

Prevalence of Depression and Associated Factors in Patients with Acute Coronary Syndrome

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Abstract—Background: Acute Coronary Syndrome (ACS) is a major health problem which is associated high mortality and morbidity. Depression is one of the major psychological symptoms among patients with Acute Coronary Syndrome (ACS) but may remain underdiagnosed and undertreated. The study aimed to measure the frequency of depressive symptoms among patients with Acute Coronary Syndrome and different factors associated with it. Methodology: A prospective observational study was carried out for a period of one year in cardiac department of the hospital. Total 400 patients with Acute Coronary Syndrome (ACS) selected for the study. Patient's socio demographic factors, duration since diagnosis, co morbidities associated with Acute Coronary Syndrome and intervention at the time of diagnosis were collected from interview methods and patient medical records. Hamilton Depression Rating scale (HAM -D) was administered to assess the depressive symptom among patients with ACS. Results: Of the 400 ACS patients 65.5% were males and 34.5% were females. Mean age of the male and female were 63.67 ± 10.62 and 66.71 ± 8.98 respectively. A large prevalence of ACS was found in the age group 61-70years. The large proportions of ACS patients were under depressive symptoms. ACS more commonly associated with male patients whereas the depressive symptoms more predominant in women. The study revealed that, depressive symptoms significantly correlated with age, gender, duration since diagnosis and the number of co morbidities associated with ACS. Conclusion: It can be concluded that, large proportion of ACS patients were under depressive symptoms. Hence, it is advisable for the proper screening of depression in this population for earlier intervention especially patients who already presented with multiple risk factors.

Keywords—Acute Coronary Syndrome (ACS), Myocardial Infarction (MI), ST Segment Elevated MI (STEMI), Non ST Segment Elevated MI (NSTEMI), Hamilton Depression Rating Scale (HAM-D).

I. INTRODUCTION

According to World Health Organization (WHO) 2017, Cardiovascular diseases are the number one condition causing death globally (17.7 million people annually), of these 7.4 million deaths are due to Coronary Artery Diseases (CAD)¹. Among various Coronary Artery Diseases (CAD), Acute Coronary syndrome (ACS) is more common life threatening

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condition caused by the blockage of blood to the heart muscle (myocardial ischemia)². Depression is common among patients with Acute Coronary Syndrome (ACS) and it is three times more common in patients after an ACS³. World Health Organization (WHO) has estimated that by the year 2020, Depression and Coronary Artery Disease (CAD) will be prime reason of Disability Adjusted Life Years (DALY)⁴. Association between depression and ACS is well established; these are very common and are coexisting disorders⁵

Aim of the study was to assess the depression among patients with Acute Coronary Syndrome and different factors associated with it.

II. METHODOLOGY

This was a prospective observational study conducted in department of cardiology. Four hundred participants diagnosed with ACS were included by systematic random sampling method. Written informed consent was obtained from all the study subjects. The study protocol was approved by Institutional Ethics Committee (IEC). Semi structured questionnaire was administered to the patients in order to collect data about socio demographic factors, duration since diagnosis and co morbidities associated with ACS. Type of ACS and intervention at the time of MI were collected from patient medical records. Occurrence of co morbid depression was screened by Hamilton Depression Rating scale (HAM - D).

A. Inclusion Criteria

- Participant's men and women aged 18 – 80 with ACS.
- Patients who visit emergency department with classic chest pain ECG changes suggestive of ACS.
- Patients with Non ST Segment Elevated Myocardial Infarction (NSTEMI), ST Segment Elevated MI (STEMI) and Angina Pectoris (AP) were included in this study.

B. Exclusion Criteria

- Pregnant women
- Patients with a history of psychiatric disorder were excluded from the study.
- Patients diagnosed with depression and cognition were excluded from the study.
- Patient who was taking anti depressant medicines excluded

from the study because these medication may alter depressive symptom.

- Patients who were not clinically stable enough for evaluation.

C. Instrument

Hamilton Depression Rating Scale (HAM - D) has been used as a tool to accurately assess the depressive symptoms. HAM – D is a most widely used observer rated instrument designed to assess and quantify the depressive symptoms^{6, 7}. In this scale cut off point used was 0 – 7 Normal; 8 – 13 for mild depression; 14 -18 for moderate depression; 19 – 22 for severe depression and >23 for very severe depression^{8, 9}.

III. STATISTICAL ANALYSIS

The data and results were tabulated and calculated using Statistical Program for Social Science (SPSS) version 21 for windows software. Continuous variables were described in mean and standard deviation. Categorical data were expressed as percentage and corresponding frequency. Statistical comparison of socio demographic variables between male and female were done with Chi – square and t – tests for categorical and continuous variable. Linear regression analysis was employed to determine the correlation between continuous variable. Pearson correlation coefficients were used to examine the age, number of co morbidities and duration of diagnosis associated in post ACS with degree of depression. A value of $P < 0.05$ (test of significance at 5% level) was considered statistically significant where as $P = 0.001$ is taken as highly significant.

IV. RESULTS

The purpose of the study was to assess the prevalence of depressive symptoms in patients with ACS by means of HAM-D scale. Although numerous studies that find out the frequency of depression in patients with ACS by using different scales like Beck Depression Inventory (BDI), Patient Health Questionnaire (PHQ-9) and Hospital Anxiety and Depression scale (HADS). To our knowledge, this is one of the few

reports in south India that measure the incidence rate of depressive symptom among post ACS patients by means of Hamilton Depression Rating (HAM-D) scale. In the present study we tried to correlate various factors associated with ACS and their influence on depression severity.

A. Sample Characteristics

A total of 400 patients were enrolled in this study of this, 262 (65.5%) men and 138 (34.5%) women. The mean age of the total sample was found to be 64.72 ± 10.17 with a range of 35 to 80 years. Mean age of male was 63.67 ± 10.62 and female was 66.71 ± 8.98 . The mean age of female was found to be more than that of male that was statistically significant ($t = 2.865$, $df = 398$, $p = 0.003$), suggesting that women tend to undergo ACS in their later stage of the life. This may be due to the protective role of women sex hormones¹⁰. The majority of people were in the age group between 61-70 years followed by 71 -80 years. Among different age groups ACS was highest in male patients with an age between 61 -70 (36.3%) years followed by 71-80 years (27.5%). Whereas, in female with ACS more commonly found in the age between 71- 80 yrs (37.7 %) followed by 61-70 (35.5%). Males compared to females, there was a similar prevalence of NSTEMI (38.5% Vs 39.1%) and Angina Pectoris (AP) (38.9% Vs 41.3%). But, male gender was more associated with severe form of ACS (STEMI) compared to female. Neither marital status, duration since diagnosis nor the number of co morbidities statistically correlated with gender in our study (all P value > 0.05). Among different treatment modality PTCI and CABG were significantly higher in males as compared to females. But in contrast, female (83.3%) preferred medical treatment more compared to males and is statistically significant. Comparisons of age with sex 94.2% female patients were above 50 years of age but, only 87.1 % males were in this group. 2.7% of male patients below the age of 40 years. In contrast, it was found that there were no females with ACS in this age group. Our study shows a statistically significant relation between type of living and intervention with gender. Table:1.

TABLE 1:

ASSOCIATION OF BASELINE CHARACTERISTICS OF POPULATION WITH GENDER

Variable	Category	Male (N = 262)	Female (N= 138)	χ^2 , df	P-Value ^a
Age (In Years)	31 – 40	07 (2.7)	00 (0.0)	9.041, 4	0.060
	41 - 50	27 (10.3)	08 (5.8)		
	51 - 60	61 (23.3)	29 (21.0)		
	61 - 70	95 (36.3)	49 (35.5)		
	71 – 80	72 (27.5)	52 (37.7)		
Marital Status	Married	252 (96.2)	129 (93.5)	1.462, 1	0.227
	Unmarried	10 (3.8)	19 (6.5)		
Type of Living	Live alone	12 (4.6)	18 (13.0)	9.367, 2	0.009*
	Spouse + Children	181 (69.1)	88 (63.8)		
	Spouse	69 (26.3)	32 (23.2)		
Diagnosis	AP	102 (38.9)	57 (41.3)	0.503, 2	0.778
	NSTEMI	101 (38.5)	54 (39.1)		
	STEMI	59 (22.5)	27 (19.6)		
Duration Since Diagnosis	<6 months	85 (32.44)	46 (33.33)	3.367, 5	0.644
	6 – 1 Yr	18 (6.88)	11 (7.97)		
	1 – 2 Yr	32 (12.21)	11 (7.97)		
	2 – 5 Yr	49 (18.70)	30 (21.73)		
	5 – 10 Yr	34 (12.98)	22 (15.94)		
	>10 Yr	44 (16.79)	17 (12.3)		
Intervention at the time of MI	Medical	185 (70.6)	115 (83.3)	7.827, 2	0.020*
	PTCI	68 (26.0)	20 (14.5)		
	CABG	9 (3.4)	3 (2.2)		

AP: Angina Pectoris, MI: Myocardial Infarction, NSTEMI: Non ST Segment Elevated MI, STEMI: ST Segment Elevated MI, PTCI: Percutaneous Transluminal Coronary Intervention, CABG: Coronary Artery Bypass Graft. ^aPearson’s chi-squared test, P<0.05 (* Significant), df = degree of freedom.

B. Depression

The mean HAM-D score was found to 17.94 ± 7.13 with a range of 2 to 46. The mean depression score of the male and female patients were found to be 17.7 ± 7.095 and 19.41 ± 7.013 respectively. Women had significantly greater depression score compared to men which was found to be statistically significant (t = 3.020, df = 398, P = 0.003).According to the result of the study, three fourth of the ACS patients had depressive symptoms. This was higher than the results obtained from other studies and can be justified by the fact that the difference in the sample size, type of screening tool used, cut off point for diagnosis and evaluation criteria.

Among depression severity, very severe depression was associated with females 42 (30.4%) compared to males 56 (21.4%). Mild depression was more seen in males 68 (26.0%) as compared to females 18 (13.0%). Majority of males have not been observed with any depressive symptoms when compared with females {19(7.3%) Vs 4(6.3%)}. Concerning gender wise prevalence of ACS and Depression, depressive symptoms were more frequently found in female patient with ACS (P = 0.014). Whereas, ACS was more predominant in male. The prevalence of depression among patient with ACS and gender is shown in Table 2.

TABLE II: DISTRIBUTION OF PARTICIPANTS ACCORDING TO THE DEPRESSION SEVERITY AND GENDER

Gender	Depression Severity					P -Value
	Normal	Mild	Moderate	Severe	Very Severe	
MALE	19 (7.3)	68 (26.0)	65 (24.8)	54 (20.6)	56 (21.4)	0.014*
FEMALE	6 (4.3)	18 (13.0)	36 (26.1)	36 (26.1)	42 (30.4)	

The data suggests that, depression severity was independently associated with different type of ACS (P = 0.379), marital status (P = 0.120). The Pearson correlation coefficients were 0.044 and .076 respectively. According to the result of the study, depression severity was highly correlated with age, gender, duration since diagnosis and the number of co morbidities associated with ACS (Table:3). Among these, age and duration since diagnosis showed a strong positive correlation with depression severity (P value < 0.01).

TABLE III: CORRELATION BETWEEN DIFFERENT VARIABLES WITH DEPRESSION SEVERITY

Variable	r value ^a	P value
Age	0.502**	< 0.01
Sex	0.150**	0.003
Duration since diagnosis	0.525**	< 0.01
Co morbidities associated with ACS	0.225**	0.001

** Correlation is highly significant at the 0.01 level (2 tailed), a:- Pearson correlation coefficient.

Simple linear regression analysis was performed to find out the strength of association between these variables. Thus, a simple scatter dot plot with a fitting line was used for further

quantifying their relationship revealed a strong positive, statistically significant, correlation between age and depression severness in patients with ACS.(Figure:1)

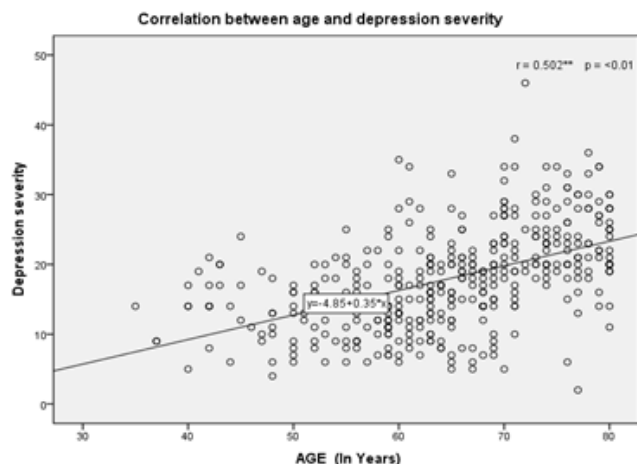


Fig. 1: The correlation between age of the population and Depression severity

Deviations could be seen in the depressive symptoms according to the age. We also found that, depressive symptoms were more frequently reported in the age group between 61 – 70 (36%) followed by 71 –80 (31%).

V. LIMITATIONS OF STUDY

Our study has a few limitations. The key limitation is, it is a single centre study conducted in a tertiary care hospital. Hence, the result cannot be generalized. Large multicentre studies are required to confirm our study results. In addition, long term cohort studies should be carried out to identify the level of depression in their initial stage of diagnosis of ACS and their progression during the course of time.

VI. CONCLUSION

The study has identified that, a large proportion of patients with Acute Coronary Syndrome are depressive. As expected, increasing age, number of co morbidities and duration since diagnosis are the major risk factors for the prevalence of depression among patients with ACS. This study indicates the need of assessment of depression symptoms in early stages of ACS. Screening should be done to find depression in this population for earlier intervention especially in patients who presented with multiple risk factors. Better outcome and quality of life can be achieved by managing both Depression and ACS concurrently.

VII. ACKNOWLEDGEMENT:

We would like to acknowledge Doctors and all other staff of department of Cardiology and Cardiac Care Unit (CCU). We would like to thank all the patients who were involved in the study.

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