Prevalence of depression among patients with coronary artery disease and associated factors

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Abstract: Co-morbid depression and coronary artery disease (CAD) is highly prevalent. The aim of present study was to assess the prevalence of depression among patients with CAD and associated factors. This cross sectional study was conducted in southern Iran. During 2013, a total of 100 patients were selected using convenience sampling. Beck depression inventory (BDI) was distributed among patients with CAD. Patients with depression score below 9 were considered as healthy subjects and those with score of 9-18, 19-29, 30-40 and above 40 were characterized as mild, moderate, severe and very severe depression. The mean age of participants was 52.3 ± 10.19. The cumulative depression score of participants was 17.8 ± 9.19. A number of 18 patients did not meet the criterion for depression, while 42%, 38% and 12% suffered from mild, moderate and severe depression, respectively. Depression had significant correlation with lower educational level, lower income, unemployment and patients who lived alone. The prevalence of depression in southern Iran was higher than other regions. Clinical structured interview for accurate diagnosis and suitable treatment is recommended.

Keywords: Prevalence, Depression, Coronary Artery Disease

1. Introduction

Depression is a leading cause of mortality and morbidity among patients with chronic disease (1, 2). Many studies have demonstrated that patients with coronary artery disease (CAD) are at increased risk of depression and ensuing lower quality of life (3, 4). The prevalence of depression among the medical disease is estimated to be between 12 and 66%. In several studies depression and depressive symptoms have reported to be between 17-45% (4, 5).

Many individual and social complications have been reported for comorbid depression and CAD (6, 7). Depression may affect the management results and causes higher hospitalization rates, suicidal attempts, cardiac events and death, social and economic burden for patients and their families, and lower treatment adherence (5, 8-10). Many studies have demonstrated that depressive disorders can be recognized and treated in this population (11).

Treatment of depression in these subjects can decrease its complications and improve the quality of life and even life expectancy of the afflicted patients (12, 13). The objectives of the present study was to determine the prevalence of depression in patients with coronary artery disease and its associated factors.

2. Material and Methods

This cross-sectional study was carried out in Shahid Mohammadi Hospital of Hormozgan University of Medical Sciences in 2013. The study population was consisted of all the patients with CAD.

Totally 100 Patients with CAD who experienced their first heart attack during the 6 months that led to this study and were readmitted to cardiac ward of Shahid Mohammadi Hospital. The samples were selected by convenience sampling. Patient with poor cognitive functions, first cardiac ward admission, verbal, visual and auditory problems, severe disability and inability to speak Persian were excluded.

Persian version of Beck depression inventory, was completed by participants. demographic data of participants such as age, gender, marital status, economic status, educational level, employment status, residential location (urban or rural) were collected. BDI is a 21 item questionnaire that each item rated between 0 and 3 points. And summation of 21 items score, made the total score for each questionnaire. Healthy people were those who got less than 9 points. Those who scored between 9-18 points were considered as mild depression. Those with 19-29, 30-40 and above 40 points were considered to have moderate, severe and very severe

depression. Participants who refused to participate in the study were excluded. Data was analyzed using SPSS 19.0. The associations between ordinal variables and depression was analyzed by Spearman correlation test. Comparison of depression score among two and more than two groups was conducted by Independent sample t-test and ANOVA, respectively. P-value below 0.05 was considered statistically significant.

3. Results

Among the participants, 58 (58%) were female and 42 (42%) were male. The median age of participants was 52.3 ± 10.19 (ranged 37-80). The mean age of male and female patients were 52.2 ± 8.9 and 51.9 ± 10.9, respectively ($P > 0.05$). Among the participants, 22 (22%) were single, 66 (66%) were married, 4 (4%) were separated and 8 (8%) patients were widow/widower. The majority of participants (N= 38, P= 38%) had graduated from high school.

A number of 30 (30%) patients were illiterate and 6 (6%) patients were graduated from primary school and 10 (10%) from secondary school. Among the participants 16 (16%) had college degree.

The majority of participants (N=64, P=64%) were unemployed and 36 (36%) were employed. Sixty eight (68%) and 32 (32%) patients lived in urban and rural counties respectively.

The mean cumulative depression score of all participants was 17.8 ± 9.19. Based on BDI, without considering depression severity, 82 patients (82%) suffered from depression. Eighteen patients (18%) did not meet the criterion for depression. Also, 42 (42%) suffered from mild depression and 38 patients (38%) suffered from moderate depression and the rest 12 patients (12%) were categorized as severe depression.

In table 1, depression scores of participants are demonstrated based on background characteristics.

4. Discussion:

The role of depression in the treatment outcome and its complications are well established in several investigations (14, 15). Also, the comorbid depression and CAD have an adverse effect on the quality of life of affected patients (16, 17). This leads to increased mortality and morbidity of patients with CAD (5, 18, 19).

This study was conducted to assess the prevalence of depression among patients with CAD in Hormozgan province in southern Iran. The results showed that the mean age of participants was about 52 years. In other studies, the mean age of participants were higher than our subjects. (20-22). This shows that in southern Iran patients are at increased risk for CAD in younger age compared with the USA. This could be due to the influence of life style modification

programs which are more conducted in the American population than the Middle east.

Table 1: Depression score of participants based on baseline characteristics

Variables		Mean ± SD	P value
Gender	Male	15.45 ± 7.3	0.005
	Female	19.68 ± 10	
Marital status	Single	15.45±10.6	0.013
	Married	17.36 ± 8.4	
	Separated	21 ± 9.2	
	Widow/ Widower	27.25 ± 5.7	
Educational level	Illiterate	21.73 ± 8.9	< 0.001
	Primary school	18.3 ± 8.4	
	Secondary school	16 ± 7.3	
	High School	19 ± 8.9	
	college	9 ± 5.2	
Employment status	Unemployed	20.28 ± 9.2	< 0.001
	Employed	12.7 ± 6.7	
Residential location	Urban	16.67 ± 7.6	NS*
	Rural	20.43 ± 9.8	
Economic status	Low	22 ± 8.3	<0.001
	Medium	17.79 ± 8.7	
	High	6.6 ± 4.1	

*NS: non significant

In this study the results showed depression was significantly more prevalent in female patients than males. A finding consisted with other studies(21, 23-25).

Also, the results showed, cumulative depression scores in widow/widower patients was higher than separated patients and in separated patients was higher than married patients. Several studies have indicated that married patients are less likely to have depression. This could be due to emotional and economic burden among patients who live alone (12, 26, 27).

The results showed that illiterate patients achieved higher depression score than other patients. Cumulative depression score in patients with academic degree was lower than others. Many authors have indicated that less educated patients suffer more than high educated patients (5, 28, 29).

The results showed that cumulative depression score among unemployed patients and those with lower income was significantly higher than other patients. These findings are well documented in several investigations (28, 30).

In this study we demonstrated that cumulative depression score among rural patients was higher than urban. Although this difference was not statistically significant, many factors can lead to this difference. It could be due to lower family income and

educational level in this population which had significant correlation with depression score.

The results showed that 82 participants (82%) met the criterion for depression. This finding is higher than the previously results reported in other studies (22, 28, 31). This finding can be attributed to several factors. The first, which was also the limitation of our study was that we did not exclude patients with coexistent diseases such as diabetes mellitus, hypertension, renal and peripheral vascular disease and some other medical conditions which are common in the elderly. This can be the most important cause of overestimation of depression among the studied population. The second reason is the study tool was used in this study which is different with other studies. The third factor can be due to the effect of lower educational level and income and higher level of unemployment in Hormozgan Province in comparison with other regions (31, 32).

Also, we assessed the patients with prior coronary artery disease while, in the aforesaid studies patients with prior cardiac disease were excluded from their studies. This could be also, another reason for higher prevalence of depression in our study.

In our study the majority of participants suffered from mild depression, followed by moderate depression. This finding was consistent with the results by Blumenthal and colleagues (22). They reported that mild depression was more prevalent among patients with CAD. Also, other investigators reported that mild to moderate depression estimated to be between 17-30% of cardiac patients and are more prevalent (33, 34). These results are comparable with our findings.

This study was limited by several factors. The most important was that we did not exclude patients with chronic medical disease. Another limitation was that diagnosis of depression was based on BDI and clinical structured interview was not considered for patients for accurate diagnosis of depression. Also, this study was limited by its small sample size in comparison with other studies. Accordingly, future studies should be conducted with considering higher sample size, clinical structured interview and exclusion of patients with chronic medical diseases in order to decline overestimation or underestimation of depression.

In conclusion, in this study we demonstrated that prevalence of depression among patients with CAD in southern Iran was higher than other countries. Also, depression in this patients was associated with the female gender, lower educational levels and family income, and living alone.

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