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REVIEW CARDIOLOGY

The relationship between coronary artery disease and depression and anxiety scores

Lutfu Askin, Kader Eliz Uzel, Okan Tanrıverdi, Veysi Kavalcı, Ozkan Yavcin, Serdar Turkmen

Department of Cardiology, Adiyaman Training and Research Hospital, Adiyaman, Turkey

ABSTRACT

Coronary artery disease (CAD) is one of the severe diseases that may cause significant moral and financial burden on society today. There are many studies in the literature on whether psychiatric disorders may cause CAD or an increase in prevalence after CAD. Although many studies have emphasized the importance of early diagnosis and treatment of depression in CAD patients, clinicians do not attach much attention to depression in daily practice. Several scales have been developed that are comfortable to use to describe anxiety and depression in CAD patients. High depression and anxiety scores predicted by psychological symptom scales following CAD treatment are closely related to treatment success and prognosis of the CAD. We believe that patients with CAD should be followed carefully for the diagnosis of depression and anxiety disorders; since the treatment of them may improve the prognosis of CAD.

Keywords: Coronary artery disease; depression and anxiety scores; psychiatric disorders.

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Coronary artery disease (CAD) is still an important cause of morbidity and mortality despite advanced medical and interventional therapies. Depression and anxiety disorders are frequently associated with CAD and with the adverse events in these patients [1, 2]. Major depressive diseases have been proven to increase the risk of both cardiovascular disease and cardiac death. [3]. The prevalence of major depressive disorders in patients with CAD is too frequent to be underestimated. In a study, a 20% to 30% prevalence of the major depressive disease in individuals with CAD was reported [4]. The effects of long-term exposure of the cardiovascular system to the endocrine and autonomic dysregulations are possible underlying mechanisms that may explain the relationship between major depressive disease and CAD [5]. In addition, chronic inflammation is thought to affect the etiopathogenetic process of depression and atherosclerosis [6, 7].

Our main aim is to emphasize the importance of diagnosis and treatment of psychiatric disorders in CAD patients and to inform about the practical use of depression and anxiety scores in CAD patients.

Prevalence of Depression in CAD

Previous studies have reported that the prevalence of depression increases twice as often with CAD [8]. A Chinese meta-analysis showed that the prevalence of depression in hospitalized patients with CAD was 51% and was higher than that of patients with CAD in the community (34.6% to 45%) [4]. Another study in Australia showed that anxiety symptoms became more common with CAD [9]. In the study conducted by Lu et al. [10], 40.82% of the patients with depression and 25.12% of patients with anxiety were identified during hospital-

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Correspondence: Lutfu ASKIN, MD. Adiyaman Egitim ve Arastirma Hastanesi, Kardiyoloji Klinigi, Adiyaman, Turkey.
Tel: +90 416 216 10 15 e-mail: lutfuaskin23@gmail.com

ization. In general, the depression rate was higher than anxiety, and our findings were similar to previous studies. In light of these results, it can be concluded that the Chinese version of the Zung Self-Rating Depression Scale (SDS) and the Zung Self-Rating Anxiety Scale (SAS) may well describe depression and anxiety.

Association of Depression and Outcome in CAD

Previous studies have demonstrated that psychological distress leads to increased atherosclerosis and cardiovascular mortality [2, 11]. Several mechanisms have been proposed to explain the causality between depressive disease and cardiovascular disease. Activation of the sympathetic nervous system during periods of depression and anxiety has a significant role in the autonomic regulation of the cardiovascular system. Vagal tonus fluctuations may lead to impaired heart rate variability and blood pressure balance and loss of baroreceptor reflex function [12, 13].

Psychological disorders, such as depression and anxiety, are underestimated because of the focus on coronary events in patients with CAD and are not known enough [11, 14]. In addition, psychological disorders predispose to cardiovascular diseases in healthy individuals and determine prognosis in patients with existing cardiovascular disease [14, 15]. A previous communication-based cohort study showed that depression predicted a significant increase in myocardial infarction and all-cause mortality [16]. Depression is also known to predict survival after myocardial infarction [3, 14] and in patients with chronic heart failure [14, 17]. Anxiety, which shares similar pathophysiological characteristics with depression, is independently associated with increased mortality in patients with CAD, and its coexistence with depression affects prognosis worse [18].

Increasing evidence suggests that psychological factors may adversely affect the outcome of CAD. Diagnosis and treatment of some comorbid psychiatric disorders during the ACS treatment period are also important [19, 20]. In a previous study, during the eight to 13 months follow-up period after revascularization for ACS, 90.6% of the patients had signs of depression, of which 35.8% had major depression [21].

The use of antidepressant therapy and psychological support in addition to coronary therapy in depression patients with acute MI has been shown to reduce subsequent cardiovascular morbidity and mortality [20].

Evaluation of Depression and Scores for CAD Patients

Although many studies have emphasized the importance of early diagnosis and treatment of depression in CAD patients, [11] clinicians do not attach much attention to depression in daily practice [22]. Several scales have been developed that are practical to use to describe anxiety and depression [23]. Hospital Anxiety and Depression Scale (HADS) has been shown to be useful as a first step screening scale to determine the level of psychological problems in CAD patients [23].

Tesio et al. [22] showed that the 14 cut-off value of the HADS score could be a useful first-step screening tool for depression in patients with CAD. Aydemir et al. [24] have proved the validity and reliability of this scale using the Turkish version of the HADS scale. Ekici et al. [25] showed a positive correlation between the Gensini score and HADS score in patients with CAD. Durmaz et al. [26] demonstrated that depression and anxiety scores were higher in patients with coronary slow flow than in patients with normal coronary arteries. Yalvac et al. [27] found that coronary slow flow patients were prone to depression and anxiety in a population of 450 patients.

Moryś et al. [28] indicated that the HADS scale could underestimate depression symptoms in patients with CAD; However, they concluded that the results of HADS scales were similar to those determined by other scales. Depression scores can be made more valuable using another scale, and results may vary [28].

The HADS score is an easy-to-use practical test that allows patients to evaluate even in intensive daily practice. Gurbuz et al. [29] recommended scoring for depression in patients with coronary artery ectasia (CAE) and recommended psychiatric consultation for patients with high scores. In patients with CAE, as in CAD, depressive symptoms should be checked up carefully without underestimating.

Tamam et al. [30] have hypothesized that people with suspected CAD and who underwent myocardial perfusion scintigraphy may experience severe distress because they are concerned that they may experience life-threatening events and concerned about the procedure during waiting. They used the HADS and the State Continuous Anxiety Inventory (STAI) scores to evaluate some psychological characteristics of patients at risk for heart disease before myocardial perfusion scintigraphy.

Vural et al. [31] also conducted another study, and they assumed that psychological factors were an important parameter affecting prognosis in patients with the acute coronary syndrome (ACS) and were closely related to other clinical parameters. They tried to evaluate some psychological characteristics of patients using ACS treatment using Hamilton depression (HAMD), Hamilton

anxiety (HAMA) and Hamilton panic agoraphobia (HAMPA) scales. They then compared the results of these symptom scales with coronary risk factors, demographic and clinical characteristics of the patients.

Vural et al. [32] searched for associations between coronary artery disease and symptoms of depression and anxiety using Beck depression and anxiety inventories. After controlling for sex and confounding variables, depression score was significantly associated with coronary artery disease, while no association was found for anxiety score. Chest pain was the chief symptom taken into account for guiding decisions for coronary angiography in the study [32]. However, chest pain may also be a symptom of several psychiatric disorders, such as, panic disorder, depression, hypochondriasis, somatization disorder, and generalized anxiety disorder [33, 34]. Vural et al. pointed to the importance of diagnosis, treatment, and follow-up of depression and anxiety disorder to prevent unnecessary diagnostic cardiac catheterization, long before these conditions result in CAD [35].

Underlying Mechanisms of Depression Affecting the Cardiovascular System

Functional changes in the hypothalamic-pituitary-adrenal-cortical axis and activation of the renin-angiotensin-aldosterone system may induce endothelial dysfunction and cardiac arrhythmias by increasing secretion of proinflammatory mediators, catecholamines, and steroid hormones [36]. In addition, depressive disorders may trigger platelet activation by releasing chemokine, such as platelet factor 4 and b-thrombomodulin, leading to coronary artery thrombosis [37, 38]. Several large-scale studies have demonstrated a consistent relationship between anxiety and cardiovascular death [2, 39]. We think it would be a rational approach by clinicians to neglect the presence of depression and anxiety in individuals with CAD.

Subgroups

In their study, female patients had higher depression, anxiety, and panic agoraphobia scores. Similarly, many studies have shown that women have higher levels of depression and anxiety in their daily lives or following ACS [31]; however, these levels were found to be higher in their study compared to other studies. Since there is a greater relationship between depression and high coronary risk in women after ACS, the findings of Vural et al. are very important [31].

Depression and anxiety scores in patients undergoing CABG were surprisingly low, possibly due to the surgical procedure itself that may positively affect patients' psychological status [31]. In prospective studies of CABG patients, Boudrez et al. [40] showed that patients had significant well-being in their psychological status in the first year, especially during the first six months after CABG. According to their findings, patients lived less anxious, less depressed, more alive and happy. The psychological status of the patients who had been treated for ACS was also evaluated at 6 to15 months after PCI or CABG. Lower depression and anxiety scores in patients undergoing CABG may be associated with improved life expectancy and decreased restenosis rate in the postoperative period [31].

Conclusion

High depression and anxiety scores predicted by psychological symptom scales following CAD treatment are closely related to treatment success and prognosis of the disease. Depression and anxiety disorders are common in patients with CAD, and this causality is questioned between psychological and physiological factors. We believe that patients with CAD should be followed carefully for the diagnosis of depression and anxiety disorder; since the psychiatric treatment may improve the prognosis of CAD. Interestingly, significantly lower depression and anxiety scores were observed in patients undergoing CABG after ACS treatment. In our opinion, these data should be evaluated in larger studies.

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