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STRESS AND CORONARY HEART DISEASE

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Summary. *Background/Aim: The rate of coronary heart disease (CHD) is decreasing in developed countries of the world owing to a modification of risk factors. However, in countries in transition including Serbia and Montenegro the situation is quite the opposite. The aim of this study was to explore the role of acute and chronic stress in development of CHD. Methods: Two groups of examinees were studied: a control group of 170 healthy persons and experimental group of 170 patients with CHD. The group of patients with CHD consisted of 75 patients after acute myocardial infarction and 75 patients after aorto coronary by pass surgery. A semi-standardised interview was used to assess the existence of acute of chronic stress in the studied examinees. Acute stressors were classified in the following categories: (a) death of a close person, (b) threat of loss of a close person, (c) forced change of living place, (d) divorce, (e) loss of job and (f) others. Chronic stress was evaluated by establishing exposition to conflict situations at home or at job. There were three possibilities to answer: never, sometimes, or every day exposure to stressful situations. Results: Considerable difference were not found with regard to to exposition to acute stressors in control and experimental group of examinees. However, chronic exposure to stressful situations at job was more frequent in patents with CHD. There was not a difference between patients after acute myocardial infarction and after aorto coronary by pass surgery. Conclusion: Our data showed that chronic stress at job, not at home, is an important psychological risk factor in development of CHD.*

Key words: *Acute stress, chronic stress, acute myocardial infarction, aorto coronary by pass, risk factor*

Introduction

The second half of the the twentieth century is characterized by an enormous increase in cardiovascular diseases, which became leading cause of morbidity and mortality in developed countries of the world (1). Main reason for this phenomenon is increased number of patients with coronary heart disease (2).

Coronary heart disease (CHD) is the result of an interaction of different somatic environmental and behavioral factors. There are plenty of risk factors (3) responsible for development of CHD (arterial hypertension, dyslipidemia, diabetes mellitus, smoking, sedentary life and others). Besides these, the well known risk factors, psychological factors are also of importance (4). They could be sole, or combined with other risk factors (5). Recognizing these psychological factors enables approach not only to the disease as a sole somatic disorder, but also the approach to the personality of the patient. There fore, it is of great importance to recognise certain characteristics of patient's personality, certain behavioral patterns, exposition to stressful events and patients response to these situations. All of this factors influence treatment of the patient as a whole. The aim of the study was to explore the role of acute and chronic stress in development of CHD.

Subjects and methods

The study included 340 examinees, divided in experimental and control group. Experimental group consisted of 170 patients with CHD: 85 patients after first myocardial infarction (MI) and 85 patients after aorto coronary by pass surgery (ACB). Control group consisted of 170 examinees without cardiovascular or any chronic diseases (Tables 1 and 2). The educational status of examinees is shown in Table 3. The experimental and control group were adjusted to sex and age. All patient with CHD have been treated with drugs prescribed by their physicians (aspirin, beta blockers). The study was performed during the rehabilitation period at The Institute for prevention, treatment and rehabilitation of cardiovascular and rheumatic patients "Niška Banja". The examination was performed in the first three months after MI or ACB.

Table 1. Baseline data of investigated groups

	Experimental group	Control group
Number of examinees	170	170
Age (years)	56.1 ± 7.3	55.3 ± 8.5
Males	133	131
Females	37	39

Table 2. Baseline data of patients in experimental group

	Patients after MI*	Patients after ACB**
Number of patients	85	85
Age (years)	57.9 ± 81	54.3 ± 7.4
Males	63	70
Females	22	15

MI* - myocardial infarction,
ACB**- aorto coronary bypass surgery

Table 3. Educational status of investigated groups

	Experimental group		Control group
	MI*	CBS**	
Elementary	8	9	7
High	44	47	74
Faculty	33	29	89

MI* - myocardial infarction,
CBS** - aorto coronary by pass surgery

The semi-standardized interview (6), based on the psychiatric history, was used to explore exposition to acute or chronic stressful experiences before the first angina or acute myocardial infarction. As acute stressors were taken all events, which could be the cause of abrupt vegetative biochemical response, and happened 24 hours before acute the MI or first anginal pain. Acute stressors were classified (7) in the following categories: (*a*) death of the close person, (*b*) threat of loss of a close person, (*c*) forced change of living place, (*d*) divorce, (*e*) loss of job and (*f*) others. Chronic stress was evaluated by establishing exposition to conflict situations at home or at work. There were three possibilities to answer: never, sometimes or every day exposure to stressful situations.

Using Student's t test performed statistical analysis. The level of significance was set at $p < 0.05$.

Results

Table 4 shows a comparison of acute stressful events in the experimental and control group of examinees. There was not a significant difference among groups of examined persons (X2 = .33; p = 0.51). Loss of job was more frequent in the experimental group of patients, but again, it was not significant.

Table 4. Acute stressful events in experimental and control group of examines

Acute stressful events	Experimental group	Control group
death of the close person	6	4
threat of loss of a close person	5	4
forced change of living place	3	3
divorce	5	4
loss of job	9	5
others	4	2

The exposure to conflict situations at work in the experimental and control group of examinees is shown on Table 5. Patients in experimental group were more frequently exposed to every day conflicts at job, in comparison to persons in control group ($\chi^2 = 13.64$; $p < 0.01$).

Table 5. Conflict situations at job in experimental and control group of examinees

Conflict situations at job	Experimental group	Control group
never	24	46
sometimes	99	99
every day	47	25

Comparison between exposure to conflict situations at home, in experimental and control group of examinees is shown on Table 6. There was a not significant difference among examined groups in any of explored settings ($\chi^2 = 0.3$; $p = 0.86$).

Table 6. Conflict situations at home in experimental and control group

Conflicts situations at home	Experimental group	Control group
never	38	40
sometimes	122	118
every day	10	12

The frequency of exposure to acute stressful events in patients after CBS and patients after acute MI is shown on Table 7. In both groups of patients loss of job was the most frequent stressful event. Serious illness in family members was more frequent in patients after MI, but the differences for all examined stressors were not significant ($\chi^2 = 0.28$; $p = 0.6$).

Table 7. Acute stressful events in patients after aorto coronary by pass and myocardial infarction

Acute stressful events	CBS	MI
death of the close person	3	3
threat of loss of a close person	1	4
forced change of living place	3	2
divorce	5	4
loss of job	2	1
others	2	2

The exposure to conflict situations at job in patients after CBS and MI is shown on Table 8. There were not significant differences in both examined groups ($\chi^2 = 1.57$; $p= 0.64$).

Table 8. Conflict situations at job in patients after aorto coronary by pass and myocardial infarction

Conflict situations at job	CBS	MI
never	12	12
sometimes	47	54
every day	26	19

Results on conflict situations at home in patients after CBS and MI are presented in Table 9. A significant difference was not found in both groups of patients ($\chi^2 = 0.55$; $p = 0.76$).

Table 9. Conflict situations at home in patients after aorto coronary by pass and myocardial infarction

Conflict situations at home	CBS	MI
never	17	21
sometimes	63	59
every day	5	5

Discussion

The recognition of the risk factors for the development of CHD enabled a significant progress in cardiology, especially preventive cardiology (8). A more efficacious treatment of arterial hypertension, dyslipidimias, decreased number of smokers resulted in diminished morbidity and mortality of CHD in developed countries of the world (9). However, in the countries in transition, including Serbia and Montenegro, morbidity and mortality of CHD is increased. Psychological, social and economic factors may explain this phenomenon (10).

Undoubtedly, stress is responsible for the development of many diseases, including CHD (11,12). Long enough, after a stressful experience arterial hypertension remains, as well as cardiac arrhythmias and especially anxiety (13). Acute stress was more frequently the subject of studies in comparison to chronic stress. In a prospective study Verthein et all. followed 42 patients with CHD (14). The patients filled a questionnaire on exposure to stressful situations in the last week. High correlation was found between everyday stress situations and worsening of angina in majority of patients. Acute stress could also trigger a development of acute MI (15).

In our study, the basic statement was that any stress is psychological, because determination depends of stressors, as well as characteristics of the individual. Using a semi- standardized interview we collected data on acute and chronic stressful situations in the experimental and control groups of examinees. In the experimental group there were 32 patients who experienced acute stressful situation before the onset of acute MI. In control group stressful events occurred in 22 examines. However, difference was not significant. For the majority of patients the loss of job indicated as a stressful situation, which led to different emotional reactions, in some aggressive, in some anxious behavior. We didn't find a difference between the experimental and control groups of examines in regard to exposure to chronic stress et home, but did find significant difference in conflict situations at job. The reason for this finding we believe is the fact that our examinees consider job as a high respectable matter. This assumption is in accordance with Adamović's statement that CHD patients are highly narcissistic patients who consider any failure in everyday situations as a fiasco (16). On the other hand, the loss of job in times of transition, with many social and economic embarrassments is more stressful, then in opposite situations. The majority of examinees had high or faculty education. The threat of loss of job with repeated verbal conflicts was the most frequent stressful experience. Unfavorable effects of chronic stress are Especially, noticed in stress of unpredictable duration with unknown outcoms and without previous experience (17).

Patient after MI and CBS did not show differences to exposure, either to acute, or chronic stressful situations. It is quite understandable, because it is essentially the same entity.

Conclusion

The aim of this study was to asses stress as a possible psychological factor in the development of CHD. The study was carried out at The Institute for prevention, treatment and rehabilitation of cardiovascular and rheumatic patient " Niška Banja ". Two groups of examinees were studied: the control group of 170 healthy persons and 170 patients with CHD. The group of patients consisted of 75 patients after MI and 75 patients after CBS.

Differences in regard to exposure to acute stressful events in control and experimental group were not found. However, a considerably more frequent exposure to chronic stressful situations at job in the experimental group of patients was found. Threat of loss of job with repeated verbal conflicts was the most frequent stressful experience. There was not a difference between patients after MI and CBS.

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STRES I KORONARNA BOLEST SRCA

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Kratak sadržaj: *Cilj ove studije je bio da ispita ulogu akutnog i hroničnog stresa u nastanku koronarne bolesti srca. Studijom su obuhvaćene dve grupe ispitanika: kontrolna grupa od 170 zdravih osoba i eksperimentalna grupa od 170 bolesnika sa koronarnom bolešću srca. Bolesnici sa koronarnom bolešću srca su podeljeni u dve podgrupe: 75 bolesnika posle akutnog infarkta miokarda i 75 bolesnika posle hiruškog aortokoronarnog premošćenja. Korišćeni je polustandardizovani intervju za utvrđivanje postojanja akutnih ili hroničnih stresnih situacija.*
Rezultati studije nisu pokazali da je izloženost akutnim stresnim situacijama bila značajnija u grupi bolesnika sa koronarnom bolešću srca u odnosu na zdrave ispitanike. U pogledu izloženosti hroničnim stresnim situacijama utvrđeno je da su stresne situacije na poslu, a ne u kući bile značjno češće u bolesnika sa koronarnom bolešću srca. Razlike nisu postojale između bolesnika posle akutnog infarkta miokarda i hiruške revaskularizacije srčanog mišića. Dobijeni rezultati ukazuju na značajnu ulogu hroničnog stresa na poslu u razvoju koronarne bolesti srca.

Ključne reči: *Akutni stres, hronični stres, akutni infarkt miokarda, aorto koronarni baj pas, faktori rizika*