International Journal of Healthcare Sciences ISSN 2348-5728 (Online)
Vol. 4, Issue 2, pp: (2068-2072), Month: October 2016 - March 2017, Available at: www.researchpublish.com

Depression among Patients with Coronary Artery Disease in Saudi Arabia

[1]Naeem Alshoaibi, [2]Galya G. Alsharif, [3]Jumanah MS. Ardawi, [4]Lama Andijani, [5]Mohammad Alahdal, [6]Mohamed Nabil, Ama, [7]Imad Hameedullah

[1]MD, FRCP(c), FACC, [2,3,4,5,6] MBBS, Department of Medicine, Faculty of Medicine King Abdulaziz University Jeddah, Saudi Arabia

Abstract: **Coronary artery disease (CAD) is a major public health problem worldwide, ranking as the number one cause of death. Many studies found an association between CAD and depression, which is an under diagnosed and undertreated condition.**

Method: We aimed to establish the presence of an association between these two disabilities in King Abdulaziz University hospital, Jeddah, Saudi Arabia. A cross sectional study was conducted on 99 randomly selected patients previously diagnosed with myocardial infarction, were they completed a baseline questionnaire, 2-item Patient Health Questionnaire (PHQ-2), and then 9-item Patient Health Questionnaire (PHQ-9).

Result and conclusion: We diagnosed 39% (39 out of 99) new cases of depression, with deferent stages of severity and concluded that there is in fact an association between these two disorders in our community in spite the cultural differences requiring physicians to actively screen patients with established CAD for depression.

Keywords: **Coronary artery disease (CAD), Patient Health Questionnaire.**

1. INTRODUCTION

It is well known that coronary artery disease (CAD) is a major public health epidemic worldwide, being the number one cause of death [1]. Studies have found that patients with CAD have some degree of depression [2,3], and the depression by itself is a major factor for physical, social and emotional dysfunction, which is usually under diagnosed and undertreated [4,5]. Numerous studies have stated that patients with CAD who develop depression may have a higher risk of developing subsequent cardiac events and higher morbidity and mortality rates [2,6,7]. The aim of this study is to establish the prevalence of depression among CAD patients in King Abdulaziz University Hospital (KAUH), Jeddah, Saudi Arabia and report any social or cultural influences considerable in the management of these patients.

2. METHOD

Design and Recruitment:

This was a cross-sectional study to find the prevalence of depression in our community among patients diagnosed with CAD. Patients with history of myocardial infarction or coronary revascularization were identified for inclusion. We excluded individuals with non-coronary artery diseases, chronic diseases such as autoimmune diseases, malignancies, chronic renal failure, heart failure, chronic liver diseases, and who were on antidepressant medications or steroids. These exclusion criteria minimized the possibility of having depression due to chronicity of their diseases, high prevalence of depression with malignancy, effect of antidepressants on psychiatric wellbeing, and steroids due to their effect on mood and behavior. 99 participants in our outpatient clinics completed the baseline questionnaire. The study was approved by

the KAUH Institutional Review Board and Department of Medicine. All participants were volunteers and consented to the study prior to completing questionnaire.

Baseline Information:

Gender, age, past medical history, medications, cardiovascular risk factors, cardiac intervention and date of intervention were included in the questionnaire filled by participants with the aid of trained data collectors.

Depression Evaluation:

All participants were screened by data collectors with a yes/no version of the 2-item Patient Health Questionnaire (PHQ-2). Patients who answered yes to either of the questions or both were subsequently screened with a validated Arabic translated version of the multiple choice 9-item Patient Health Questionnaire (PHQ-9) with a maximal score of 27. A score of zero consisted of no depression. Positive depression screen was defined as a score of 1 or above with varying degrees of severity in the PHQ-9. Scores ranged from 1-9 were classified as minimal to mild depression. Scores ranged 10-27 were assorted as moderate to severe depression. Participants who scored above 1 were referred for further psychiatric evaluation and possible treatment.

Statistics:

Ordinary Least Squares (OLS) method was applied to investigate the effect of these independent variables on the severity of depression. The software used was Stata/SE version 11.2. The significance threshold was set at P value of < 0.05.

3. RESULTS

Ninety-nine subjects known to have CAD were screened. The mean age of participants was 58 years (12.1 STD). We found 64.6 % of the patients were male, hypertension was established in 72.7%, diabetes mellitus 57.6 %, dyslipidemia 53.3%, inactive lifestyle 50.5%, unhealthy diet 46.5%, family history of CAD 41.4%, smoking 36.4%, and obesity was observed in 34.3%. We identified 38 (39%) patients with depression that were never diagnosed before, 64% of them were males. Depression severity classification showed 6% had minimal depression, 14% mild depression, 10% moderate depression, 6% moderate to severe depression, and 3% had severe depression.

In this study, we identified near death experience, , general health, new medication use, frequent hospital visits, and family stress have some roles in the development of depression in patients with CAD. We found life expectancy, drugs costs, economics and social class were the most significant factors, with P values of .04, .005, and .001 respectively.

4. DISCUSSION

Our study found 39% of patients had undiagnosed depression with varying severity. Albeit severity categorization had limited strength due to power of study, we further evaluated the most significant factors which contributed to the development of depression in our CAD patients.

Many studies have found that depression was associated with worse prognosis in patients with established CAD [8-10], causative for higher mortality rates in these patients [11,12]. As depression increases in severity, there is also an increase in likelihood of earlier cardiac events [8]. Moreover, presence of depression reduced the patient's ability to modify their cardiovascular risk factors, which contributed to worse prognosis whether directly or indirectly [8,12,13]. Patients who developed depression following acute myocardial infarction (MI) have decreased adherence to secondary preventive behaviors such as smoking cessation, physical activity, and cardiac rehabilitation [11]. Patients non-compliant to smoking cessation, poor medication adherence, and poor glycemic control in diabetes may affect the patient's overall prognosis [10,12]. A study reported medication non-adherence may be caused by depression itself, and once treatment for depression has begun, patients may become more compliant to their medications and potentially improve their overall health outcome [13]. Depression severity in CAD is not well reported however, evidence suggested that even with control of cardiovascular risk factors, depression alone demonstrated risk of developing ischemic heart disease [9]. Nevertheless, depression following CAD had adverse effects on the patient's quality of life and their adherence to therapy, thus increasing mortality rate [14]. Another study described affect of depression symptoms on functionality of

coronary arteries rather than the number of diseased coronary arteries, therefore depression may lead to worsening heart function [9]. Other studies have described physiological action of depression effecting heart rate variability (HRV), which is the beat-to-beat alteration controlled by the autonomic nervous system [12]. Autonomic dysfunction caused by depression will decrease the parasympathetic cardiac control during stressors leading to a decrease in the HRV [10,13]. Increased autonomic tone may lead to decreased vagal tone and hence, reduced HRV predisposes the heart to the development of fibrillations [9] that is known to increase risk of sudden death [10]. Another study specified patients diagnosed with depression previous to CAD are prone to develop congestive heart failure (CHF) and concluded that depressed patients had a higher rate of developing cardiac complications, re-infarction, recurrent ischemia, CHF, and arrhythmias compared to non-depressed patients [12]. We suspect patients with established CAD and diagnosed depression had decreased life expectancy, regardless of depression severity. Occurrence of death during 18 to 24 month interval post-MI is associative between depression following CAD and sudden cardiac death [13]. One study found depression to be a significant mortality predictor in survival rate 6 months post-MI [15]. Another study reported patients with established CAD and diagnosed depression had increased risk of mortality during the first 6 months, and patients who only presented with depressive symptoms had a higher mortality rate during 18 months following an MI [12,14].

Gender

Studies showed that depression is higher in females with an increase in mortality rate regardless of the presence of CAD, which could be linked to having more severe symptoms [9,16]. One study reported depressive symptoms are 29% in females and 18% in males [16]. Albeit, in our study we found depression to be higher among males rather than females (64.1% in males and 35.9% in females), nevertheless this could be considered as a limitation due to low sample size of 35 females and 64 males. There is similar evidence of males with depression and symptom of 'hopelessness' who had a higher mortality rate due to developing carotid atherosclerosis [17].

Hospital Visits and Cost

Studies found that hospital admission was in fact more frequent in patients with diagnosed depression after establishing CAD [11,14]. Similarly, depression had an unfavorable effect on CAD leading to increased readmission rates [18], by having more outpatient appointments either to an internist, family physician, or a cardiologist [19]. These patients also had more emergency department visits compared to patients without depression [19]. Increased cost was reported due to these frequent admissions, visits, and cardiac rehabilitation programs [19].

Socioeconomics

Socioeconomics is an interaction of social and economic factors. A study described low socioeconomic status as a common factor towards developing depression and poorer prognosis in patients with established CAD [17]. This agrees with our findings in indicating that depression severity increases with low social-economic status, (P.001). It has been remarked that low socioeconomic status will affect patient's adherence towards the therapeutic requirements of depression, CAD, or any other medical illness leading to worsened health condition [20].

Coronary Artery Bypass Grafting (CABG)

Our study highlighted the coexistence of depression in CAD patients. Meanwhile, some of the participants underwent CABG procedure as their last resort treatment for CAD, it is important to note the significance of depression in these patients. Literature has suggested an overall improvement of depressive symptoms after CABG, yet significant persistent depression prevails, thus recommending depression screening and close monitoring of these patients [21-22]. A study on mortality rates in post-CABG patients showed depression following CABG predicted poorer clinical outcomes [22]. Patients with diagnosed depression prior to CABG had higher rates of hospital readmission and higher risk of developing life-threatening cardiac events, thus acting as an independent factor for mortality and suggestive that non-depressed patients could have better mortality outcomes [10]. Although we did not explore mortality rates of patients post-CABG with diagnosed depression, our study found 18 participants had CABG, yet only 5 developed various degrees of depression. Statistically, 12.8% of our total 39 depressed patients had undergone CABG.

5. CONCLUSION

There is no doubt depression in patients with CAD in Saudi Arabia is highly prevalent despite the cultural differences and social support, whether unidirectional or bidirectional, direct or indirect, the lack of detecting and screening for depression is visible. The evidence described in our study raises association between depression and CAD, and we recommend physicians dealing with these patients to increase screening efforts. While it is not known if treating depression would affect the prognosis and mortality of CAD patients, our study suggests screening for depression and appropriate referral may improve outcomes.

REFERENCES

[1] Cardiovascular diseases (CVDs) [Internet]. World Health Organization. 2016 [cited 18 June 2016]. Available from: http://www.who.int/mediacentre/factsheets/fs317/en/

[2] Frasure-Smith N, Lespérance F. Depression and coronary artery disease. Herz. 2006 Dec;31 Suppl 3 64-68. PMID: 17575807.

[3] Carney R, Rich M, Tevelde A, Saini J, Clark K, Jaffe A. Major depressive disorder in coronary artery disease. The American Journal of Cardiology. 1987;60(16):1273-1275.

[4] O'ConnorCM, Gurbel PA, Serebruany VL. Depression and ischemic heart disease. Am Heart J. 2000;140:63–69.

[5] RickenbacherP, Pfisterer M. TIME has come to have a closer look at the management of cardiovascular disease in the elderly. Eur Heart J. 2002;23:993–995

[6] Lett HS1, Blumenthal JA, Babyak MA, Sherwood A, Strauman T, Robins C, et al. Depression as a risk factor for coronary artery disease: evidence, mechanisms, and treatment. Psychosom Med. 2004 May-Jun;66(3):305-15

[7] Barefoot JC, Helms MJ, Mark DB, Bulmenthal JA, Califf RM, Haney TL, et al. Depression and Long-Term Mortality Risk in Patients With Coronary Artery Disease. Am J of cardiology. 1996 sep 15;78(6)613-617

[8] Lichtman J, Bigger J, Blumenthal J, Frasure-Smith N, Kaufmann P, Lesperance F et al. Depression and Coronary Heart Disease: Recommendations for Screening, Referral, and Treatment: A Science Advisory From the American Heart Association Prevention Committee of the Council on Cardiovascular Nursing, Council on Clinical Cardiology, Council on Epidemiology and Prevention, and Interdisciplinary Council on Quality of Care and Outcomes Research: Endorsed by the American Psychiatric Association. Circulation. 2008;118(17):1768-1775.

[9] Manica A, Leães C, Frey B, Juruena M. The role of depression in coronary artery disease. Arq Bras Cardiol. 1999;73(2):237-250.

[10] Zellweger M, Osterwalder R, Langewitz W, Pfisterer M. Coronary artery disease and depression. European Heart Journal. 2004;25(1):3-9.

[11] Huffman J, Celano C, Beach S, Motiwala S, Januzzi J. Depression and Cardiac Disease: Epidemiology, Mechanisms, and Diagnosis. Cardiovascular Psychiatry and Neurology. 2013;2013:1-14.

[12] Khawaja IS, Westermeyer JJ, Gajwani P, Feinstein RE. Depression and Coronary Artery Disease: The Association, Mechanisms, and Therapeutic Implications. Psychiatry (Edgmont). 2009;6(1):38-51.

[13] Empana J, Jouven X, Lemaitre R, Sotoodehnia N, Rea T, Raghunathan T et al. Clinical Depression and Risk of Out-of-Hospital Cardiac Arrest. Archives of Internal Medicine. 2006;166(2):195.

[14] Januzzi J, Stern T, Pasternak R, DeSanctis R. The Influence of Anxiety and Depression on Outcomes of Patients With Coronary Artery Disease. Archives of Internal Medicine. 2000;160(13):1913.

[15] Frasure-Smith N, Lespérance F, Talajic M. Depression Following Myocardial Infarction: Impact on 6-Month Survival.JAMA. 1993;270(15):1819-1825.

[16] Parashar S, Rumsfeld J, Reid K, Buchanan D, Dawood N, Khizer S et al. Impact of Depression on Sex Differences in Outcome After Myocardial Infarction. Circulation: Cardiovascular Quality and Outcomes. 2009;2(1):33-40.

[17] Rozanski A, Blumenthal J, Kaplan J. Impact of Psychological Factors on the Pathogenesis of Cardiovascular Disease and Implications for Therapy. Circulation. 1999;99(16):2192-2217.

[18] Baumeister H, Haschke A, Munzinger M, Hutter N, Tully P. Inpatient and outpatient costs in patients with coronary artery disease and mental disorders: a systematic review. BioPsychoSocial Med. 2015;9(1).

[19] Baumeister H, Haschke A, Munzinger M, Hutter N, Tully P. Inpatient and outpatient costs in patients with coronary artery disease and mental disorders: a systematic review. BioPsychoSocial Med. 2015;9(1).

[20] Rozanski A, Blumenthal J, Davidson K, Saab P, Kubzansky L. The epidemiology, pathophysiology, and management of psychosocial risk factors in cardiac practice. Journal of the American College of Cardiology. 2005;45(5):637-651.

[21] Ravven S, Bader C, Azar A, Rudolph J. Depressive Symptoms After CABG Surgery. Harvard Review of Psychiatry. 2013;21(2):59-69.

[22] Nguyen D, Duca N, Belnap B, Abede K, Anderson A, Reynolds C et al. Depression Following Coronary Artery Bypass Graft Surgery Predicts Increased 10-Year All-Cause Mortality. Journal of the American College of Cardiology. 2016;67(13):2102