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Correlation between depression and stress test at patients with ischemic heart

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Abstract. Depression and coronary heart disease associated could be linked or more ways. There is epidemiological evidence proving that higher levels of depressive clinical symptoms in patients either male or female, is associated with increased risk of stroke and year increased mortality due to coronary events in a row. Meanwhile it has been reported by patients who develop various studies that myocardial infarction depression after heart complications have angry. Some studies have enteritis occurrence of assumptions about the connection between anxiety and ischemic heart disease.
Exercise testing involves cardiovascular overload assessing conditions. The purpose of the diagnosis of diseases in clinical examinations and laboratory hidden, performed at rest, or in assessing functional capacity of the patient. We conducted a prospective study of 206 patients on the correlation of depression and stress testing in patients with ischemic heart disease.
Patients with ischemic heart disease show high levels of anxiety. Anxiety as a state gradually decreases in the first 6 months of treatment early detection of patients with high levels of trait anxiety of can have great practical implications by using methods specific to anxiety and low would improve the evolution of patients with ischemic heart disease.
Anxiety and depression have the ensuing consequences of coping mechanisms used in the process of adapting to acute or chronic stress to person.
Key words: *depression, anxiety, exercise testing, ischemic heart disease, quality of life.*

Introduction

Ischemic heart disease is regarded as the main cause of death for both men and women. Among the causes influencing the aims is that psychosocial factors are involved both in the etiology, progression and prognosis of these events. Recent research suggests that depression is an important indicator to death in psychosocial evolution (1). Depression is associated with an increased risk of developing ischemic heart disease and increase mortality from acute coronary events even in patients with minor depression defending an increased risk of myocardial infarction production and increased mortality after myocardial.
The prevalence of depression in patients with coronary artery disease is between 19%-47% compared to 4% -7% in the general population (2). Patients who have a help diagnose major depressive disorder are 3.9 times more likely to die from cardiac causes compared with those without depressive. A recent meta-analysis of studies from the literature concluded that depression is an independent risk factor coronary artery disease with a hazard ratio of 1.64 totals (3,4).
Depressive disorder is a complex entity characterized by two groups of symptoms, somatic-affective and cognitive disorders. Somatic symptoms, affective-type asthenia, fatigue are often interpreted in the context of cardiovascular pathology accompanying depressive disorder is frequently under diagnosed. Cognitive-affective symptoms, sadness, dissatisfaction, has a higher specificity for the diagnosis of depression, but it is associated while the medium and long term, with an adverse cardiovascular prognosis.
Depressed people tend to have higher levels of inflammation even when their bodies fight infection. Evolution and genetics combined symptoms of depression with psychological responses such as fever, fatigue, inactivity, isolation and anorexia, to limit and reduce mortality caused by infections. The reason why stress is a risk factor for depression is explained by the link between stress and depression seen as a product of a process that alerts the immune system in anticipation of health problems.

Psychiatric adaptation in ischemic heart disease may have a role in the evolution of patients. Hereby ischemic heart disease, evolution and consequences they produce discomfort physically, mentally and socially becoming a source of stress.
Physical discomfort is caused by this specific signs of symptoms of ischemic heart disease with derangement and producing an important evolutionary biological stress but also mentally.
Social and psychological discomfort due to individual assessment of the impact that it has on the lives of ischemic heart disease due to the emergence of a predominate mental stress.
Patients say they side more stress in their lives, have a greater number of cardiovascular symptoms and requires a larger number of hospitalizations.
Exercise test has two components, the method of causing stress and method of highlighting and evaluating the effects on the cardiovascular system.
ECG stress test is the result of a combination of the "physiological" way challenge of strenuous - exercise and most accessible method for detecting the effect of exercise on heart - electrocardiogram. An ECG stress test involves performing a standardized exercise, gradually ascending under derangement monitoring of ECG, blood arterial and sometimes other parameters such as blood oxygen saturation, etc.
Mainly takes place in two ways, the cyclo-ergometer and the treadmill (5,6). The last has the advantage of simplicity can be used by almost all patients, including those obese. The duration of an exercise test is, according to current protocols, 9-15 minutes, rarely more. This is because it is considered that to threshold of 85-90% of the calculated maximum individual patient has a normal functional capacity, and if this threshold does not appear to ECG changes suggestive or symptoms that limit the effort ruled out in principle a hemodynamic ally significant cardiovascular disease (7).
Exercise testing stops to develop symptoms (chest pain, dizziness, shortness of breath), the lowering or raising excessive blood pressure or heart rate, the appearance of heart rhythm disorders, the appearance of ECG changes suggestive of myocardial ischemia or achievement target heart rate which, most often, is the maximum frequency (equal to 220 - age in years). At least, 85-90% of that in the absence of other criteria, exercise testing for detection of myocardial ischemia is inconclusive (8).

Material and method

We conducted a prospective study of 206 patients with ischemic heart disease. They were followed for 48 months. All patients underwent history, clinical examination to identify symptoms and signs of ischemic heart disease, hospitalization, at discharge, 6 months and annually.
Exams when patients were asked to complete questionnaires with STAI scale (State Anxiety Inventory bran) with which it can assess symptoms of anxiety. STAI-has 2 subscales of self independence between them, who appreciate: anxiety STAS -STAS trait anxiety X1 and X2.
STAS X1 defines the current status express intensity of the phenomenon. STAS X2-defines the state fund and express a tendency to perceive stressful events as dangerous and react by increasing anxiety as a state.
The patient responds to each item scale: by assessing on a 4-point scale: STAI X1-1 all, two little, three pretty 4 very much, STAI X2-1 barely 2 sometimes 3 often 4 always middle. Each subscale score is calculated by summing up the points and can range from a score 80 min 20 max values exceeding 40 each subscale are pathological.
Patients completed a questionnaire and BDI for assessing depression which contains 21 items, each graded from 0 to 3 points of progressive intensity. Not include items for exclusion criteria have not made the difference the primary secondary depression or other types of depression between them. Captures well the impending change or a change clinic therapeutic products. It is very useful in monitoring the evolution of depression. All patients performed a stress test strip. All patients gave their written consent to participate in the study.

Results

We found statistically significant differences between patients coming from urban and rural (x2 test, $p = 0.6$), age and ischemic heart disease (t test; $P = 0.23$), male and female (x2 test; $p = 0.58$), smoker and nonsmoker (2 test, p-0.46), appropriate and inappropriate social status (x2 test, $p = 1$) diabetes and without diabetes (x2 test, $p = 0.68$).

Association with the Beck Depression Inventory score and of patients age at onset of ischemic heart disease at baseline: mild depression (36 patients) - 52 ± 4 years; average depression (108 patients) - 52 ± 5 years; severe depression (32 patients) - 49 ± 5 years; depression with suicidal risk (30 patients) - 49 ± 5 years.

To find out if there is a correlation between age and forms of depression patients have applied post hoc tests Games-Howell, Tukey, Gabriel. All 3 tests showed similar results. The group represented statistically was found in the group of patients with depression average age and average form. Lot average age of patients with depression and severe form needed most hospital admission.

Sex association on patients with depression severity no statistically significant association, severe depression being about equal in men and women.

Anxiety as a state evaluation: hospitalization 75.33% had high scores, but at discharge 43.33% also had increased anxiety level. Anxiety as a state had a clinical improvement under treatment instituted as state anxiety level decreased from 52.4 ± 15.5 to 42.7 ± 10.1 (decrease is 22%, p <0.001).

Evaluation of trait anxiety at admission was 42%. Anxiety as a state had a significant evolution during hospitalization (46.7 ± 10.2 versus 45.9 ± 9.8 inpatient hospital discharge).

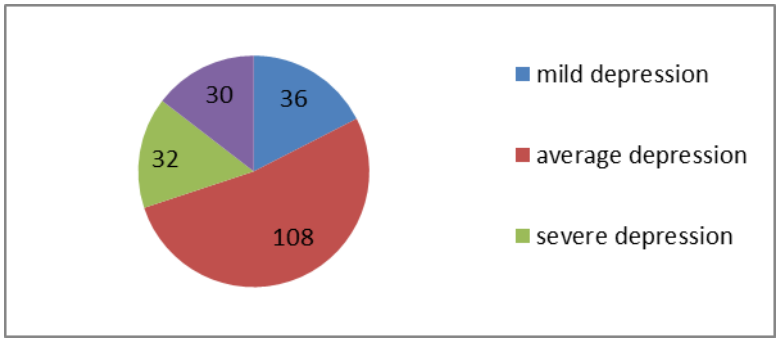

Figure 1. Classification of depression at baseline

**At baseline average number of patients with depression was prevalent form. Patients with suicidal risk was about the same as those with depression severe form, most patients with depression with suicidal risk were traumatized they were diagnosed with ischemic heart disease.*

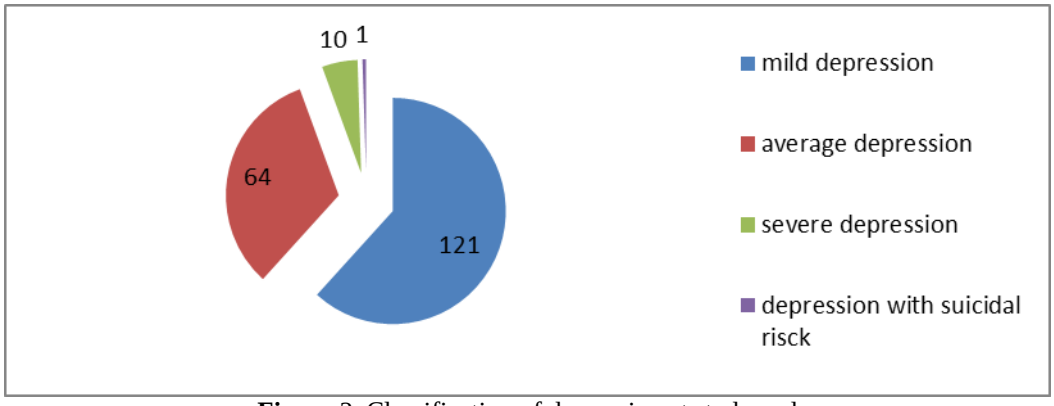

Figure 2. Classification of depression at study end

**When the survey the number of patients with suicidal risk decreased and most patients were diagnosed with depression only mild due to the favorable evolution of the disease and treatment and socio-professional reintegration.*

Subsequent developments patients after discharge 32% of patients were readmitted within 6 months. The level of anxiety was 50.3 ± 5.5 significantly higher than in those who did not require hospitalization 40.4 ± 4.3 (p <0.001). Patients who did not require a new admission over six months has revealed a 68% further reduction of anxiety level as a state average of 12% reaching the level of anxiety in the general population. (35.2 ± 9.3, p <0.001).

As plotters anxiety levels have remained constant while during the 4 years. State anxiety levels as varied In the course of four years. State anxiety scores that have raised every flare-up

of ischemic heart disease in some patients even had the trait anxiety scores in the normal range when placing in the study.
If psychological variables, expressions of anger, based on personality traits we found the strongest correlation was obtained between anxiety and anger subscale suppression.
Quality of life during the year improved significantly by 22% in patients without depression (p = 0.001), with 11.5% in those with mild depression (p = 0.008), 7.8% in those with severe depression (p = 0.032), and only 5% in patients with severe depression (p = 0.078)
I searched through the establishment of a correlation of depression and possible influences of variables independence such as age, duration of disease, the number of exacerbation and evolutionary stage of the disease in a significant margin (p <0.01). The results showed that between depression and age there is a significant correlation (p = 0.044) and depression does not correlate significantly with the evolutionary stage of the disease (p = 0.114). But there is a significant positive correlation between depression and heart disease age p = 0.358 and the number of exacerbation of ischemic heart disease (p = 0.54)
We searched through correlation establish a possible influences of depression and Independence variables such as the state and trait anger, anger suppression, control the hand, index anger P <0.01 associated with subscales of STAS have obtained X1. The results obtained show that the most significant precious correlation's depression scale suppression state of anger (p = 0.768). Significant results were obtained from the state anger, anger trait, control and condition index of anger.
I obtained through a correlation as anxiety condition does not correlate with age, duration of disease, number and stage of disease exacerbation. Intense anxiety trait correlates with age, duration of disease and the number of exacerbations of ischemic heart disease so that patients' younger reacts disease with more anxiety compared to older men.

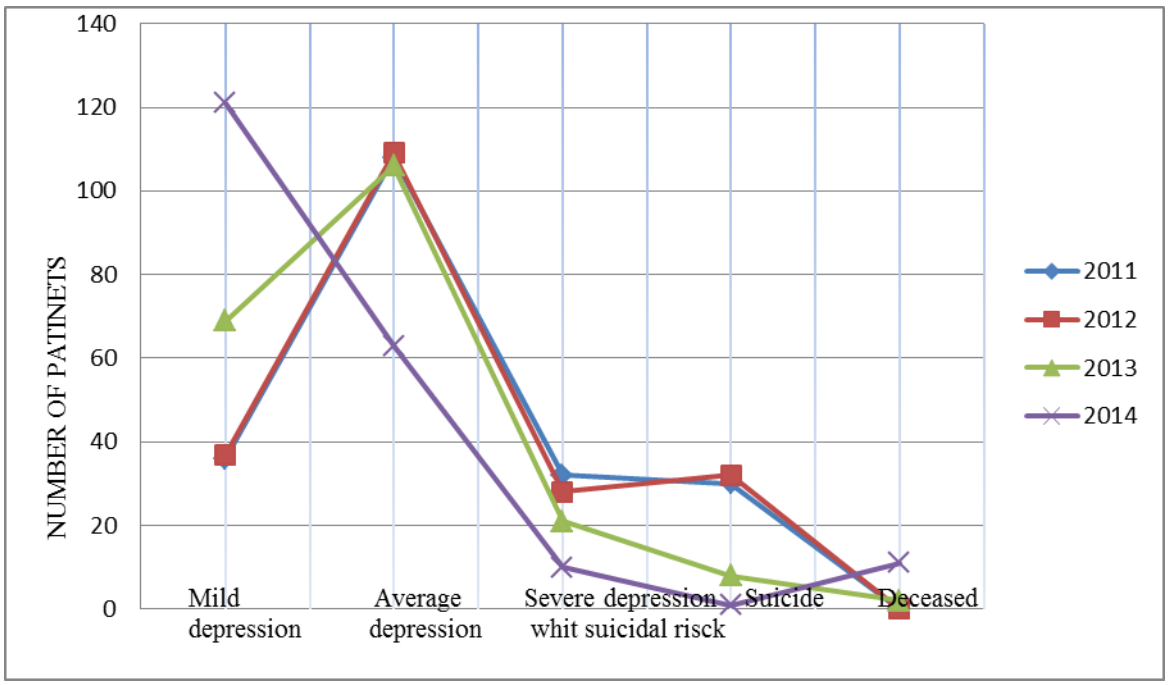

Figure 3. Evolution of the depression years
**At study most patients were diagnosed with depression formed average but with treatment and psychological counseling during the 4 year average number depressed patients down significantly. In the course the 4 years decreased the number patients attempted suicide. Patients who died during the 4 years was due or otherwise ischemic heart disease.*

Discussion
Anxiety is a natural result of human confrontation with a disease or an acute cardiac event and the possibility of living with ischemic heart disease. If anxiety is persistent and high levels it has negative consequences on the evolution of patients with ischemic heart disease. In patients with ischemic heart disease anxiety shows clinical importance because it negatively affects cardiac output by increasing heart rate, which reduces the time coronary perfusion in diastole and unbalanced balance demand (increase)/offer (decreases)

myocardial oxygen reduction of heart rate variability, impaired vagal control, which causes high mortality of patients.
Anxiety is a negative emotional state derived from fear "of not being able to prediction and control" of the disease, or not get the desired results in future situations (4,7,10).
The level of anxiety as a state, is a psychological reaction that accompanies the acute phase of the disease being in close relationship with the progression from the first moment and up to several days or weeks (13).
The decrease anxiety at the time of admission to discharge or reduction is due disappearance and severity of symptoms under treatment and a psychological self-defense mechanism which consists of the patient unconscious rejection of the slopes unpleasant disease (4,5,10). Between the first discharge time of disease onset and longer reassessment 6 months to produce a 15% reduction in anxiety ($p < 0.001$)
The second component of anxiety, trait anxiety defines the state of the patient's own fund and express a tendency to perceive stressful events as dangerous (8,15.) We watched a relationship between the level of trait anxiety and the patient's evolution. We found that in patients with high levels of trait anxiety (36.9%) health improvement was lower by 8.4%. High levels of anxiety can be caused by lack of information about ischemic heart disease and insufficient clinical improvement.
Some studies have enteritis occurrence of assumptions about the connection between anxiety and ischemic heart disease. Anxiety is accompanied by increased activity of the sympathetic nervous sisitemului and increased release of catecholamine (5.8). The sympathetic nervous system plays a major role in the path physiology of heart disease as initial compensatory mechanism, then as a mechanism harmful.
Evolution of physical, mental and social condition of the patient with ischemic heart disease contribute to their own perception of your health condition or disease (2,3,9,11)
Psychosocial factors that cause depression are: Social (reducing social contacts because of the disease, loneliness given the impression of being marginalized and that follows a low living standard, others perceive illness as a state of misery, physical illnesses associated with ischemic heart disease. Psychological (low self-esteem, loss of privacy, physical illnesses Association), biological (loss of neurons, genetic risk, physical illnesses).
People with depression are three components of negative thoughts: 1 intern's my fault, 2nd stable and always will be so, 3-global-will affect my whole life.
I found that the higher the degree of depression is higher the quality of life of patients with ischemic heart disease is affected (12).
Quality of life study period improved by 11.5% in patients with mild depression ($p = 0.008$), 7.8% with moderate depression ($p = 0.032$) and 5% in those with severe depression ($p = 0.078$) statistically insignificant still remain most affected than patients with mild or moderate depression.
Patients with severe depression scores remain 45% higher than those with mild depression, and to those with moderate depression by 30% ($p < 0.01$).

Conclusions

Patients with ischemic heart disease show high levels of anxiety. Anxiety as a state gradually decreases in the first 6 months of treatment. State anxiety levels that are seen in inpatient 75.33% had anxiety scale scores increased as a state. Discharge status anxiety 43.33%, which means that clinical improvement under treatment instituted as state anxiety levels decreased.
Early detection of patients with high levels of trait anxiety can have great practical implications by using specific methods (counseling, drug treatment) to reduce anxiety and would improve the evolution of patients with ischemic heart disease.
Patients with severe depression show an unfavorable outcome with multiple readmissions. Patients with ischemic heart disease with anxiety disorders frequently associated depressive and representing independent risk factors for ischemic heart disease decline.
Anxiety and depression are the consequences of coping mechanisms used in the process of adapting a person to acute or chronic stress. Unfavorable influence on the evolution of depression in patients with ischemic heart disease is caused by elevated levels of catecholamine's and proinflammatory cytokines caused this depression (7). Double-depression relationship is proven ischemic heart disease by increasing coronary risk in terms of the status and depressive but to develop depressive disorder after an acute coronary attack.
Patients with depression are less cooperative effort in testing and compliant to treatment, the higher the degree of depression is higher the stress test is more difficult to perform.

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