Assessment of depression, anxiety and quality of life in patients with coronary artery disease

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Abstract

Background:

Coronary artery disease (CAD) is the most common type of cardiovascular disease. Depression and anxiety are common in people with CAD and are associated with worse cardiac outcomes and quality of life.

Objectives:

To estimate the prevalence of anxiety and depression, and to find the effect of anxiety and depression on the quality of life in patients with CAD visiting cardiology outpatient at Manmohan Cardiothoracic Vascular and Transplant Center, Tribhuvan University from November 2019 to October 2020.

Materials and Methods:

The study was a cross-sectional design comprising a total sample size of 96. Socio-demographic and clinical profiles were obtained using a semi-structured proforma. A validated Nepali version of the Hospital Anxiety and Depression Scale (HADS) was used to assess anxiety and depression. ICD-10 DCR was further used to categorize anxiety and depressive disorders. Quality of life was assessed using WHOQOL-BREF.

Results:

The majority of the participants were of the age group 40-64 years (61.5%) were male (70%) and had a diagnosis of ST elevation myocardial infarction (STEMI) (57.3%). Anxiety disorder was present in 27.1% and depressive disorder in 20.9% of patients with CAD. The WHO-QOL-BREF scores were significantly negatively correlated with the HADS A score across domain one ($p<0.05$) and domain two ($p<0.05$) and also negatively correlated with the HADS D score across all four domains($p<0.05$).

Conclusion:

A significant proportion of patients with coronary artery disease suffer from anxiety and depression. The presence of comorbid anxiety and depression significantly affects their quality of life.

Keywords:

Anxiety, Coronary Artery Disease, Depression, Quality of life, WHOQOL-BREF

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INTRODUCTION

Coronary artery disease (CAD), also known as coronary heart disease or ischemic heart disease is the major cause of Disability Adjusted Life Years (DALYs) in high-income countries and ranks only third in low and middle-income countries after unipolar major depression and road traffic accidents (RTA). [1, 2] The relationship between CAD and psychiatric disorders is bidirectional [3]. Patients with CAD are frequently affected with mental health challenges, with depression and anxiety being especially common. The prevalence rates of depression and anxiety varied among studies and ranged from 15-60% across the globe. [4,5,6,7,8,9] American Heart Association and the European Society of Cardiology guidelines on CAD management have emphasized the need to screen and treat depression in patients with CAD. [10,11]

Quality of life is an individual's perception of their position in life in the context of the culture and value systems in which they live, concerning their goals, expectations, standards, and concerns. [12] CAD has a fluctuating and chronic course and can interfere significantly with day-to-day activities of patients [13]. Coronary artery disease and psychiatric conditions each independently have a negative impact on patients' quality of life. [14,13]

All these facts call for further research to understand the interrelationships between psychiatric comorbidities and CAD. Additionally, there is a significant lack of research exploring quality of life among individuals with coronary artery disease . This is especially true when considering the context of low- and middle-income countries like Nepal. Further, this study will advocate for the integration of mental health services within cardiovascular care, encouraging healthcare systems to adopt multidisciplinary treatment models that address both physical and mental health needs. These findings also highlight the importance of investing in mental health resources within cardiology departments for integrated care in settings with limited resources. Thus, this study is an attempt in this direction.

MATERIALS

This study is a cross-sectional Observational study. The study site was Manmohan Cardiothoracic Vascular and Transplant Centre, Tribhuvan University out patient department. The study period was one year from November 2019 to October 2020. The study comprised a total sample size of 96 and the purposive sampling technique was used.

Socio-demographic and clinical profiles were obtained using a semi-structured proforma. A validated Nepali version of the Hospital Anxiety and Depression Scale (HADS) was used to assess anxiety and depression.[15] International Classification of Disease 10th version diagnostic criteria for research (ICD-10 DCR) was further used to categorize anxiety and depressive disorders.[16] Quality of life was assessed using the World Health Organization Quality of Life bref (WHOQOL-BREF).[12] Permission for the use of all tools was taken from the respective authors and organizations. Ethical approval was taken from the Institute of Medicine, and Institutional review committee, and informed consent was taken from all the patients.

Inclusion criteria include patients aged 18 years or above, belonging to either gender and fulfilling the criteria for CAD (myocardial infarction with ST-segment elevation, myocardial infarction without ST-segment elevation, unstable angina, and chronic stable angina). Patients having delirium, amnesic syndrome, dementia, patients with intellectual disability who may not be able to communicate due to speech disorder, patients having other systemic illnesses except for hypertension and dyslipidemia, those unable to participate or uncooperative due to any reason and who do not give consent for the study were excluded from the study.

SPSS version 25 was used for data entry and analysis. Data distributions were examined for normality and analyzed using descriptive statistics such as frequencies, means, and standard deviation. Student 't' test, Pearson's correlation analysis and Chi-square tests were applied to find out the relationship between the variables. A P-value of less than 0.05 was taken as statistically significant.

RESULTS

The sociodemographic and clinical profile of the study population has been presented in Table 1. Table 1 shows that the majority of the participants belonged to the age group 40-64 years (n=59,61.5%). The mean age of the sample population was 57.63±11.62 years. A total of 59.4 % (n=57) had a diagnosis of STEMI, and 33.3% (n=32) had a diagnosis of NSTEMI. The mean duration of coronary artery disease onset was 56.71±11.169 years and the majority had the duration of CAD between 1 month and 1 year (n=43, 44.8%). The majority of the participants had only one coronary event (n=81, 84.4%), and had undergone invasive procedures (n=72,75%) and had the co-morbidity of hypertension (n=60, 62.5%)

Anxiety caseness was found in (n=26) 27.1 % of the participants. The mean HADS A score in the anxiety caseness group was 12.56±1.850. Thus, anxiety disorder was found in 27.1 % of the participants. The most common anxiety disorder diagnosis was generalized anxiety disorder (n=11,12%) followed by panic disorder (8%), specific phobia (4%), and anxiety disorder not otherwise specified (3%). Depression caseness was found in 21.9 % (n=21) of the study population. The mean HADS D score in the depression caseness group was 13±1.456. Thus, the prevalence of depressive disorder was 21.9 %. The most common depressive disorder diagnosis was a mild depressive episode (n=12, 13%) followed by adjustment disorder (brief depressive reaction) (5%), moderate depressive episode (3%), and dysthymia (1%).

The mean scores across WHOQOL BREF domain 1 (physical health), domain 2 (psychological health), domain 3 (social relationship), and domain 4 (environmental health), were 50.66±10.27, 60.30±12.05, 68.30±9.791, 69.81±7.572 respectively. Table 2 shows the relationship between the four WHOQOL-BREF domain scores with HADS-A and HADS-D scores. All four domain scores were negatively correlated with the HADS-A score and statistically significant across domain 1, domain 2, and domain 4 ($p< 0.05$). All four domain scores were negatively correlated with the

HADS-D score and statistically significant across all four domains (p<0.05).

Table 3 shows the mean WHOQOL-BREF scores were lower across all four domains in the patients with the presence of anxiety disorder than those without anxiety disorder. This difference in mean scores was statistically significant only across WHOQOL-BREF domain 1 (p=0.0001), and domain 2 (p=0.0001), but not in domain 3 (p=0.889) and domain 4 (p=0.182).

Likewise, Table 4 shows that the mean WHOQOL-BREF scores were lower across all four domains in patients with the presence of depressive disorder compared to those without a depressive disorder. The difference was statistically significant across all four domains of WHOQOL-BREF (p<0.05).

Table 1: Sociodemographic and clinical variables of the study population

Sociodemographic and clinical variables	Frequency (N=96)	Percentage (%)
Age groups (years)		
18-39	4	4.2
40-64	59	61.5
65 above	33	34.4
Gender		
Male	67	69.8
Female	29	30.2
Diagnosis of the patient		
STEMI	55	57.3
NSTEMI	32	33.3
Unstable Angina	7	7.3
Chronic Stable Angina	2	2.1
Duration of CAD		
<1 month	25	26
1 month-1 year	43	44.8
1 year-5 year	23	24
>5 years	5	5.2
History of Hypertension		
Yes	60	62.5
No	36	37.5
History of Dyslipidaemia		
Yes	16	16.7
No	80	83.3

Table 2: Correlation of HADS-A, HADS-D, and WHOQOL-BREF scores

Correlation	HADS-A score	p-valuea	HADS-D score	p-valueb
WHOQOL Domain 1 score	-0.592	0.0001**	-0.486	0.0001**
WHOQOL Domain 2 score	-0.586	0.0001**	-0.646	0.0001**
WHOQOL Domain 3 score	-0.198	0.053	-0.400	0.0001**
WHOQOL Domain 4 score	-0.325	0.001**	-0.307	0.002**

***Significant, Pearson Correlative, aAnxiety, bDepression*

Table 3: Comparison of mean values of WHOQOL-BREF domains among anxiety disorder and those without anxiety disorder

WHOQOL-BREF Domains	Anxiety disorder	No anxiety disorder	p-value
	Mean Score	Mean Score	
WHOQOL Domain 1 Score	43.81	53.20	0.0001*
WHOQOL Domain 2 Score	53.42	62.86	0.0001*
WHOQOL Domain 3 Score	68.08	68.39	0.889
WHOQOL Domain 4 Score	68.12	70.44	0.182

*Significant, Independent sample t-test

Table 4: Comparison of mean values of WHOQOL-BREF domains among depressive disorder and those without depressive disorder

WHOQOL-BREF Domains	Depressive disorder	No depressive disorder	p-value
	Mean	Mean	
WHOQOL Domain 1 Score	43.62	52.63	0.0001*
WHOQOL Domain 2 Score	48.57	63.59	0.0001*
WHOQOL Domain 3 Score	62.00	70.07	0.005*
WHOQOL Domain 4 Score	66.19	70.83	0.012*

*Significant, Independent sample t-test

DISCUSSION

Our finding of a higher proportion of male participants is analogous to the findings of other studies of CAD and psychiatric co-morbidities.[17,8] Being a male gender in itself is an independent risk factor for CAD.[2] The most common CAD diagnosis among the participants was STEMI which is parallel to the findings of Sharma et. al. 2018.[8] We assessed anxiety and depression using the Hospital Anxiety and Depression Scale, a reliable and validated screening and diagnostic tool for identifying these conditions in patients in Nepal. This scale has also been utilized in other comparable studies.[17, 8, 18]

Our finding shows that anxiety and depressive disorders are common in CAD patients and are more prevalent than in the general population in Nepal.[19,20] These findings on the prevalence of depression and anxiety disorders are similar to the studies by Sharma et al., 2018 and Smolderen et al., 2017.[8, 5] Using a HADS cut-off score of ≥11, Sharma et al., found the prevalence rates of anxiety and depression to be 27.4% and 23.8% respectively. The depression rate being slightly higher in this study might be due to other predictors of depression like being illiterate, and a low socioeconomic background found in the study[8] However, the prevalence rate of depression in our study is lower compared to studies by Al Zaru et al., 2020, Korean Depression in acute coronary syndrome (K-DEPACS) study, Yanping et al; 2014, and Murphy et al., 2020.[7,6] Our study excluded CAD patients with comorbidities except for hypertension and

dyslipidemia and the rate of dyslipidemia was low in our study. Many similar studies have found concomitant comorbidities to be an important clinical predictor of anxiety and depression in CAD patients. [4,6,21] A study by Yessennagger et al; 2015 among CAD patients from 2000 to 2013 found depression in 2.9% and anxiety disorder in 1.1% which was significantly lower in comparison to our findings and other literature. [22] Thus, there are variations among the studies on the prevalence rates of anxiety and depressive disorders among CAD patients according to geographical locations, tools used for screening and evaluation and their cut-off values used, and inclusion and exclusion of co-morbidities. [4, 6, 7, 21]

We used ICD-10 DCR to further categorize the anxiety and depressive disorders which many other similar studies have omitted in their methodology. [6,7,8] Our findings reveal that the most common anxiety disorder diagnosis was generalized anxiety disorder (11.5%) followed by panic disorder (8.3%) which is similar to a systematic review and meta-regression by Tully et alin 2014. [23] Likewise, another study from India in 2018 found panic disorder (12.10%) as the most common anxiety disorder in CAD patients followed by agoraphobia (2.40%) which is slightly different from our finding. [9] Our findings suggest that the majority of depressive disorders are mild in severity which is consistent with the finding by Altino et al., 2017 and Yeshun et al 2019 who found that the majority of CAD patients had mild depression. [21, 24] Consistent with the hypothesis that the diagnosis of depression and anxiety are found to be persistent in long-term follow-ups following the diagnosis of CAD, we did not find a statistically significant association of duration of CAD diagnosis on prevalence rates of anxiety and depression. [4,7,9,26]

Our study did not find a statistically significant difference in the prevalence of anxiety and depressive disorder among different age groups. Murphy et al. found that younger age (<55 years) was associated with an increased rate of depression and anxiety while another study found an association of older age (>65 years) with higher rates of depression and anxiety disorders. [4,7] This might be because of a smaller sample size of our study in comparison with other studies.

In our study rates of depression were higher among females (38%) than in males (15%) and there was a statistically significant association between gender and diagnosis of depressive disorder (p=0.012). Our result is comparable with the finding of a meta-analysis done in 2012 which found that women had a greater prevalence of depressive disorder in comparison to men in CAD patients with an odds ratio of 1.77. Likewise, various other studies have found the female gender as an important predictor of depression. [4,5,6,27] So, consistent with the general population the prevalence of depression is two times greater among female CAD patients. [17,27] Our study revealed that, among the quality of life (QoL) domains, the physical domain is most impacted for patients with coronary artery disease (CAD), followed by the psychological and social domains. Our findings highlighted that the quality of life further decreased in the presence of anxiety and depression co-morbidities with depression being the stronger predictor. Depression has been found to have a greater impact on QoL than symptoms related to the severity of the cardiac disease even in patients with stable CAD. [28] K-DEPACS study using WHOQOL-BREF found that baseline QoL was significantly lower in patients with comorbid depressive disorder than those without like in our study. Unlike our findings, a significant difference was found only across the physical domain but not in the social and environmental domains. [14] Thus, our findings were consistent with many other studies which have found that Quality of life is reduced in CAD patients who have co-morbid anxiety and depression which were strong independent predictors of QoL. [13,14, 28,29,30]

Our findings suggest that being male and having the diagnosis of CAD within a year positively impacted the QoL mainly across psychological and environmental domains respectively. Several studies have evaluated other clinical and demographic parameters and their influence on and QoL have found that patients receiving percutaneous coronary intervention reporting better QoL compared with patients receiving conservative management or medical therapy, age inversely related to QoL and female patients with CAD reporting poor QoL compared with male patients. [13, 30]

CONCLUSION

We observed that a significant proportion of patients with CAD suffered from anxiety disorders (27.1%) and depressive disorders (20.9%). The presence of anxiety and depression negatively affected the quality of life in patients with CAD. Observing the above findings, we recommend screening for anxiety and depression in patients with CAD and addressing them as a part of the overall treatment approach to CAD.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

ETHICAL APPROVAL

Ethical approval was taken from the Institute of Medicine, and Institutional review committee (Ref no: 186/(6-11)E2076/077, and informed consent was taken from all the patients for the study.

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LIMITATIONS OF THE STUDY:

As a cross-sectional study, it limits our ability to establish causality, meaning we cannot determine whether CAD and psychiatric comorbidities influence each other or share common underlying factors. Selection bias may have occurred, as cases were drawn from a clinic setting, thereby limiting generalizability. Recall bias could also affect accuracy, especially regarding past clinical history and family history. Additionally, the small sample size reduces the statistical power, making it difficult to draw robust conclusions or detect subtle associations between variables.

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