ORIGINAL ARTICLE

Relationship between depression and quality of life after myocardial infarction

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ABSTRACT

Aim To examine the prevalence of depression in patients after acute myocardial infarction (AMI), as well as the relationship between the depression and quality of life.

Methods The survey was conducted via sociodemographic questionnaire, Beck Depression Inventory (BDI), and Short Form 36 Health Survey questionnaire (SF-36). The result of SF-36 is expressed in subscales that make up the health status profile, i.e. physical functioning, physical role, emotional role, social functioning, mental health, vitality, pain and general health.

Results The study included 120 patients, of which 70 males and 50 females aged between 41 and 88 years (mean 64.73±11.218). All patients were hospitalized at the Clinical Centre of the University of Sarajevo, Clinic for Cardiovascular Disease and Rheumatism, due to complications caused by AMI. After AMI 59 (49.17%) patients had depression. Depression was negatively associated with physical functioning, physical role, emotional role, social functioning, mental health, vitality, pain and general health. Physical functioning ($r= -0.701$; $p<0.01$) and physical role ($r = -0.538$; $p<0.01$) had the highest correlation with depression.

Conclusion The evaluation of depressive symptoms after AMI is imperative, because the appearance of symptoms could have an effect on the patient's quality of life.

Key words: cardiovascular diseases, mental health, patient care, public health

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INTRODUCTION

Nearly two thirds of patients hospitalized for acute myocardial infarction (AMI) develop a mild form of depression; one third of patients develop depression after hospitalisation (1). The complication rate after AMI is significantly higher in patients who have mild, moderate, or severe depressive symptoms than in patients who have minimal depressive symptoms (2). In a study that examined patients hospitalized for AMI, major depression was identified in 19.8% based on a structured interview, and 31.1% of self-reported significant depressive symptoms (3,4). Depression that occurs after AMI is associated with several behaviours leading to an increased risk of mortality and new cardiac events (5-7). Depression is increasingly recognized as one of the factors, i.e. the most common psychological reaction, that contributes to a poorer quality of life after AMI (8). Symptoms of depression are associated with an increased risk of major adverse cardiovascular events (MACE) (2,7). A high level of depression emphasizes the high risk for adverse outcomes and indicates the importance of detecting and treating depression (8). Examining quality of life of patients is extremely important for determining care and identifying appropriate interventions for optimal care (9). Quality of life is significantly lower in people who had AMI compared to the general population (10).

The optimization of pharmacological treatment after AMI must be in accordance with the subjective perception of the problem. We could not find research relating to prevalence of depression in patients after AMI in Bosnia and Herzegovina.

The aim of this study was to examine prevalence of depression in patients after AMI, as well as the relationship between the depression and quality of life.

PATIENTS AND METHODS

Patients and study design

All patients hospitalized at the Clinic for Cardiovascular Disease and Rheumatism of the Clinical Centre of the University of Sarajevo due to complications caused by AMI during the period from January 2020 to July 2020 were involved. Inclusion criteria were patients who were hospitalized for the first time and had AMI for the past two months (confirmed by electrocardiographic changes and markers of cardiac necrosis), patients who underwent revascularization (primary percutaneous coronary intervention (pPCI), percutaneous coronary intervention (PCI) or surgical revascularization), patients over 18 years of age, patients with no previous diagnosis of psychiatric illness. Completing the questionnaires took about 30 minutes.

The study was approved by the Ethics Committee of the Faculty of Medicine, University of Sarajevo, Bosnia and Herzegovina, with the consent of the Clinical Centre of the University of Sarajevo. An informed consent was obtained from all study participants before data collection.

Methods

The survey was conducted via sociodemographic questionnaire, Beck Depression Inventory (BDI), and Short Form 36 Health Survey questionnaire (SF-36).

The sociodemographic questionnaire consisted of basic information: age, gender, data on the time when the incident occurred (AMI), diagnostic, and hospitalization data.

The Beck Depression Inventory (BDI) is a 21-item questionnaire to measure depression symptoms (11). Twenty-one symptoms and attitudes contained in the BDI reflect the intensity of depression; items receive a rating 0-3 to reflect their intensity and are summed linearly to create a score that ranges from 0 to 63. Scores from 0 through 9 indicated no depression. The score of 10 or more indicated the presence of depression (12).

Health status was assessed by the Short Form 36 Health Survey questionnaire (SF-36) (13). It represents a theoretically based and empirically authenticated operationalization of two general health concepts, physical and psychological health, as well as their two general manifestations, functioning, and wellbeing, i.e. functioning at the level of behaviour, estimated wellbeing, limitations of social life and realization of central life roles, and personal self-assessment of overall health. The score was calculated for 8 dimensions of health on a scale from 0 to 100, with 0 representing the worst and 100 the best possible health state. The result was standardly expressed in eight dimensions that make up the health status profile: physical functioning (consists of 10 par-

ticles), limitations due to physical difficulties (3 particles), limitations due to emotional difficulties (3 particles), social functioning (2 particles), mental health (5 particles), energy and vitality (4 particles), physical pain (2 particles) and perception of general health (5 particles).

Statistical analysis

The normality of distribution was tested. Due to significant deviation of distribution from normality, the collected data were analysed by non-parametric procedures. For data processing, the Mann-Whitney U and Spearman's correlation coefficient was used. All results with $p<0.05$ were considered statistically significant.

RESULTS

The study included 120 patients, of which 70 males and 50 females, aged between 41 and 88 years (mean age 64.73±11.218). A total of 61 (50.83%) patients after AMI had no depression symptoms (BDI <10), and 59 (49.17%) patients had depression (BDI≥10). Depression was not detected in 38 (31.67%) males and 23 (19.16%) females, while depression symptoms were detected in 32 (26.67%) males and 27 (22.50%) females.

The correlation analysis indicated a negative significant relationship between depression and all eight subscales of quality of life. Physical functioning ($r = -0.701$; $p <0.01$) had the highest correlation with depression; there was also very high correlation between depression and physical role ($r= -0.538$; $p <0.01$), pain ($r= -0.477$; $p <0.01$), general health ($r= -0.510$; $p <0.01$) and vitality ($r= -0.453$; $p <0.01$) (Table 1).

Statistically significant differences in physical functioning ($p<0.05$) and general health ($p<0.01$) between males and females of the age of 65 were found. In physical functioning and general health females had lower scores than males. Under the age of 65 males had lower mean score in general health than females (27.51 and 37.81, respectively), but females had lower level in emotional role than males (24.79 and 35.74, respectively) (Table 2).

Table 2. Difference between subscales of quality of life according to age and gender

Subscale	Gender and age (years)	Mean rank*	p
Physical functioning	M <65	30.67	0.648
	F <65	32.81	
	M ≥65	34.17	0.019
	F ≥65	23.75	
Physical role	M <65	32.67	0.503
	F <65	29.65	
	M ≥65	28.97	0.786
	F ≥65	30.15	
Emotional role	M <65	35.74	0.014
	F <65	24.79	
	M ≥65	31.33	0.327
	F ≥65	27.25	
Social function	M <65	33.62	0.239
	F <65	28.15	
	M ≥65	28.22	0.517
	F ≥65	31.08	
Mental health	M <65	32.45	0.602
	F <65	30.00	
	M ≥65	28.97	0.790
	F ≥65	30.15	
Vitality	M <65	29.41	0.248
	F <65	34.81	
	M ≥65	32.73	0.101
	F ≥65	25.52	
Pain	M <65	31.17	0.856
	F <65	32.02	
	M ≥65	29.81	0.875
	F ≥65	29.12	
General health	M <65	27.51	0.028
	F <65	37.81	
	M ≥65	36.11	0.001
	F ≥65	21.37	

*average of the ranks for all observations within each sample
M, males; F, females;

There was no statistically significant difference between emotional role subscale and depressive symptoms. Statistically significant differences between physical functioning ($p<0.01$), physical

Table 1. Correlations between depression and subscales of quality of life

	Depression	Physical functioning	Physical role	Emotional role	Social function	Mental health	Vitality	Pain	General health
Depression	1	-0.701	-0.538	-0.212	-0.359	-0.218	-0.453	-0.477	-0.510
Physical functioning		1	0.679	0.366	0.379	0.278	0.547	0.558	0.657
Physical role			1	0.396	0.473	0.358	0.528	0.547	0.510
Emotional role				1	0.587	0.611	0.416	0.368	0.339
Social function					1	0.644	0.544	0.473	0.330
Mental health						1	0.466	0.371	0.410
Vitality							1	0.517	0.741
Pain								1	0.606
General health									1

role ($p<0.01$), social function ($p<0.01$), mental health ($p<0.05$), vitality ($p<0.01$), pain ($p<0.01$), and general health ($p<0.01$) with depressive symptoms were found (Table 3).

Table 3. Difference between subscales of quality of life with symptoms of depression

Subscale	BDI score	Mean rank*	p
Physical functioning	<10	80.89	0.000
	≥10	39.42	
Physical role	<10	75.30	0.000
	≥10	45.19	
Emotional role	<10	66.14	0.055
	≥10	54.67	
Social function	<10	68.58	0.009
	≥10	52.14	
Mental health	<10	67.27	0.030
	≥10	53.50	
Vitality	<10	72.39	0.000
	≥10	48.20	
Pain	<10	74.34	0.000
	≥10	46.19	
General health	<10	75.34	0.000
	≥10	45.16	

*average of the ranks for all observations within each sample
BDI, Beck Depression Inventory questionnaire score

DISCUSSION

This study has shown depression in 49.17% of patients, and the onset of depression affected quality of life. The obtained results are in accordance with research of Serpytis et al. in which 49.38% of respondents had depressive symptoms (14).

Females are at higher risk of developing depression, also a higher percentage of females develop depression compared to males, as well as a higher number of complications after AMI (2, 14-16). Depressive symptoms increase the number of complications in females by 40% and males by 33% after control of clinical variables and sociodemographic parameters (2). WHO data also suggest that females suffer twice as much from a depressive disorder that males (17). According to our results, 54.2% of males and 47.5% of females had a depressive disorder, which is consistent with Serpytis et al. study in which 63.1% were males and 36.9% females (14).

According to our results all physical health concepts had a high correlation with depression, while vitality had the highest correlation with depression regarding psychological health concepts.

Eight of eleven studies examining the association of gender identity with quality of life suggest that females have lower scores on quality of life scales than males. The differences between males and females who had AMI mostly related to physical spheres (16), which has been confirmed in our study for the group of females above the age of 65.

The results of our study indicate a significant difference between physical functioning, physical role, social function, mental health, vitality, pain, and general health with depressive symptoms; additionally, there was a negative relationship between depression and all eight subscales of quality of life. These results were consistent with a research of Mei et al. analysing 325 patients with cardiovascular disease, which found a negative correlation between depression and quality of life (18). Mollon et al. found that patients who survived AMI compared to the control group reported poorer overall health 2.7 times more and limitations in daily activities 1.5 times more (10).

According to the obtained data, patients after AMI had significantly reduced quality of life and symptoms of depression, which indicates the importance of evaluating mental status and discomfort of the patient during hospitalization, and monitoring and networking patients with support systems that can help rehabilitation after AMI (19). Choo et al. found statistically significant difference between the results before and after rehabilitation, where patients reported a lower level of depression and a higher level of physical and mental quality of life (20). Because depression acts as the primary determinant of the quality of life of heart patients, i.e. patients who had AMI, the impact of depression on health care and insurance costs is not negligible (21). Depression is closely linked to disability, but also to productivity at work, which not only complicates the lives of patients but also other family members where patient care costs increase and reduce the scope and ability of patients' active work (21).

The results of our study and overall research addressing the impact of depression on quality of life and outcomes should be a major public health concern. Depression after acute myocardial infarction is associated with an increased mortality rate, the occurrence of major adverse cardiovascular events (MACE), and adherence to therapeutic modality (22-24). Patients with depression have a difficult time gradually returning to physical exercise, which is required from the second week of recovery (25). Self-discipline

and motivation are critical after acute myocardial infarction, as is appropriate stress management, along with patients' trust in their physician, and regular follow-up examinations, which is difficult in patients with signs of depression (25,26).

There were several limitations to the present study. The first one is that the study had only one measure point. Also, the sample was small and this study may be a good basis for new research, with a larger sample.

In conclusion, our research supports previous ones identifying depression as a strong predictor of quality of life in people with AMI, as well as the association of depression with quality of life. The evaluation of depressive symptoms after AMI is imperative. Clinical interventions, which are aimed at ensuring not only physical functioning and health in conducting daily activities but also at improving mental health, can contribute to improved quality of life of AMI patients. Working with patients who had AMI takes additional effort and dedication. The categorization of patients based on the existence of depression symptoms is an important part of the therapy following acute myocardial infarction.

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TRANSPARENCY DECLARATION

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