

DEPRESSION IN VARIOUS ETHNIC GROUPS OF PAKISTAN AFTER PRIMARY PERCUTANEOUS CORONARY INTERVENTION

Ahmed Ali^{a*}, Khalid Iqbal^a, Dileep Kumar^a, Tahir Sagheer^a, Suresh Kumar^a, Chander Parkash^a

^aNational Institute of Cardiovascular Diseases, Karachi.

Date of Submission : 09-04-2022; Date of Acceptance: 09-05-2022; Date of Publication: 30-09-2022

ABSTRACT:

BACKGROUND: *Depression is very common among individuals recovering from a chronic illness with long-term or recurrent hospitalization. Post-myocardial infarction patients are at risk of developing depression and is considered to be a risk for elevated mortality.*

AIMS & OBJECTIVE: *To determine the frequency of depression among various ethnic groups of patients post primary percutaneous coronary intervention for acute myocardial infarction.*

MATERIAL & METHODS: *A cross-sectional study was conducted at the out-patients department of NICVD, Pakistan for a duration of six months from February 2021 to July 2021. Total 256 patients aged between 18 to 85 years, were diagnosed with STEMI, and had undergone PCI were included in the study. Patients with prior diagnosis of CAD or had prior history of psychological problems were excluded from the study. Patients were interviewed for depression by using Beck's depression inventory (BDI). Patients scoring > 10 were labeled as having depression.*

RESULTS: *Out of 256 patients, 122 (48.8%) patients were screened positive for depressive symptoms. Out of these, about 21.1% had mild depression, 16% had borderline clinical depression, 10.5% had moderate depression, while about 0.8% had severe depression. Age of 71 years and above, female gender, diabetes, hypertension, and sedentary lifestyle were all significantly correlated with increased risk of depression in post-MI patients with BDI scores of 17.64 ± 7.9 ($p < 0.0001$), 13.54 ± 7.53 (0.015), 14.47 ± 7.61 ($p < 0.0001$), 13.52 ± 6.83 ($p < 0.0001$), and 16.69 ± 7.57 ($p < 0.0001$), respectively.*

CONCLUSION: *After percutaneous coronary intervention for MI, depression was found in almost half of the patients. However, as per our study, the risk for depression is independent of ethnic background.*

KEY WORDS: *Acute coronary syndrome, depression, ethnicity, myocardial infarction, primary percutaneous intervention.*

Correspondence : Ahmed Ali, National Institute of Cardiovascular Diseases, Karachi. Email: drahmed_phulpoto@yahoo.com

Author's Contribution: AA: Conducted the study and wrote the article. KI: Helped in conducting the study and article writing. DK: Gave frequent advises during the study and did corrections in manuscript. TS: Helped in data collection and data analysis. SK: Helped in rearranging the data and tables. CP: Data analysis and proof reading.

INTRODUCTION:

Depression is very common among individuals recovering from a chronic illness with long-term or recurrent hospitalization.¹ Post-myocardial infarction patients are at risk of developing depression and is considered to be a risk for elevated mortality.² According to the previous research, the incidence of depression among those with acute myocardial infarction (MI) is about 65% while the rate for major depression is 15-22%.³ Post MI patients with adjunctive depression or anxiety may lead to a poor prognosis and may even exacerbate recurrent cardiovascular events.⁴

Doi Kanno et al., explored factors associated with increased risk of depression in MI patients who underwent percutaneous coronary intervention. According to the study, there were several risk factors including sex, pre-intervention depression, history of mental health illness, smoking, length of hospitalization, dietary intake, among others that were associated with depression among MI patients who have undergone PCI.⁵ Several other studies have also evaluated similar patterns.^{6,7}

Evidence suggests that depression is a significant risk factor for substantial morbidity and mortality in patients in the post myocardial phase.⁷ Some researchers have recommended that all patients of myocardial infarction should be psychologically evaluated from time to time; however, this practice has yet to be adopted by many healthcare centers.⁸⁻¹⁰ Due to limited local data and inconsistencies in the existing literature, the authors conducted the current study at a cardiology care center in Sindh, Pakistan. The aim of this study was to determine the frequency of depression among various ethnic groups of patients post primary percutaneous coronary intervention for acute myocardial infarction.

MATERIAL AND METHODS:

A cross-sectional study was conducted at the out-patients department of NICVD, Karachi for a duration of six months from February 2021 to July 2021. Study was conducted after the approval from institutional review board. A non-probability convenience sampling technique was employed to recruit study participants. A sample size for the study was calculated using 22% of expected percentage of depression and anxiety³, 95% confidence level, and 5% margin of error sample size for the study is calculated to be 264 patients.

All patients aged between 18 to 85 years, irrespective of gender, were diagnosed with

STEMI, and had undergone PCI were included in the study. Patients with prior diagnosis of CAD, patients who refused to give consent, or had prior history of psychological problems, or any other chronic illness like arthritis, CRF malignancy and debilitating cerebral stroke were excluded from the study.

ST-Elevation Myocardial Infarction (STEMI) was diagnosed in patient with any two of the following criteria;

1. Typical chest pain >20 minutes (retrosternal pain with radiation to left arm or shoulder, aggravates on exertion or emotional stress, relieved with rest or nitroglycerin)
2. New ST elevation in at least two contiguous leads >2mm in men or >1mm in women in leads V2 to V3 and/or of >1mm in other contiguous chest leads or limb leads.

Informed consent was obtained from all the patients. Patients were interviewed for depression by using Beck's depression inventory (BDI). Patients scoring > 10 were labeled as having depression. Patients were categorized into mild, moderate, high and very high depression. Data was entered and analyzed using Statistical Package for Social Science Version 23 (SPSS). Mean and standard deviation was determined for continuous variables while for all categorical variables, frequency and percentage were calculated. The Chi-square test and student t-tests were applied to evaluate the association between risk factors and the depression severity and scores. A p-value of ≤ 0.05 was set as cut off for statistical significance.

RESULTS:

The mean age of participants was 53.94 ± 10.18 years with a monthly household mean of PKR $73,241 \pm 51,331.45$. The majority of the patients were between the ages of 51-60 years. 141 (55.1%) of the participants were Urdu speaking (Table 1). About 122 (48.8%) patients were screened positive for depressive symptoms.

A mean BDI Score was 11.46 ± 6.93 . The severity of depression was categorized into five groups. Almost half of the participants i.e. 131 (51.2%) had a BDSI score between 1-10 (Normal). About 21.1% had mild depression, 16% had borderline clinical depression, 10.5% had moderate depression, while about 0.8% had severe depression (table 1).

Age of 71 years and above, female gender, diabetes, hypertension, and sedentary lifestyle were all significantly correlated with increased risk of depression in post-MI patients with BDI scores of

Table 1. Socio-demographic and clinical characteristics of the patients.		
Demographics		N=256
Mean Age (years)		53.94 ± 10.184
Monthly Household Income (PKR)		73,241 ± 51,331.45
Age Group	25-40 years	26 (10.2%)
	41-50 years	79 (30.9%)
	51-60 years	86 (33.6%)
	61-70 years	52 (20.3%)
	71+ years	11 (4.3%)
Gender	Female	54 (21.3%)
	Male	201 (78.7%)
Mother Tongue	Urdu	141 (55.1%)
	Sindhi	68 (26.6%)
	Pashto	21 (8.2%)
	Others	25 (9.8%)
Education	Uneducated	84 (32.8%)
	Graduate	71 (27.7%)
	Intermediate	31 (12.1%)
	Matric	58 (22.7%)
	Primary	11 (4.3%)
Residence	Urban	198 (77.5%)
	Rural	57 (22.4%)
Diabetes mellitus		83 / 256 (32.4%)
Hypertension		150 / 256 (58.6%)
Smoking		103 / 256 (40.2%)
Sedentary lifestyle	Yes	49 (19.1%)
	No	207 (80.9%)
Mean BDI Score		11.46 ± 6.93
BDSI Grade	1-10 = These ups and downs are considered normal	131 (51.2%)
	11-16 = Mild mood disturbance	54 (21.1%)
	17-20 = Borderline clinical depression	41 (16%)
	21-30 = Moderate depression	27 (10.5%)
	31-40 = Severe depression	2 (0.8%)

17.64 ± 7.9 (<0.0001), 13.54 ± 7.53 (0.015), 14.47 ± 7.61 (p<0.0001), 13.52 ± 6.83 (p<0.0001), and 16.69 ± 7.57 (p<0.0001), respectively (Table 2).

There was no significant association between ethnicity and depression severity in patients with a recent history of myocardial infarction (Table 3).

DISCUSSION:

Many pieces of research reinforce the verdict that depression is common among chronically ill and afflicted patients. About one out of every five inpatients of MI potentially hold a symptomatic

depression profile during their recovery period.¹¹

In people with glucose and lipid metabolism disorders¹² two of the primary causes of coronary artery disease (CAD), depression is a significant factor. However, set across the scale of ethnicity, our study establishes no significant association amid ethnic divisions and post-MI depression, along with other sociodemographics and co-morbid.

In the present study, as many as half the patients (approximately 48%) who had MI suffered from depressive symptoms. Out of these, one-fourth of patients were diagnosed with clinically significant

Variables		BDI Score (mean ± SD)	P-value
Age Group	25-40 years	7.15 ± 6.06	<0.0001
	41-50 years	9.72 ± 6.01	
	51-60 years	11.85 ± 6.69	
	61-70 years	14.44 ± 6.69	
	71+ years	17.64 ± 7.9	
Gender	Female	13.54 ± 7.53	0.015
	Male	10.97 ± 6.64	
Mother tongue	Urdu	12.48 ± 7.27	0.094
	Sindhi	10.48 ± 6.31	
	Pashto	10.14 ± 6.35	
	Others	9.96 ± 6.19	
Education	Uneducated	12 ± 7.45	0.179
	Graduate	9.87 ± 5.16	
	Intermediate	12.48 ± 5.83	
	Matric	12.45 ± 8.06	
	Primary	10.64 ± 7.8	
Residence	Urban	11.85 ± 6.78	0.139
	Rural	10.32 ± 7.25	
Diabetes Mellitus	Yes	14.47 ± 7.61	<0.0001
Hypertension	Yes	13.52 ± 6.83	<0.0001
Smoking	Yes	12.17 ± 7.16	0.195
sedentary lifestyle	Yes	16.69 ± 7.57	<0.0001

BDI Grades	Ethnicity				P-value
	Urdu	Sindhi	Pashto	Other	
1-10 = These ups and downs are considered normal	70(53.4%)	36 (27.5%)	10(7.6%)	15(11.5%)	0.302
11-16 = Mild mood disturbance	28(51.9%)	15 (27.8%)	7(13%)	4(7.4%)	
17-20 = Borderline clinical depression	21(51.2%)	14(34.1%)	1(2.4%)	5(12.2%)	
21-30 = Moderate depression	20(76.9%)	2(7.69%)	3(11.5%)	1(3.8%)	
31-40 = Severe depression	2(100%)	0(0%)	0(0%)	0(0%)	

depression. A study by May et al. reinforces our finding with 15% of their CAD cases bearing clinical manifestations of depressive disorder.¹³ Generally, the proportion of severe depression among CAD patients ranges from 10% to 30%, with even more individuals reporting some degree of depressive symptoms.¹⁴

Ethnic stratification reveals that the Urdu-speaking subset forms the largest segment of participants afflicted with a history of MI. Therefore,

they report the highest figures of depression amongst them, with the severest grade only existing in this lot (2 patients identified with severe depression as opposed to none in the other population segments).

ACS has been linked to depression in numerous research. Using Beck's Depression Inventory (BDI), it was discovered to be 46.7% in one study¹⁵ and 43.5 percent in Brazil (BDI).¹⁶ This is in line with our study that records approximately 49%

of the participants expressing the symptoms of depression. Our study suggests gender predilection of depression for females that numbered 54 with a mean BDI score of 13.54 ± 7.53 , compared with 201 males with a mean of 10.97 ± 6.64 . Various other studies reinforce this correlation where females were shown to be more depressed than their male counterparts.¹⁷

While some studies indicate depression in cardiac patients is more prevalent in the rural segment of Pakistan¹⁸, exacerbated by already strained socioeconomic status, our study proves no significant statistical differences between the rural and urban areas. A recent study recorded less than 10% post-PCI patients with depressive symptomatology¹⁷ as opposed to our results and other local¹⁹ and western literature.

This review exhibits a correlation between depression and adverse cardiovascular events after percutaneous coronary intervention and offers health experts empirical proof to facilitate PCI patients with psychological intervention.

Our study bears the limitation of being a single-center study, a population-based survey would have yielded more precise frequencies. Due to limited sample size, the present study findings cannot be

generalized to a larger population. Secondly, Pakistan with an upsurging population is still subjected to strict COVID-19 restrictions hence, the limited time allotment per patient for interaction and data collection kept us from investigating various other elements of depression symptomatology. Despite the limitations, the study fully achieved its objectives and the insight it was built on with adequate sample size. In-person interviews instead of just filling out the questionnaire and assessment based on the latest ACS management method; PCI, make our research distinctive.

Further research is necessary in order to find out the impact of depression on long-term patient outcome and also to assess whether severe depression is associated with increased risk of recurrent myocardial infarction.

CONCLUSION:

Our study indicated that depressive symptoms were common in patients who underwent percutaneous coronary intervention for myocardial infarction. Almost one-fourth of the patients suffered from borderline to severe depression. However, our study did not find any correlation between ethnicity and increased frequency of depression.

References:

1. Niedzwiedz CL, Knifton L, Robb KA, Katikireddi SV, Smith DJ. Depression and anxiety among people living with and beyond cancer: a growing clinical and research priority. *BMC cancer*. 2019 Dec;19(1):1-8.
2. Ziegelstein RC. Depression in patients recovering from a myocardial infarction. *Jama*. 2001 Oct 3;286(13):1621-7.
3. Barefoot JC, Schroll M. Symptoms of depression, acute myocardial infarction, and total mortality in a community sample. *Circulation*. 1996;93:1976
4. Van Melle J.P., de Jonge P., Spijkerman T.A., et al. (2004) Prognostic association of depression following myocardial infarction with mortality and cardiovascular events: a meta-analysis. *Psychosom Med* 66:814–822.
5. Doi-Kanno M, Fukahori H. Predictors of depression in patients diagnosed with myocardial infarction after undergoing percutaneous coronary intervention: a literature review. *Journal of Medical and Dental Sciences*. 2016;63(2-3):37-43.
6. Ford DE, Mead LA, Chang PP, Cooper-Patric L, Wang NY, Klag MJ. Depression is a risk factor for coronary artery disease in men: the precursors study. *Arch Intern Med*. 1998;158:1422–6.
7. Carney RM, Rich MW, Freedland KE, Saini J, Tevelde A, Simeone C, Clark K. Major depressive disorder predicts cardiac events in patients with coronary artery disease. *Psychosom Med*. 1988;50:627–33.
8. Carney RM, Freedland KE, Rich MW, Jaffe AS. Depression as a risk factor for cardiac events in established coronary heart disease, a review of possible mechanisms. *Am Behav Med*. 1995;17:142–9.
9. Frasure-Smith N, Lesperance F, Talajic M. Depression and 18-month prognosis after myocardial infarction. *Circulation*. 1995;91:999–1005.
10. Ladwig KH, Kieser M, Konig J, Breithardt G, Borggrete M. Affective disorders and survival after acute myocardial infarction: results from the post infarction late potential study. *Eur Heart J*. 1991;12:959–64.
11. Bush DE, Ziegelstein RC, Patel UV, Thombs BD, Ford DE, Fauerbach JA, McCann UD, Stewart KJ, Tsilidis KK, Patel AL, Feuerstein CJ. Post-Myocardial Infarction Depression: Summary. *Ahrq evidence report summaries*. 2005 May.

12. Vural M, Acer M, Akbař B. The scores of Hamilton depression, anxiety, and panic agoraphobia rating scales in patients with acute coronary syndrome. *Anatolian Journal of Cardiology/Anadolu Kardiyoloji Dergisi*. 2008 Feb 1;8(1).
13. May HT, Horne BD, Knight S, Knowlton KU, Bair TL, Lappé DL, Le VT, Muhlestein JB. The association of depression at any time to the risk of death following coronary artery disease diagnosis. *European Heart Journal-Quality of Care and Clinical Outcomes*. 2017 Oct 1;3(4):296-302.
14. Rudisch B, Nemeroff CB. Epidemiology of comorbid coronary artery disease and depression. *Biological psychiatry*. 2003 Aug 1;54(3):227-40.
15. Perez GH, Nicolau JC, Romano BW, Laranjeira R. Depression and acute coronary syndromes: gender-related differences. *Arquivos brasileiros de cardiologia*. 2005;85:319-26.
16. Dessotte CA, Silva FS, Bolela F, Rossi LA, Dantas RA. Presence of depressive symptoms in patients with a first episode of acute coronary syndrome. *Revista Latino-Americana de Enfermagem*. 2013;21:325-31.
17. Mujtaba SF, Sial JA, Karim M. Depression and anxiety in patients undergoing percutaneous coronary intervention for acute coronary syndrome. *Pakistan Journal of Medical Sciences*. 2020 Jul;36(5):1100.
18. Sheehan DV. Depression: underdiagnosed, undertreated, underappreciated. *Managed care (Langhorne, Pa.)*. 2004 Jun 1;13(6 Suppl Depression):6-8.
19. Maqsood S, Jehangiri AU, Khan MN, Hayat U, Ajmal S, Mushtaq M, Shah SF, Khan HN. Depression In Myocardial Infarction Patients At Ayub Teaching Hospital Abbottabad. *Journal of Ayub Medical College, Abbottabad: JAMC*. 2017 Oct 1;29(4):641-4.