

A follow-up study on post myocardial infarction depression in a tertiary healthcare centre of Assam

Abstract

Background: Major depressive disorder is widely prevalent in post myocardial infarction (MI) period. Various studies have reported a significant relationship between these two major disease states. **Aim:** To examine depression after MI and its socio-demographic variation. **Methods:** The study was a follow up study on patients of acute MI (n=50) attending cardiology outpatient department of the Assam Medical College Hospital in four to six weeks after the index event. Screening was done by the Primary Care Evaluation of Mental Disorders and diagnoses of major depressive disorder were established according to the text revision of the fourth edition of the Diagnostic and Statistical Manual for Mental Disorders criteria. Severity of the depression was assessed by the Beck Depression Inventory. Study populations were again reassessed after eight weeks from the index event. Statistical software packages like SPSS-20, XLSTAT, and Microsoft Office Access were used for analysis. **Results:** Twenty eight and 32% of the study subjects were depressed on their first and second visit respectively. **Conclusion:** Similar pattern of post MI depression is found in our state likewise in correlation to western and Indian studies which were conducted in different states. So we recommend vigilance from the clinician's side while handling cases of MI.

Keywords: Coronary Artery Disease. Diagnostic and Statistical Manual of Mental Disorders. Major Depressive Disorder.

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Introduction

Coronary artery disease (CAD) or ischaemic heart disease (IHD) "is a blockage or narrowing of the arteries that supply blood to the heart muscle, often due to a buildup of fatty plaque inside the arteries. A severe enough blockage may cause a heart attack. If not quickly treated, the blockage can cause parts of the heart muscle to die".[1] The World Health Organization estimated in 2004 that 12.2% of worldwide deaths were from IHD, with it being the leading cause of death in high or middle income countries and second only to lower respiratory infections in lower income countries.[2] Coronary heart disease (CHD) prevalence appears to be worsening in India. In developed countries, IHD is predicted to raise 30-60% between 1990 and 2020. In developing countries, rates are predicted to increase by 120% in women and 137% in men from 1990 to 2020.[3] A study conducted in 2006 from rural Andhra Pradesh, India states that among 1354 deaths, 32% deaths were due to IHD.[4]

Depression is a widely prevalent disease. Kessler *et al.* [5] reported lifetime prevalence of depression is 16.6%. According to the global burden of disease study 2010, major depression is a significant risk factor for CHD [6] Clinical depression was found to be an independent risk factor for death, five years after the acute myocardial infarction (MI). Even minor depression increased the risk

of dying. Although it is not yet known whether treating depression can improve survival.[7] Various studies have demonstrated that depression is widely prevalent among patients who have experienced an episode of MI. They have administered different psychiatric disorder assessment tools like Beck Depression Inventory (BDI), Hamilton Depression Rating Scale (HDRS), Mini International Neuropsychiatric Interview etc. on their patients and reported that the prevalence of post MI depression is 20-32%.[8-15] Heart rate variability (HRV), an index of cardiac autonomic control, is reduced in depression, and reduced variability has been shown to be a predictor of sudden death in cardiac patients. HRV is even lower in depressed patients with CAD as compared to non-depressed patients with CAD.[16]

In comparison to the west, very few studies have been done in India, especially in the northeast region. This study along these lines intends to find whether the comparable scenario of post MI depression has been seen in our state also, and additionally, with the goal that we can take a holistic approach to their problems and relieve them of their distress.

Materials and method

Study area: The study was done in Assam Medical College Hospital (AMCH), which is a tertiary care center situated in Dibrugarh.

The design of the study: The study subjects were 50 randomly selected diagnosed cases of MI from the Cardiology outpatient department. The period of the study was one year (June 2012-May 2013). Socio-demographic information was gathered as per the prepared standard questionnaire. Ethical approval and consent of the patients were obtained in the initial portion of the study. Patients were evaluated for screening of depression by using the Primary Care Evaluation of Mental Disorders (PRIME-MD) Patient Health Questionnaire (PHQ) after four to six weeks from an attack of MI, as by that time the normal psychological reaction to MI is supposed to have settled.

During screening, patients who were detected to be experiencing depression and fulfilling the criteria according to the text revision of the fourth edition of the Diagnostic and Statistical Manual of Mental Disorder (DSM-IV-TR) were selected for the study. Later on, BDI was applied to assess the severity of depression. Patients were reassessed again after eight weeks from the index event.

The aim of the study: To study depression after an episode of MI and its socio-demographic variation.

Inclusion criteria: a) Both male and female patients, b) Age between 21-70 year, c) Diagnosed cases of MI as per redefined acute MI criteria.[17]

Exclusion criteria: a) Patients aged more than 70 years were left out as there will be a heavier hazard of other co-morbid physical illness as well as psychological issues associated with old age, b) Patients with other co-morbid medical illness and history of other psychiatric disorders.

Tools which were used in the study are: a) Informed consent form, b) Proforma for socioeconomic data, c) PRIME-MD PHQ, d) DSM-IV-TR, e) BDI.

Informed consent form: A self-designed informed consent form, which explains the nature of the study, the contents of which were explained in vernacular language, was read out to the subjects of study and their signatures or thumb prints in case of illiterates were obtained. They were also explained that they could leave the study if they desired without their treatment being affected in any manner.

Proforma for socioeconomic data: A self-designed form to collect personal and socio-demographic details of the subjects had been used.

PRIME-MD PHQ: A diagnostic tool containing modules on five different mental health disorders was developed in the mid-1990s. The PHQ-9, a tool specific to depression, simply scores each of the nine DSM-IV criteria based on the mood module from the original PRIME-MD.[18]

DSM: DSM, published by the American Psychiatric Association, provides a common language and standard criteria for the classification of mental disorders. DSM-IV-TR was published in 2000.[19]

BDI: BDI, created by Aaron T Beck, is a 21-question multiple-choice self-report inventory; one of the most widely used instruments for measuring the severity of depression.[20] BDI is a clinician scale. We have administered the Assamese version of the scale to the Assamese speaking population.

Translated Assamese version of BDI was used in this study, which was used earlier also.[21] The cutoff score of BDI was as per the interpretation provided with the scale. The standard cutoffs are as follows:[22]

- 0–9: Indicates minimal depression
- 10–18: Indicates mild depression
- 19–29: Indicates moderate depression
- 30–63: Indicates severe depression.

Statistical data analysis: The information has been analysed using statistical software packages like SPSS, XLSTAT, and Microsoft Office Access.

Results

Analysis of the study population suffering from depression has shown that 28 and 32% of the population were depressed in their first and second visits respectively. In the first visit, eight per cent were mildly depressed, 16% were moderately depressed, and four per cent were severely depressed. In the second visit, eight, 20, and four per cent were depressed mildly, moderately, and severely respectively. Results have been demonstrated in Table 1.

Cross tabulation analysis has been carried out of different variables with reference to two population groups, i.e. a group with no depression and a group suffering from depression. In case of gender, distribution reveals that 25% among the population suffering from depression were females and 75% were males. As far as the religion, 75% were Hindu and rest 25% were Muslim. While coming to marital status, 81.25% were married, but only 18.75% were unmarried. In the event of locality, 43.75 and 37.5% were from rural and semi-urban background respectively. Regarding the type of family, 68.75% were from nuclear families, 31.25% were from joint family; persons from extended family have not shown depressive symptoms. Examination of educational level depicts 31.25% of the depressed population group had completed high school certificate, 25% primary school, and 25% had completed graduation or post graduation. Only 12.25% people were illiterate. In case of occupation, 37.5% were unemployed, and the

Table 1: Distribution of the study population based on depression

Depression	Sex				Total	Total (%)	Total % of depression
	Male	%	Female	%			
1 st visit							
No	27	54	9	18	36	72	28
Mild	2	4	2	4	4	8	
Moderate	6	12	2	4	8	16	
Severe	2	4	0	0	2	4	
Total	37	74	13	26	50	100	
2 nd visit							
No	25	50	9	18	34	68	32
Mild	2	4	2	4	4	8	
Moderate	8	16	2	4	10	20	
Severe	2	4	0	0	2	4	
Total	37	74	13	26	50	100	

rest (62.5%) were employed. 37.5% of the population suffering from depression belonged to lower middle socioeconomic class, and the rest belonged to upper middle (56.25%) and upper lower (6.25%) socioeconomic class. Descriptive analysis of the study population with reference to depression has shown following distribution. The results are presented in Table 2.

Discussion

In our study, 14 (28%) out of 50 patients developed depression in their first visit. Two more patients developed depression in their subsequent visits, i.e. a total of 32% patients developed depression approximately eight weeks after the attack of MI. Among depressed, ten, 18, and four per cent had mild, moderate, and severe depression respectively. Our study results are very nearly as per the past studies like Lane *et al.*, [8] Lauzon *et al.*, [9] Calderón *et al.*, [10] Mavrides and Nemeroff, [11] Wheeler *et al.*, [12] Manjarrez-Gutiérrez *et al.*, [13] that have reported depression in 16-32% of the population who has suffered from an episode of MI. Our study results are likewise as per previous Indian studies like Mahapatra *et al.*, [14] and Agarwal *et al.*, [15] also additionally. Like our study, aforementioned previous studies have used standard tools like BDI, HDRS, etc. to assess depression. In our northeast region, particularly in our state, studies have been carried out to evaluate depression in post MI period. Anyhow they are less reported. Our study place, i.e. AMCH is a tertiary care centre for healthcare in Assam. It plays a dominant role in treating and management of patients with MI, mainly from the state. So, our study plans to figure out whether the comparable scenario of post MI depression is observed in our patients.

However, the current study contrasts from the investigations of Martin *et al.*, [23] and Kessler *et al.*, [24] who have reported depression in only ten to 16% of post MI people. The discoveries of present study which are not as per the prior studies conceivably because of difference in methodological approach and furthermore because of the smaller number of patients inspected in the present study.

While remarking on socio-demographic variation of major depressive disorder (MDD) of our study population, similar trend has been observed in terms of age, marital status, type of family, and locality in comparison to earlier reports. [25,26] We have watched that middle aged group, married, persons belong to rural areas and nuclear families are more prone for development of MDD. In any case, divergence with past reports has been found in our study regarding gender, educational status, socioeconomic status, and occupational status. They have reported that major depression is more common in females in comparison to males, lower socioeconomic and educational status. [25-27] The conceivable clarifications for these aberrations could be because of low number of specimen size in our work; along with we have searched depression in a specific population, i.e. who has suffered from MI especially in a tertiary care institute. In case of religion, we have seen that Hindu peoples were more affected with post MI in correlation to the other alternative groups. No previous report has been sought which are searched manually and through web to compare our results in terms of variation of post MI depression in connection to religious groups.

Table 2: Descriptive overview of the study population with reference to depression

Sl. no.	Variables	Depression		Total	% against depressed group
		No (n=34)	Yes (n=16)		
1	Age (in years)				
	21-30	3	0	3	0
	31-40	3	1	4	6.25
	41-50	5	3	8	18.75
	51-60	14	9	23	56.25
	61-70	9	3	12	18.75
	Total	34	16	50	100
2	Sex				
	Male	25	12	37	75
	Female	9	4	13	25
	Total	34	16	50	100
3	Religion				
	Hindu	30	12	42	75
	Muslim	2	4	6	25
	Christian	2	0	2	0
	Total	34	16	50	100
4	Marital status				
	Unmarried	7	3	10	18.75
	Married	27	13	40	81.25
	Total	34	16	50	100
5	Locality				
	Rural	19	7	26	43.75
	Semi-urban	11	6	17	37.5
	Urban	4	3	7	18.75
	Total	34	16	50	100
6	Type of family				
	Nuclear	25	11	36	68.75
	Extended	6	0	6	0
	Joint	3	5	8	31.25
	Total	34	16	50	100
7	Education				
	Illiterate	0	2	2	12.5
	Primary school	5	4	9	25
	Middle school	11	1	12	6.25
	High school	7	5	12	31.25
	Graduate or post graduate	11	4	15	25
	Total	34	16	50	100
8	Occupation				
	Unemployed	11	6	17	37.5
	Unskilled worker	4	0	4	0
	Semiskilled worker	5	1	6	6.25
	Skilled worker	2	2	4	12.5
	Clerical/shop owner/farmer	10	7	17	43.75
	Semi professional	2	0	2	0
	Total	34	16	50	100
9	Socioeconomic status				
	Upper middle (II)	14	9	23	56.25
	Lower middle (III)	18	6	24	37.5
	Upper lower (IV)	2	1	3	6.25
	Total	34	16	50	100

The possibility of evolution of depressive symptoms or full blown depressive disorder after an attack of MI depends upon biological and various psychological factors as suggested by many studies. Acute MI induces sympathetic activation of hypothalamo-pituitary axis dysfunction, platelet activation, increased level of cytokine, decreased variability in heart rate, overall poor physical condition, increased rate of hospitalisation, unemployment, stress and lack of social support, etc. which may ultimately lead to a depressive episode.[28-32]. So, as time went there were more probability of impact of these psychosocial factors, and eventually caused a disturbed psychological state. This could be a conceivable clarification for the increment in number of depressed individuals in the subsequent visits. A recent study also has demonstrated that among CAD patients, carriers of the short allele of the serotonin transporter promoter region gene (5-HTTLPR) are more vulnerable to depression.[33,34]

Summary and conclusion

The end of investigation uncovers that the onset of myocardial injury has a considerable association connection with the occurrence of depression. Our study has limitation like a low number of sample size. Anyway our study was of one year span. Alongside with we needed to exclude all co-morbid medical illnesses including hypertension and diabetes mellitus, which were always part and parcel of MI. Thus, on that point was a deficient opportunity to get an extraordinary number of samples for the study.

A similar trend of post MI depression is found in our state also in comparison to western and Indian studies which were conducted in different states. So we suggest vigilance from the clinician's side while handling cases of MI. Patients with positive screening results ought to be assessed by an expert qualified in the diagnosis and management of depression. Management of depression in these groups of patients improves treatment compliance, lifestyle modification, and thereby leading to a better quality of life.

Future direction

This study holds its value in the preventive psychiatry. Our study is showing the need of screening for depression in a cardiology setup.

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