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Analysis of the influence of various coronary heart disease risk factors on the chances of occurrences of post-Myocardial Infarction Depression.

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ABSTRACT

Major depressive disorder is usual in patients experiencing an episode of myocardial infarction. Different coronary heart disease risk factors do influence the chances of occurrence of post-Myocardial Infarction Depression. The purpose of this work was to test the influence of various coronary heart disease risk factors on the chances of occurrences of the post-Myocardial Infarction Depression. The study was conducted on Patients of Acute myocardial infarction (n=100) attending cardiology Out Patient Department of Assam medical college, Dibrugarh, Assam in 4 to 6 weeks after the index event. The screening was done by The Primary Care Evaluation of Mental Disorders and diagnoses of Major Depressive Disorder were established according to the Diagnostic and Statistical Manual for Mental Disorders fourth edition Test Revision criteria. The severity of the depression was assessed by Beck Depression Inventory. Logistic regression analysis was utilized for the analysis. Among the four coronary risk factor variables past history of Myocardial Infarction was found to be influencing the chances of occurrence of post-MI depression (p = 0.015, Wald = 5.910). Persons having past history of Myocardial Infarction are more susceptible to develop post-Myocardial Infarction Depression.

Keywords: Myocardial infarction, major depressive disorder, Coronary Heart Disease.

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INTRODUCTION

Ischemic Heart Disease, otherwise called Coronary Artery Disease (CAD), is a condition that affects the supply of blood to the heart. The blood vessels are constricted or obstructed due to the deposition of cholesterol on their walls and ultimately leading to plaque formation.[1] This reduces the supply of oxygen and nutrients to the heart muscles, which is essential for proper functioning of the heart. This may eventually result in a portion of the heart being suddenly deprived of its blood supply leading to the death of that area of heart tissue, resulting in a heart attack.[1] The cardinal feature of CAD is chest pain, typically on exertion, and, oftentimes, there are no symptoms until an acute coronary event occurs. In developing countries, rates are predicted to increase by 120% in women and 137% in men from 1990 to 2020.[2] CAD prevalence appears to be worsening in India. According to the global burden of disease study 2010, major depression is a significant risk factor for coronary heart disease. [3] The incidence of depression symptoms following myocardial infarction (MI) is a very common psychological problem among patients with MI. This psychological problem has negative impacts on the prognosis of the cardiac disease. [4]

Various risk factors for coronary artery disease are mainly Smoking, Family history of heart disease, obesity, and low physical activity, etc.. [5,6] Studies have demonstrated that people who have a history of past Myocardial Infarction are more prone to develop post Myocardial Infarction Depression.[5, 6] here we are attempting to analyze the influence of coronary heart disease risk factors on the chances of occurrence of post Myocardial infarction.

MATERIALS AND METHOD

Study area: The study was done in Assam medical college, which is a tertiary care center situated in Dibrugarh, Assam.

The design of the study: The study subjects were randomly selected diagnosed cases of Myocardial infarction(number of sample size: 100) from the Cardiology Outpatient Department. The period of the study was 1year (June 2012-May 2013). Socio-demographic information was accumulated 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 the screening of depression by using PRIME-MD, PHQ (Primary care evaluation of mental disorder - patients with health questionnaire)[7] after 4-6weeks from an attack of MI, as by that time the normal psychological reaction to MI is supposed to resolve.

During the screening, patients who were discovered to be experiencing depression and fulfilling the criteria according to the Diagnostic and Statistical Manual of mental disorder IV Text Revision were selected for the survey. Later on Beck Depression Inventory (BDI) scale was applied to assess the severity of depression.

The aim of the study:

To examine the influence of coronary heart disease risk factors on the chances of occurrence of post-Myocardial Infarction Depression.

Inclusion criteria:

a) Both male and female patients, b) Age between 21-70 year. c) Diagnosed cases of MI as per redefined AMI criteria. [6]

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) patient with other co-morbid medical illness and history of other psychiatric disorders

Tools which are used in the study are: a) Informed consent form b) Proforma for socioeconomic data c) Prime MD PHQ d) Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV)

Prime MD PHQ

Proforma for socioeconomic data:

A self-designed form to collect personal and socio-demographic details of the subjects has been used. This contains details about identification data like name, age, sex, residential address, marital status, type of family, the number of persons in the family, the details of earning family and the total monthly income of the family from all sources.

PRIME-MD PHQ: (The Primary Care Evaluation of Mental Disorders)

PRIME-MD: 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.[7]

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.[8]

RESULTS AND DISCUSSION

The bulk of the survey subjects were male (74%), married (80%), lower middle economic class (48%) and Hindu (84%). 32% of them had the previous history of MI, 54% of them had their anterior wall involvement and inferior wall involvement was seen in case 46 % of patients. 32% of the study group were discovered to be depressed at around 4-6 weeks after the index event.

During statistical analysis the depressed group is split into two groups, i.e. depressed and non-depressed. While investigating the extent of the relationship between socio-demographic

variables like age, gender, religious belief, marital condition, domicile status, job, locality and per capita income with depression by student t-test and logistic regression method, no Statistically significant difference was understood between the two groups in terms of above mentioned social-demographic variables (p >0.5). Age has been examined independently by student t-test as here age and scores of depression both are continuous variable.

Cross tabulation analysis has been carried out of different variables with reference to two population groups, i.e. a group with no depression and group suffering from depression. In the case of gender, distribution reveals that 25% of the population suffering from depression are females and 75% are males. As far as the religion, 75% are Hindu and rest 25% were Muslim. While coming to marital status, 81.25% are married, but only 18.75% are unmarried. In the event of locality, 43.75% and 37.5% are from rural and semi-urban background respectively. Regarding the type of family 68.75% is from nuclear families, 31.25% are from joint family, persons from extended family have not shown depressive symptoms. Examination of educational level depicts 31.25% of the depressed population group has completed high school certificate, 25% primary school and 25% have completed graduation or post graduation. Only 12.25% peoples are illiterate. In the case of occupation, 37.5% are unemployed, and the rest (62.5%) is employed. 37.5% of the population suffering from depression belong to the lower middle socioeconomic class, and the rest belongs to the upper middle (56.25%) and upper lower (6.25%) socio-economic class. Descriptive analysis of the study population with reference to depression has shown following. Table 1 shows the descriptive overview of the study population with reference to depression

Table:1: Descriptive overview of the study population with reference to depression

Sl. no	Variables		Depression		Total	% Against depressed group
			No (n=68)	Yes (n=32)		
1	Age-category	21-30	6	0	6	0
		31-40	6	2	8	6.25
		41-50	10	6	16	18.75
		51-60	28	18	46	56.25
		61-70	18	6	24	18.75
	Total		68	32	100	100
2	Sex	Male	50	24	74	75
		Female	18	8	36	25
	Total		68	32	100	100
3	Religion	Hindu	60	24	84	75
		Muslim	4	8	12	25
		Christian	4	0	4	0
	Total		68	32	100	100
4	Marital status	Unmarried	14	6	20	18.75

		Married	54	26	80	81.25
	Total		68	32	100	100
5	Locality	Rural	38	14	52	43.75
		Semi urban	22	12	34	37.5
		Urban	8	6	14	18.75
	Total		68	32	100	100
6	Type of family	Nuclear	50	22	72	68.75
		Extended	12	0	12	0
		Joint	6	10	16	31.25
	Total		68	32	100	100
7	Education	Illiterate	0	4	4	12.5
		Primary school certificate	10	8	18	25
		Middle school certificate	22	2	24	6.25
		High school certificate	14	10	24	31.25
		graduate or post graduate	22	8	30	25
	Total		68	32	100	100
8	Occupation	Un employed	22	12	34	37.5
		Unskilled worker	8	0	8	0
		Semiskilled worker	10	2	12	6.25
		Skilled worker	4	4	8	12.5
		Clerical/shop owner / farmer	20	14	34	43.75
		Semi profession	4	0	4	0
	Total		68	32	100	100
9	Socio-economic status	Upper middle(II)	28	18	46	56.25
		Lower middle(III)	36	12	48	37.5
		Upper Lower(IV)	4	2	6	6.25
	Total		68	32	100	100

Descriptive overview of the coronary risk factors of the study population

Descriptive analysis based on coronary heart disease risk factors like history of smoking, history of hypertension, family history of heart disease and previous history of episodes of Myocardial Infarction have shown following distribution. The result is presented in the table2 below:

Table: 2: Distribution of sample population based on coronary risk factors

		Sex				Total	Total (%)
		Male	%	Female	%		
H/O smoking	No	15	30	8	16	23	46
	Yes	22	44	5	10	27	54
Total		37	74	13	26	50	100
H /O hypertension	No	25	50	10	20	35	70
	Yes	12	24	3	6	15	30
Total		37	74	13	26	50	100
Family h/o heart disease	No	19	38	5	10	24	48
	Yes	18	36	8	16	26	52
Total		37	74	13	26	50	100
Previous history of MI	No	25	50	9	18	34	68

	Yes	12	24	4	8	16	32
Total		37	74	13	26	50	100

The distribution shows that 44% of the male were smoker, whereas only 10% females were smoker. The attributing fact may be a higher prevalence of smoking among men. The table depicts that 30% of patients had a history of hypertension. 24% of male patients against only 6% of females had a history of hypertension. Descriptive analysis of the above variable has shown that 52% of the study sample had a family history of heart disease. Among them, males were contributing 36% of them. Above analysis has shown that 32% of the sample respondents had a previous history of myocardial infarction. While the majority of the respondents 68 % did not have any previous history of myocardial infarction.

While studying the influence of coronary heart disease risk factors on depression by Logistic regression method, it has been revealed that only one factor, i.e. histories of myocardial infarction had a strong influence on depression (p-value =0.015). Thus, respondents with a prior history of myocardial infarction were found to be prone towards developing a depressive disorder. The other three variables, i.e. history of smoking, family history of heart disease and history of hypertension were not found to have any bearing on depression (p=0.156, p=0.110, p= 0.150)

Table: 3: Analysis of the relationships of occurrence of depression on three coronary risk factor variables of sample respondents.

Sl. no	Coronary risk factor variables	Wald	Odds ratio	CI	P value	Remark
1	H /O smoking	2.008	2.475	0.707-8.66	0.156	N.S
2	Family h/o . Hypertension	2.560	2.787	0.794-9.77	0.110	N.S
3	H/O Myocardial Infarction	5.910	4.959	1.364-18.03	0.015	Significant
4.	H/O Hypertension	2.060	2.528	0.71-8.96	0.151	N.S

N.S-not significant

The analysis in the present study reveals that socio-demographic variables like age, sex, marital status, occupation, socioeconomic status, religion, locality and type of family does not exhibit any significant impact on post-MI depression. The present study is in accordance with the previous study like Agarwal et al 2011,[5] Bagherian et al 2013,[4] who revealed no association between above-mentioned variables with post-MI depression.

In our study, no influences of coronary risk factors have been observed in depression, except the previous history of MI, which has statistically significant relationship with a probability of depression. . The present study has similarity with the previous studies, like Bagherian et al 2013[4] who reported no association between coronary risk factors like Family history of cardiac disease, smoking, history of hypertension, etc. and depression. Agarwal et al 2011[5] have also found a similar type of results in the case of family history of heart disease. But a

study done by Agarwal et al 2011[5] has depicted a significant association between variables like smoking and development of depression in post-MI patients. Our study has failed to demonstrate these associations may be due to less number of cases.

CONCLUSION

This study was undertaken to determine the percentage of depression in MI patients and impact of depression in patients following myocardial infarction. Our study result shows that all the seven socio-demographic profile variables viz. Sex, Marital status, Type of family, Locality, socioeconomic status, Education, Religion have no influence on the development of depression in post-MI patient. The result of analysis reveals that only among the clinical risk factor variables, one factor, i.e. histories of myocardial infarction have a strong influence on depression. Thus, respondents with a prior history of myocardial infarction are found to be prone towards developing a depressive disorder. Here we recommend routine screening for depression in patients with coronary heart disease in various settings, including the hospital, physician's office, clinic, and cardiac rehabilitation center, etc. The opportunity to screen for and treat depression in cardiac patients should not be missed, as effective depression treatment may improve health outcomes. The role of caregiver is also crucial here. Caregiver forms the bridge between the patient and the physician. A study has shown the vital role of the caregiver in managing the psychological problems of the patient.[9] Past history of myocardial infarction may predispose the individual for more physical, social and economic burden which can explain the more chances of occurrence of depressive symptoms in this group of the population.[10,11, 12, 13] Patients with positive screening results should be evaluated by a professionally qualified person 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. Our study has certain limitations. Firstly the sample taken was small. A larger sample would have been more representative one. Secondly, more number of visits would have been more conclusive.

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