Predictive Factors of Anxiety and Depression in Patients with Acute Coronary Syndrome

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ABSTRACT
OBJECTIVE: To identify the predictive factors of anxiety and depression in patients with acute coronary syndrome.
METHODS: Cross-sectional and retrospective study conducted with 120 patients hospitalized with acute coronary syndrome. Factors interfering with anxiety and depression were assessed.
RESULTS: Anxiety was related to sex, stress, years of education, and depression, while depression was related to sex, diabetes mellitus, obesity, years of education, and trait-anxiety.
CONCLUSIONS: Obesity and anxiety were considered predictive factors for depression, while depression and fewer years of education were considered predictive factors for anxiety.

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INTRODUCTION
Cardiovascular diseases (CVD) together with cerebrovascular diseases are among the main causes of morbidity and mortality in Brazil and worldwide. According to the American Heart Association (AHA), in order to reduce deaths caused by CVD by 20% by 2020, secondary prevention by treating and managing health behaviors and risk factors such as systemic arterial hypertension (SAH), diabetes mellitus (DM), dyslipidemia (DLP), depression and anxiety, in addition to treating acute cardiovascular events, is necessary (Mozaffarian et al., 2016).

Anxiety and depressive disorders are considered the primary causes of emotional distress and decreased quality of life (Bjelland et al., 2008). According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), depressive disorders are characterized by sad or irritable moods, difficulty concentrating due to concerns or fears that something terrible may happen, and a sense of loss of control over oneself (Arlington, 2013).

Studies have shown an association between depression and anxiety in patients with acute coronary syndrome (ACS) (Annagür et al., 2015; Huffman, Celano, & Januzzi, 2010). Depressive symptoms are presented by 15% to 45% of patients after an acute myocardial infarction (AMI), while anxiety affects from 20% to 50% (Annagür et al., 2015; Huffman et al., 2010). Even though these psychiatric disorders are frequent, they are seldom recognized and may persist for months or years, substantially impacting the quality of life of patients (Huffman et al., 2010).

The presence of these psychological conditions is a significant predictor of a worse prognosis and increased mortality among patients with ACS (Annagür et al., 2015; Lichtman et al., 2014; Roest, Heideveld, Martens, de Jonge, & Denollet, 2014; Meijer et al., 2011; Roest, Zuidersma, & de Jonge, 2012; Wu & Kling, 2016). A worse prognosis may be related to physiopathological and/or behavioral factors. Physiopathological mechanisms include increased risk of ventricular arrhythmias, reduced heart rate variability, increased inflammatory markers (e.g., tumor necrosis factor, interleukin 1 and 6, and C-reactive protein), deregulation of hypothalamic-pituitary-adrenal axis (HPA) functions, hyperactivity of the sympathetic nervous system, with elevated peripheral catecholamine levels leading to peripheral vasoconstriction and increased blood pressure, endothelial function and platelet activity (Huffman et al., 2010; Lichtman et al., 2014; Padhya, Sarkar, Davulia, & Malhotra, 2015; Roest et al., 2012; Roest et al., 2014; Wu & Kling, 2016).

Behavioral factors include poor adherence to lifestyle modifications, cardiac rehabilitation programs, and a pharmacological regimen. Patients with depression and anxiety symptoms tend less frequently to follow a low-fat and low-cholesterol diet, exercise, avoid stress, and stop smoking (Huffman et al., 2010; Padhya et al., 2015; Roest et al., 2012; Roest et al., 2014; Wu & Kling, 2016).

At the same time, some studies report that depression (Emdin et al., 2016; Padhya et al., 2015) and anxiety (Emdin et al., 2016; Glozier et al., 2013; Roest et al., 2012) are risk factors for the development of heart diseases and ASC. These studies suggest that both conditions are as...
important in the development of CVD as other risk factors, such as smoking or DM, for instance (Annagür et al., 2015; Huffman et al., 2010; Lichtman et al., 2014).

Considering this context, the identification of factors interfering with anxiety and depression among patients with ASC is important to promoting appropriate interventions.

Therefore, this study’s objective was to identify predictive factors for anxiety and depression among patients with ASC.

METHOD

DESIGN AND PARTICIPANTS

This cross-sectional and retrospective study was conducted with a population sample of 120 patients with ASC who had been hospitalized in the Coronary Unit of the Heart Institute in the Hospital das Clínicas, Medical School, University of São Paulo, from June to October 2012. Data were collected from a previous study’s database (Lopes, Barbosa, Nogueira-Martins, & Barros, 2015).

Inclusion criteria were patients classified as Killip class 1; literate; with at least four years of education; and younger than 75 years old. Exclusion criteria were situations that could influence the presence of depression in patients (e.g., arrhythmias, ischemic pain, invasive procedures on the day of data collection or the use of anxiolytics or antidepressants) and/or situations that prevented patients from filling out the questionnaires (e.g., impaired consciousness levels and/or visual impairment).

ETHICAL ASPECTS

Prior to data collection, the study was approved by the Institutional Review Boards (CAPPesq) at the Hospital das Clínicas and at the Medical School, University of São Paulo under No. 0209/10 and at the São Paulo Review Boards (CAPPesq) at the Hospital das Clinicas and at the Medical School, University of São Paulo (UNIFESP/EPM) under No. CEP 0638/2015.

MEASURES

PSYCHIATRIC SYMPTOMS

Depressive symptoms were assessed using the Beck Depression Inventory, a scale composed of 21 items, developed by Beck and collaborators (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) validated in Brazil by Gorenstein and collaborators (Gorenstein & Andrade, 1996). The scale’s items are scored from 0 to 3, with an ascending order of severity. The total score ranges from 0 to 63, which results from summing up all the items’ scores (Beck et al., 1961; Gorenstein & Andrade, 1996). The categorization used in this study (Lopes et al., 2015) was: absence of depression symptoms/mild depression (0–19 points) and moderate/severe depression (20–63 points).

Anxiety symptoms were assessed using the Anxiety-Trait Inventory (Spielberger, Gorsuch, & Lushene, 1970). This self-report scale was also validated in Brazil (Biaggio, 1980) and consists of 20 statements on a four-point scale (Altemus, 2006; Beck et al., 1961) distributed in such a way to avoid answer bias. The total score ranges from 20 to 80 points (Spielberger et al., 1970). The categorization used for this study was: mild/moderate anxiety (20–49 points) and severe/very severe anxiety (50–80 points) (Lopes et al., 2015).

GENERAL CHARACTERISTICS

The variables used to verify predictive factors for anxiety and depression were (Pérez-Piñar et al., 2016): age, sex, years of education, previous hospitalization, and cardiovascular risk factors (SAH, stress, obesity, sedentariness, DLP, family history of cardiovascular diseases, smoking and alcohol consumption), obtained through the patients’ reports and medical files.

DATA ANALYSIS

Continuous variables were expressed in mean and standard deviation or median and interquartile intervals. Classificatory variables were presented in contingency tables with absolute (n) and relative frequencies (%). The statistical tests used to compare variables were: Chi-square, Fisher’s Exact test, Likelihood Ratio, Mann-Whitney, and Student’s t-test. Antecedent variables that presented p < 0.10 in the univariate analysis were used in the fitting of the logistic regression model; a p-value < 0.05 was considered statistically significant.

RESULTS

GENERAL CHARACTERISTICS

A total of 120 patients were included in this study, 82 (68.4%) of which were men, aged from 29 to 75, with a mean and standard deviation 61 ± 10 years old.

Analysis of cardiovascular risk factors showed a higher prevalence of SAH (n = 88;73.3%), followed by family history (n = 78;65%), sedentariness (n = 70;58.3%), stress (n = 69;57.5%), DLP (n = 68;56.7%), DM (n = 42;35%), smoking (n = 25;20.8%), obesity (n = 24;20%), and daily consumption of alcohol (n = 4;3.3%).

PSYCHIATRIC SYMPTOMS

In regard to the presence of depressive symptoms, 95 (79.17%) patients presented no sign of depression or presented mild symptoms, while 25 (20.83%) presented moderate to severe depression. In regard to trait-anxiety, 99 (82.5%) patients presented mild to moderate anxiety and 21 (17.5%) presented severe to very severe anxiety.

Analysis of the relationship between anxiety and depression with antecedent variables revealed that sex, DM, stress, anxiety, obesity, and number of years of education were related to depression, while sex, stress, depression and number of years of education were related to anxiety (Table 1).

Table 1 shows that female, diabetic, stressed, obese individuals with fewer years of education and also with a higher level of anxiety scored higher on the scale measuring depression. Female, stressed individuals, with fewer years of education and a larger number of depressive symptoms scored higher in the trait-anxiety inventory.

The logistic regression model shows that obesity increases the likelihood of depression by 4.5 times and, for each unit increased in the anxiety score, the likelihood of a patient presenting depression increased by 1.2 times (Table 2). Depression, in turn, increases by 7.9 times one’s likelihood of experiencing anxiety, while one extra year of education is a protective factor from anxiety (Table 3).

DISCUSSION

In regard to cardiovascular risk factors, the most prevalent in this study were SAH, family history of CVD, sedentariness, stress and DLP. These same factors were also identified in other studies (Glozier et al., 2013; Mozaffarian et al., 2016). In regard to depression and anxiety levels, most patients presented mild symptoms of depression and anxiety, results that are similar to another study (Gustad, Laugsand, Janszky, Dalen, & Bjerketet, 2014).

The variables related to anxiety are being a woman, experiencing stress, depression and having fewer years of education, while depression and years of education were predictive factors. Depression appeared to be related to being a woman, having DM, stress, obesity and fewer years of education, while obesity and anxiety were predictive factors.

Anxiety and depression are often considered separate psychopathological conditions, but they share common symptoms, which often overlap (Gustad et al., 2014; Roest et al., 2014). The mechanisms that
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