan.¹² In a cross sectional study conducted in Northern India depression was found to be present in 16–47% of post MI patients.¹³ Pakistan is the 9th populous country with total population of about 180 million and 34th among 37 low income countries. Social problems are the major contributors towards anxiety and depression and its overall prevalence in our country is 34% which is higher than the developed countries.¹⁴

Depression in MI patients is a neglected aspect of this disease in our country as evident from limited availability of data on this topic. This advocates a very sincere look into this important matter and this study will help in assessing the magnitude of depression in MI patients and will also help the clinicians and public health experts for planning and addressing the problem in order to decrease load on our specialized health care facilities, decrease health related costs, decrease Years Lost due to Disabilities (YLDs) and more importantly decrease the miseries and improve the quality of life of MI patients.

MATERIAL AND METHODS

The study objective was to determine the frequency of depression in myocardial infarction patients at Ayub Teaching Hospital Abbottabad. Myocardial infarction was defined as typical chest pain and associated ST segment elevations of 1mm or more than 1mm in two or more than two contiguous limb leads or 2mm or more than 2mm elevations in two or more than two contiguous precordial leads on ECG or having positive cardiac biomarkers (Trop-T, CK-MB) in individuals with compatible clinical history. A diagnosis of depression was made for individuals whose score on HADS-D (Hospital Depression and Anxiety Scale) was at least 11.^{15,16} The study was conducted in the Department of Cardiology, Ayub Teaching Hospital, Abbottabad from 1st January to 31st October 2013.

It was a descriptive cross-sectional study enrolling 246 patients with acute myocardial infarction. This number was arrived at using the World Health Organization (WHO) software for

sample size calculation in health statistics. The sample size required for estimating the population proportion with specified absolute precision of 5% at 95% confidence interval was calculated considering 20%³ of ACS patients with depression. The following formula was used for calculating the required sample size:

$$n = \frac{Z^{2(1-\alpha/s)} P(1-P)}{d^2}$$

Non-probability consecutive sampling was done. Patients of both genders and 30–70 years of age admitted in Cardiology Unit of Ayub Teaching Hospital Abbottabad with 1st episode of MI were included in this study. The exclusion criteria involved patients having Valvular Heart Disease, any type of Cardiomyopathy, and patients already taking anti-depressants. Patients were enrolled to this study from admitted patients in Cardiology Unit of Ayub Teaching Hospital, Abbottabad. Prior approval from the hospital ethics committee was obtained. Use of data for research and publication was explained to the patients and/or their relatives, and informed consent was obtained. All patients as per inclusion and exclusion criteria were interviewed on 3rd day of hospital admission using structural clinical interview Hospital Anxiety and Depression Scale and total number of points scored by the patients were later calculated. A cut-off score of 11 was determined for the diagnosis of depression in patients with acute myocardial infarction. The data as analysed using SPSS 16.0. Quantitative variables like age and score were described in terms of Mean±SD and categorical variables i.e. gender and depression were described as frequencies and percentages. Stratified analysis based on age and gender with respect to score was done. Post stratification Chi-square test was applied and a $p \leq 0.05$ was taken as significant.

RESULTS

There were 130 (52.85%) male and 116 (47.15%) female study participants. The mean±SD age of study participants was 56.02±5.21 years. The youngest study participant was 48 years old, while the age of oldest study participant was 65 years. The mean±SD HADS-D score for the study participants was 8.41±3.17. The lowest score was 4 and highest score was 15 for the study participants. Depression, as defined by the cut-off HADS-D score of 11 or more was present in 67 (27.24%) study participants. Sixty-six (26.83%) were found to have a borderline depression because their scores were between 8-10. No depression was found in the rest of study participants (n=113; 45.93%).

No statistically significant association was found between HADS-D score of study participants and

participant's age and sex ($p>0.05$) when independent sample t -test was applied. Similarly, when depression was stratified according to age and sex, no statistically significant association was observed.

Table-1: Cross tabulation of depression and sex of study participants

Depression	Sex of patients		Total	p-value
	Male	Female		
No Depression	95.00	84.00	179.00	0.91
Depression present	35.00	32.00	67.00	
Total	130.00	116.00	246.00	

Table-2: Cross tabulation of depression and age of study participants

Depression in patients	Age of patients		Total	p value
	Up to 56 years	More than 56 years		
No Depression	92.00	87.00	179.00	0.93
Depression present	34.00	33.00	67.00	
Total	126.00	120.00	246.00	

DISCUSSION

Depression has recently been recognized as a risk factor for adverse medical outcomes in patients with acute myocardial infarction (AMI). A variable prevalence of depression following myocardial infarction has been reported in literature depending on a number of factors including but not limited to the prevalence of depression in the general population and the tools used to detect depression. The prevalence of depression in our study was 27.24% based on a cut-off score of 11 on the Hospital Anxiety and Depression Scale (HADS-D). A review of available evidence reported that the prevalence of depression varied according to the tools used for detecting depression, for example, structures interviews were able to identify major depression in 19.8% of patients with acute myocardial infarction, significant depressive symptoms were detected in 31.1% of patients using Beck's depression inventory (BDI). The detection rates varied with the cut-off point used on the HADS from 15.5% at a cut-off score of 8–7.3% at a cut off score of 11.¹⁷

Recently, Kala and colleagues studied the prevalence of post myocardial infarction depression in patients treated by PCI and reported that depression was highest (21.1%) 24 hours after PCI.¹⁸ However, the researchers reported, there was a significant decrease in the depressive symptoms at the time of discharge (9.2%) and the symptoms decreased further with the passage of time when the patients were followed for 12 months.¹⁸ A recent study from Taiwan, Republic of China, reported that the risk of post myocardial infarction depression was high in women and in patients aged 45–64 years of age.¹⁹ Such association was not observed in our study, perhaps because of lack of younger patients with myocardial infarction in this study. The lack of

association with gender in our study can be explained due, perhaps, to a relatively high background rate of depression. Additionally, history of no antidepressant use by the patient was considered sufficient for inclusion in the study and, hence a reporter's bias cannot be ruled out.

A study from India reported a prevalence of 23.8% for depression in patients who had a myocardial infarction.¹³ The study evaluated patients for depressive symptoms at a follow-up visit four to six weeks after acute myocardial infarction. The study observed that more patients with symptoms of depression or sub-syndromal symptoms were smokers and overweight/obese or had been diagnosed with hypertension and diabetes mellitus.¹³ We did not study calculate such risks in our study. Another study published recently reported that a 42% frequency of depression in patients following an acute myocardial infarction.²⁰

The frequency of depression in our study is quite high when compared with studies from the developed world. For example, the recently published TRIUMPH study reported that depression was present in 759 (18.7%) patients after acute myocardial infarction.²¹ The researchers reported that among these patients, mortality at 1 year after myocardial infarction was significantly higher for patients with untreated depression when compared with those with treated depression.²¹

In view of small sample size, and the fact that study sample was not representative of the general population, therefore, the results of this study should be approached with caution. We did not consider pre-myocardial risk for the anxiety/depression in each patient and factors such as tobacco smoking, socio-economic status, educational qualification, past history of ischemic heart disease, diabetes and other systemic diseases were not considered in study population. Additionally, we did not follow up patients for a longer duration after discharge from the hospital. Therefore, it is difficult to estimate the prevalence of chronic depression in patients with myocardial infarction

CONCLUSION

Depression is fairly common following acute MI and the management plan should include a consultation with psychiatric for individualized management of depression in post myocardial infarction patients.

AUTHORS CONTRIBUTION

SM: Substantial contribution to conception and design, acquisition of data, analysis and interpretation of data for intellectual content and final approval of

the study to be published. UH, ARJ, MNK, HNK, SA: Drafted and revised the manuscript, reviewed the tables, contributed to conception and design, analysis and interpretation of data. MM, BI: Contributed to acquisition of data.

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