Stress, anxiety and depression in patients with cardiovascular diseases

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Abstract

Psycho cardiology is a part of the integrative and holistic psychosomatic medicine. Specific psychiatric disorders, mostly anxiety and depression, apart from having an effect on the process of rehabilitation of patients with a CVD, are also a risk factor for their development. It is considered that CVD is a result of the interaction between various somatic, environmental and behavioral factors. To determine and compare the stress, anxiety and depression levels in patients with cardiovascular diseases and healthy subjects. The research involved 80 patients with cardiovascular disease and 80 healthy subjects (control group). All patients with a CVD were treated at the Clinical for Cardiologic Disease in Skopje. The subjects with a CVD and the subjects from the control group were similar in terms of gender and age. We determined the stress, depression, and anxiety levels in all subjects with the Depression Anxiety Stress Scale - DASS21. The results provide considerable pragmatic findings. Our results showed that patients with cardiovascular diseases experienced higher scores of stress, anxiety, and depression than healthy subjects. From the obtained correlation coefficients, we conclude that there is a statistically significant correlation between stress and CVD (.342), anxiety and CVD (.962), depression, and CVD (.189). At the same time, there was a positive correlation between the levels of stress and anxiety, stress and depression, and anxiety and depression in patients with CVD. The research did not identify differences in the context of stress, anxiety, and depression in healthy subjects. The obtained results show that a correlation exists between cardiovascular diseases and emotional changes that evolve in the person during the disease. Early recognition and treatment of emotional problems affect the quality of life of patients with CVD.

Keywords: Stress, anxiety, depression, patients, cardiovascular diseases.

1. Introduction

Psychocardiology is a part of the integrative and holistic psychosomatic medicine. Researches show that cardiovascular diseases and psychiatric disorders often coexist, therefore the comorbid conditions between these two entities are highly prevalent (Gillette et al., 1997). Specific psychiatric disorders, mostly anxiety and depression, apart from having an effect on the process of rehabilitation of patients with a CVD, are also a risk factor for their development. It is considered that CVD are a result of the interaction between various somatic, environmental and behavioral factors. A large number of risk factors are responsible for the emergence of these diseases (arterial hypertension, increased levels of blood lipids, diabetes, smoking, lifestyle, etc.). In addition to these factors, psychological factors such as stress are also very significant. The familiarity with the risk factors, as well as their mutual relation, provides a new approach not only in regard to the phenomena of the disease, but also in regard to the personality of the diseased person. Negative emotions such as anxiety, hostility, and depressive mood are risk factors for an increased incidence of CVD, but also great prognostic significance (Hemingay & Marmot, 1999). According to the research so far, the personality types A and D have a great predisposition for the development of CVD. At the same time, one should point out that CVD and psychiatric disorders belong to the group of most prevalent diseases in the time we live in, that is, they are the leading causes of mortality and reduction of life skills and working abilities.

Stress and cardiovascular diseases

Stress has an important role in the development of coronary disorders. In this regard, it is very important how stress affects the development of the coronary disease, especially stress associated with a person's everyday life.

The role of stress in everyday life was studied in a longitudinal study by Velheim et al. (1997) who found a high correlation between stress and worsening of the cardiovascular disease among the respondents. Acute stress is usually a provoking factor for the occurrence of acute myocardial infarction. In the multiannual development of coronary disease, chronic stress has a significant pathogenic role.

It is typical that stress can result from changes in the external environment; it can evolve as a result of the interaction between the person and the environment or psychological changes that the very person is going through, which contribute to the emergence and development of the coronary disease. Thereby, it is known that every disease, including myocardial infarction, is a stressful event in life that contributes to the development of certain psychopathological experiences of a person. The rapid and unexpected change of the health condition, as well as the conditions associated with uncertainty and long-term rehabilitation, all lead to increased anxiety and depression.

Numerous researches prove that stress i.e. emotions, indirectly affect the heart's operation, by means of the influence of the symptoms (the excretion of adrenaline and noradrenalin) and the increased mobilization of free fatty acids in the tissue (Schulman et al., 2005; Guler et al., 2009). The increased adrenaline burdens the heart, the elasticity of the blood vessels that narrow down is reduced, the deposition of cholesterol actually occurs due to the agglutination of specific blood particles called platelets, thereby creating atherosclerotic plaques that pose an immense danger for the development of the coronary disease (Sambola et al., 2003).

Interaction between anxiety, depression and cardiovascular diseases

Over the past decades, an increasing attention is being paid to the relationship between depression and anxiety, both at the level of emotions, that is, conditions, as well as at the level of a syndrome and a disorder. Series of results from various researches prove the connection between the symptoms of anxiety and depression (Dickers et al., 2006; Lin et al., 2009).

Anxiety is a biological alarm system that prepares the organism for a mental and somatic reaction to danger. In cardiovascular diseases, anxiety occurs immediately after angina pain or myocardial infarction due to an adequate assessment of the dangerous condition or underestimation of one's own possibilities to cope with the situation (Parker et al., 2001). Thereby, the increased level of anxiety in patients with cardiovascular diseases is explained by the interaction of the cognitive factors (unpleasant thoughts), the physiological factors (increased alertness of the nervous system), and behavioral factors (the increased behavioral response to the disease).

The prevalence of the depressive mood after a myocardial infarction varies from 16 to 23%, and the main risk factors are poor social support, stressful events, and negative emotional experiences (Strik & Honing, 2001). It is certain that depression that occurs after a myocardial infarction reduces the quality of life, it adversely affects cardiac morbidity and mortality (Bush et al., 2001). A depressive mood is accompanied by negative thoughts, pessimism, low life energy, reduced motivation, and a reduced sense of pleasure that can last for a longer period of time. Given these considerations, the main goal of our research was to determine the relationship between stress, anxiety, and depression in patients with CVD.

2. Materials and Methods

The total sample comprises 160 respondents, which we divided into a clinical group and a control group. The clinical group consists of 80 patients with a CVD who were treated at the Clinical for Cardiology Disease in Skopje, and the control group consists of 80 subjects without a CVD or some other chronic disease. The respondents were from 30 to 80 years of age, with an average age of 41.20. In terms of gender, both groups were homogeneous.

All subjects with a CVD were administered a medication therapy recommended by a doctor of internal medicine – a cardiologist, and somatically they were in a stable condition. At the same time, we should point out that 26 patients had experienced an acute myocardial infarction, 20 had angina pectoris, and the remaining 34 subjects had a chronic course of the cardiovascular disease. Patients with CVD were monitored in a period of 4 to 8 weeks in the period from January to March 2019.

In the research we used the Depression, Anxiety and Stress Scale (DASS-21), which consists of 21 claims that refer to the three subdomains: stress, anxiety, and depression. The scale itself is a Linker-type scale, where the higher score refers to an increased level of stress, anxiety, and depression. Each subscale had a good statistical validity with Cronbach = 0.765 for stress, Cronbach = 0.721 for anxiety, and Cronbach = 0.823 for depression for patients with cardiovascular diseases. The internal consistency of the scale for the healthy subjects was Cronbach = 0.723 for stress, Cronbach = 0.763 for anxiety, and Cronbach = 0.768 for depression. A list of data and a coronary list were prepared for the needs of the research.

The statistical processing of the data was performed by using the statistical program SPSS version 20, and we interpreted the results at a level of significance of .01 i.e. .05.

3. Results

Table 1 shows the socio-demographic characteristics of the respondents in terms of gender, age, level of education, marital status, and employment.

Table 1. Socio-demographic characteristics of the examined population

Variables	Clinical group (N=80)	Control group N=(80)
Gender		
Male	40	40
Female	40	40
Age		
M(SD)	42.23 (17.02)	41.14 (16.09)
Education		
Primary	12	14
Secondary	30	17
Higher	38	49
Marital status		
Not married	4	3
Married	76	74
Divorced	2	3
Employment		
Yes	69	64
No	11	16

In the examined population with CVD, we found that the most common risk factors were stress in 62 (77.50%) respondents, increased blood pressure in 56 (70.00%) respondents, and smoking in 39 respondents (48.75%) (Table 2)

Table 2. Risk factors for the emergence of a CVD

Risk factors	Yes	%	No	%
Smoking	39	48.75	41	51.25
Hyperlipidemia	28	35.00	52	65.00
Diabetes	15	18.75	65	81.25
Hypertension	56	70.00	24	30.00
Stress	62	77.50	18	22.50

Table 3 shows a percentage representation of stress, anxiety and depression in the respondents with a CVD and without a CVD, obtained on the basis of DASS-21. From the table we can notice that in the clinical group, stress is present in 58 respondents (72.50%), anxiety was experienced by 64 subjects (80.00%), and depression is present in 54 people (67.50%) of the examined population.

Table 3. Representation of stress, anxiety and depression in the basic group and the control group

Psychological variables	Clinical group		Control group	
	F	%	F	%
With stress	58	72.50	28	35.00
Without stress	22	27.50	52	65.00
With anxiety	64	80.00	17	21.25
Without anxiety	16	20.00	63	78.75
With a depression	54	67.50	24	30.00
Without a depression	26	32.50	56	70.00

From Table 4 we can see that the respondents with a CVD in the DASS-21 Scale have an average result 54.76, and this value for the respondents from the control group is 27.12. In the respondents with a CVD, the average stress value is M=18.34, the average anxiety value is M=19.21, while the average depression value is M=18.89. The average values in the control group are far lower i.e. the average stress value is M=4.23, the average anxiety value is M=8.29 and the average depression value is M=9.38. The comparative analysis between clinical and control group confirmed the existence of all significant differences at the level of $p<.01$, so, stress is a precipitating factor for the emergence of anxiety and depression in patients with a CVD (Figure 1).

Table 4. Stress, anxiety and depression levels in the basic group and the control group

Psychological variable	Clinical group N=80 M(SD)	Control group N=80 M(SD)	F	P
DASS21	54.76 (9.18)	27.12 (6.34)	10.58	0.18*
Stress	18.34 (7.24)	4.23 (1.24)	11.08	0.03**
Anxiety	19.21 (8.45)	8.29 (2.23)	15.34	0.06**
Depression	18.89 (8.01)	9.38 (4.23)	12.24	0.09**

*The difference is significant at a level of p<0.05
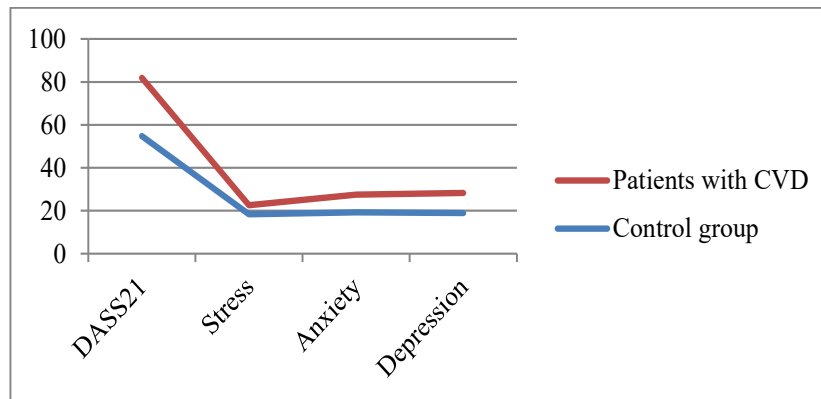 ** The difference is significant at a level of p<0.01

Figure 1. Stress, anxiety and depression levels

Our hypothesis, that a correlation exists between the levels of stress, anxiety and depression in patients with cardiovascular disease, has been confirmed. During our research, we established a positive correlation between stress and CVD (r=0.342, p<.01), anxiety and CVD (r=0.962, p<.01), and depression and CVD (r=0.189, p < .01). We obtained a positive correlation between stress and anxiety levels (r=0.215, p<.05), stress and depression levels (r=0.763, p<.05), and anxiety and depression levels (r=0.218, p<.01), in patients with a CVD (Table 5).

Table 5. Matrix of intercorrelation between stress, anxiety and depression in respondents with cardiovascular diseases

	CVD	Stress	Anxiety	Depression
CVD	1			
Stress	0.342**	1		
Anxiety	0.962**	0.215*	1	
Depression	0.189**	0.763*	0.218**	1

*The difference is significant at a level of p<0.05
 ** The difference is significant at a level of p<0.01

4. Discussion

In our examined population of patients with cardiovascular diseases, we found that anxiety and depression are the most common psychological disorders. The obtained results show that all respondents have higher statistical stress, anxiety and depression values measured according to the DASS-21. Our established hypothesis, that there is a connection between stress, anxiety, and depression in patients with cardiovascular diseases, has been fully confirmed. We consider that the acute myocardial infarction or sudden anxiety pain accompanied by fear, concerns and depressive mood that the person experiences at any period of life, all affect the person's quality of life and working ability. The anxiety in our respondents with cardiovascular diseases was higher in terms of depression. Namely, anxiety in patients with a myocardial infarction is a reaction to existential trauma, because although an infraction is a life-threading condition, still the survival possibilities are significant (Januzzi et al., (2000; Sadock & Sadock, 2003).

At the same time, the presence of comorbid major depression is three times more frequent in patients with cardiovascular diseases than in healthy subjects (Frasure-Smith et al., 1995). Patients who are completely healthy at some point in time face the most severe condition - an acute myocardial infarction, which leads to a disruption of physical and mental health, to confusion of ego, depressive thoughts and bad mood. The patient is tied to the intensive coronary unit, the apparatus, so he/she continues to be dependent on the medical staff, far from the family and the loved ones, therefore depression is even more expressed. If one adds long-term rehabilitation and a change of lifestyle, it all contributes to a changed quality of life in patients with cardiovascular diseases. The results we obtained are consistent with some studies that indicate that depression compared to anxiety has a greater influence on lowering the quality of life after an experienced myocardial infarction (Kiessling & Henriksson, 2004). Depressive mood along with a coronary disease leads to a reduction in the overall physical condition of the person and a disruption of the organism's functionality, which leads to a decreased life satisfaction (Kiessling & Henriksson, 2007; Thombs et al., 2006).

5. Conclusion

We have seen that mental stress has an important role in the development of cardiovascular diseases, it causes an increased activity of the sympathetic system, myocardial ischemia and coronary vasoconstriction. Anxiety is thought to be caused by the fear of a new heart attack, death or reduced working activity. At the same time, the emergence of anxiety is accompanied by depression due to the narcissistic injury, the loss of the object and the sense of guilt. The narcissistic injury is manifested through reduced or lost function, including limited occupational, recreational and social plan. Now death is an ultimate disaster for the Self, and the loss along with premature death has a different meaning depending on the individual emotional investments.

An effective treatment can result in an improved condition of the patient, the patient will feel better, and therefore the subjective improvement of his/her health condition can improve his/her cognitive assessment of the disease and the quality of life. Stress, anxiety and depression, theoretically considered, are emotions that endanger the establishment of a person's mental balance and quality living. The integration processes in a person (that is, the unification of the important dispositions for solving an acute problem or realization of an important goal) can hardly be imagined if a person forms stressful, anxious and depressive tendencies that affect the normal living and functioning, hence a question arises in regard to the place of the psychological intervention in this scheme.

It is appropriate to say that initially more attention should be paid to the medical aspect of the disease, however this does not mean that the care for the mental health should be neglected. Many people find it difficult to accept the fact that they are ill and this hinders both the medical and the psychological treatment. At this specific point there is room for a psychological intervention, helping patients to cope with the disease more easily. However, the psychological treatment continues, because knowing the nature and the outcome of the disease, now the additional help from the psychologist will help to overcome the difficulties that every person experiences under the circumstance of a disease.

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