Health-related quality of life in patients after the acute myocardial infarction

Research Article

Nataša K. Rančić*[1,2], Branislav D. Petrović[1,2], Svetlana R. Apostolović [1,3],
Biljana N. Kocić[1,2], Mirko V. Ilić[2]

1 University of Niš, Faculty of medicine Niš, Serbia

2 Center for disease control and prevention, Institute for Public Health Niš

3 Clinic for cardiovascular diseases, Clinical Center Niš

Abstract: Introduction: Acute myocardial infarction has a negative impact on patient's quality of life. The aim of this paper was to evaluate the health-related quality of life in patients one month after the acute myocardial infarction. Material and method. The study involved 160 patients of both sexes, 30 to 79 years of age. The health-related quality of life in patients was assessed at the admission at the coronary care unit, and one month after. The following questionnaires were used: EuroQuolVAS and EuroQuol 5 Dimension. Angina pectoris was ranked according to the Canadian Cardiovascular Society Classification. Results: Men and women evaluated their health condition in a similar way (60.48 ± 11.98 vs 60.55 ± 12.24). Patients who (have) undergone primary coronary intervention had significantly higher average scores on EuroQuolVAS than the patients who were treated with thrombolytic therapy (68.69 ± 9.67 vs 52.31 ± 7.87, $p<0.001$). Modest and severe problems were the most presented in answers to those questions: pain/discomfort, anxiety/depression and self-care. Both men (0.92 ± 0.43 vs 3.27 ± 0.59, $p<0.001$) and women (0.89 ± 0.46 vs 3.19 ± 0.55, $p<0.001$) had significantly lower average marks of angina pectoris one month after the acute myocardial infarction than at the admission to the hospital. Conclusion: One month after the acute myocardial infarction the quality of life in patients was very impared. Patients who undergone to the primary coronary intervention evaluated their health condition as better than the patients who were treated with thrombolytic therapy. Those patients also had the lower average marks of angina pectoris and the higher health-related quality of life.

Keywords: Acute myocardial infarction • Health-related quality of life

© Versita Sp. z o.o

1. Introduction

Ischaemic heart disease (IHD) is the most prevalent chronic disease worldwide [1]. Acute myocardial infarction (AMI) with stroke is the leading cause of morbidity, the premature death and disability among men and women aged 55 to 64 years in Serbia [2].

The quality of life is not only a harmony inside a man, but also a harmony between a man and his world [3]. The overall quality of life (QL) comprises all factors which influence on someones health and health-related quality of life (HRQL) comprises only those factors which are the part of someone's health [3,4].

AMI has negative consequences on the HRQL of the patients and that leads to the lowering of their HRQL even several years after the AMI [6-9].

During the first month after the AMI patients are very vulnerabile physically, mentally and emotionally [10]. According to the results of investigations it was determined that HRQL among the patients was disordered and lower and the main reason for that was the presence of the chest pain or discomfort and the lowering of the overall physical function [11-13].

Dispnea [11-13], weakness [12-13] and sleeping problems more frequent in women than in men [5-17]. The results of other investigations as a principal

* E-mail:natasa.rancic@medfak.ni.ac.rs

problem during the first month after AMI emphase the appearance of depression in both men and women and it causes the lowering of their HRQL [18-20].

There are some investigators who pointed out that the HRQL after the first AMI was lower in women than in men [21-23], but there are others, who found differences between men and women that were not statistically significant [22,24].

The objective of the paper was to assess the health-related quality of life among the patients one month after the acute myocardial infarction and to compare.

2. Materials and methods

Prospective cohort study was done. The data about the patients were obtained from the Population-Based Register of Acute Coronary Syndrome of Serbia. The study involved only patients with the diagnosis of AMI (code I21 according to the 10th International Diseases Clasification-ICD). The study involved 160 new diagnosed patients aged 30-79, from the urban area of the city of Niš.

Self-administered questionnaires EuroQolVAS (EQVAS) and EurQol 5 Dimension (EQ5D) were used. Angina pectoris (AP) was ranked according to the Canadian Cardiovascular Society Classification (CCS).

Criterias for the patients involving into the study were as follows:
• it was their first AMI in their lives
• aged 30 to 79
• the patient who suffered from the AMI was admitted in the Coronary Care Units (CCU) and after the hospital treatment the patient was discharged.
• communication with the patient was possible
• the patient was from the urban area of the city of Niš
• those patients put the signature for the approval to participate in the study

Criteria for the excluding patients of the study were:
• previous AMI
• new AMI within the 30 days after the first AMI
• AMI-related complications
• death of some patients

All the patients were informed in detail about the aims of the study. The Ethical Committee of the Faculty of Medicine in Niš gave its approval for the study.

The diagnosis of the AMI had been made by the cardiologist in the CCU according to the criteria from the Convention in 2007 [25].

2.1. Questionnaires

To investigate the HRQL these generic questionnaires were used: Serbian version of the EQVAS and EQ5D [26].

EQ-5D is a standardized measure of health status developed by the EuroQoL Group in order to provide a simple, generic measure of health for clinical and economic appraisal [24]. EQ-5D is designed for self-completion by respondents. Essentially the EQ-5D descriptive system and the EQ visual analogue scale (EQVAS), [26,2].

The EQVAS records the respondent's self-rated health on a vertical, visual analogue scale where the endpoints are labelled 'Best imaginable health state' and 'Worst imaginable health state.' This information can be used as a quantitative measure of health outcome as judged by the individual respondents. The higher score in EQVAS was the better health condition was [26,27].

The EQ-5D descriptive system comprises the following 5 dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Each dimension has 3 levels: no problems, some problems, severe problems. The respondent is asked to indicate his/her health state by ticking (or placing a cross) in the box against the most appropriate statement in each of the 5 dimensions. This decision results in a 1-digit number expressing the level selected for that dimension. The digits for 5 dimensions can be combined in a 5-digit number describing the respondent's health state.

Validity of these questionnaires for the evaluation of HRQL of the patients with AMI were tested and retested in many surveys and in different European countries and the questionnaires were evaluated as valid and sensible [28].

3. Statistical analysis

All the calculations were done in SPSS version 10.0 and S-PLAS programme, version 2000.

The following statistical parameters were calculated: arithmetic mean, standard deviation (SD) and structure index (%). In order to compare the average numerical values, Student's t-test was used. The Mann-Whitney U test was used when distribution of values had not been of normal disposition.

For comparison of the frequency characteristics when one of the expected frequency characteristics was

less than five, the Mantel-Haensezel Chi square test or Ficher's test of exact possibility was used.

In all statistical analysis as the limit of statistical significance of the default error estimate of 5% (p<0.05).

4. Results

A total number of 160 patients completed questionnaires one month after the AMI. There were significantly more men then women (66.3% vs 33.7%, X^2=20.38 and p= 0.0000064). The basic characteristics of the patients are shown in Table 1.

Table 1. The basic demographic characteristics of patients

Patients	Average age in years		Significance p
	Men	Women	
Total (n=160)	61.13±8.63	61.86±9.39	t=0.59 and p=0.56
Thrombolytic therapy (n=80)	60.71±9.21	62.27±9.36	t=0.57 and p=0.57
PCI (n=80)	60.57±8.50	61.97±9.65	t=0.32 and p=0.75

Men and women were of similar age (61.13±8.63 vs 61.86±9.39). Men from both subgroups of patients were younger than the women, but the determined difference was not significant statistically. Table 2 shows the average scores on the EQVAS in the patients.

Table 2. The average scores on the EQVAS in patients

Patients (n=160)	Average scores on EQVAS in patients with diagnosed AMI	Significance
	At the admission in CU	P
Thrombolytic therapy (n=80)	43.68±11.14 One month after AMI 52.31 ± 7.87	p<0.001
PCI (n=80)	At the admission in CU 47.69±11.11 68.69 ± 9.67	p<0.001

Patients who were undergone PCI had higher average scores on EQVAS compared with the patients who were treated with thromobolytic therapy (68.69±9.67 vs 52.31±7.87, p<0.001).

The average scores on EQVAS by gender and by age in patients are shown in Table 3.

According to the data in Table 3, one month after the AMI the average scores on EQVAS in sick men and in sick women was similar (60.48±11.98 vs 60.55±12.24).

Men and women similarly assessed their health condition one month after the AMI. One month after the AMI patients younger than 65 years of age and those

Table 3. The average scores on EQVAS by gender in patients

Patients (n=160)	Average scores on EQVAS
Gender	Men 60.48±11.98
	Women 60.55±12.24
	Comparison n.s.
Age	<65 61.48±12.44
	>65 59.20±11.43
	Comparison n.s.

Table 4. The frequency of answers in EQ5D qustionnairy in patients

Questionnary EQ5D Dimmensions of HRQL	Answer	Patients (n=160)	Significance p
Mobility	No problems Modest Severe	35.4% 60.4% 10.2%	X^2=44.99 p<0.001
Self-care	No problems Modest Severe	25% 66.7% 8.3%	X^2=232.04 p<0.001
Usually daily activities	No problems Modest Severe	1.7% 25.8% 72.5%	X^2=338.39 p<0.001
Pain/Discomfort	No problems Modest Severe	0.8% 56.7% 42.5%	X^2=270.62 p<0.001
Anxiety/ Depression	No problems Modest Severe	0.8% 62.1% 37.1%	X^2=192.17 p<0.001

patients who were older than 65 years of age had similar average scores on the EQVAS.

Results from the EQ5D questionnaire one month after the AMI are shown in Table 4.

One month after the AMI modest and severe problems were the most frequent answers on these questions: mobility (60.4%), self-care (66.7%), usually daily activities (72.5%), pain/discomfort (56.7%) and anxiety/ depression (62.1%).

The average marks of angina pectoris one month after the AMI are shown in Table 5.

According to the presented results the average marks of AP in men were significantly higher compared with the same values in women (0.92±0.43 vs 0.89±0.4, p<0.001).

One month after the AMI the average mark of AP in men who were undergone the PCI were significantly lower then in women (0.98±0.31 vs 1.04±0.20, p<0.001).

Women who were treated with thromolytic therapy had significantly lower average mark of AP compared with the women who were undergone the PCI (0.76±0.58 vs 1.04±0.20, p<0.001).

Table 5. The average marks of angina pectoris at the admission in intensive care unit and one month after the AMI

Patients	Gender	Average marks of AP one month after the AMI	Significance P
Thrombolytic therapy(n=80)	Men	0.86±0.53	<0.001
	Women	0.76±0.58	<0.001
	Comparison	n.s.	
PCI(n=80)	Men	0.98±0.31	<0.001
	Women	1.04±0.20	<0.001
	Comparison	n.s.	
Total(160)	Men	0.92±0.43	<0.001
	Women	0.89±0.46	<0.001
	Comparison	n.s.	

5. Discussion

According to the presented results in the paper the HRQL in patients one month after the AMI was very disordered. Similar findings exist in the literature [31]. Men and women who suffered from the AMI did not differ significantly according to the assessment of their health condition and the HRQL one month after the AMI.

The most important factors which influenced on the HRQL one month after the AMI were: chest pains of different intensity and modest or even severe anxiety/depression.

Earlier studies found an association between depression and poor health status in patients diagnosed with ischaemic heart diseases (IHD) and that depression itself is an independent factor for developing sudden cardiac death [32,33]. Depression increases the risk of fatal AMI, but the mechanism is still unclear [32].

Presence of chronic pains in the body with anxiety and depression lead to a significant reduction of the total physical capacity and significantly impair the functionality of the body [33].

Bogg et al. (2000) find that depression is a major predictor for recovery of physical dimension of HRQL.

Guck et al. (2001) showed that 65% of patients who suffered from the AMI were depressive before the appearance of the AMI.

Green et al. (2009) pointed out that depression is very common in patients after the AMI, and numerous studies have reported an association of depression with the appearance of new coronary events and increased mortality after coronary events occurred.

Depression in the early recovery phase after AMI is considered the main factor that leads to a lowering of HRQL in patients of both sexes, because of its the negative impact on physical health [31-35].

In women's subjective assessment of their health condition in the first month after the AMI experienced was somewhat better than in men (32.9% vs 29.6%) but it was not statistically significant differences.

Bogg et al. (2000) indicate that women who experience a coronary event (are) more anxious than men. There are different results, according to which there is no significant difference between the sexes in relation to HRQL in the early recovery phase, due to the presence of these symptoms.

Depression in the early recovery phase after AMI is considered the main factor that lowers the HRQL in patients of both sexes, because the negative impact on physical health [34].

One month after the AMI patients younger than 65 years of age had assessed their health condition and their HRQL similarly as patients older than 65 years of age.

According to the results of Bengston et al. (2004), patients older than 59 years evaluated their HRQL after AMI to be lower than in patients under the 59 years of age even two years after the AMI.

The results of this study showed that one month after AMI, HRQL was significantly impaired in all the patients, regardless of the therapy. These results confirm the results from literature [36,37].

At one month, most HRQL measures were similar for both examined groups, but patients who undergone PCI reported less bodily pain than patients treated with thrombolytic therapy.

Women had a lower HRQL in all dimensions in the questionnaire EQ5D, especially in the dimensions of usual daily activities and pain/discomfort. Similar data had shown Asadi-Lari et al. (2005).

Previous studies have established that one month after AMI women had lower HRQL than men because they are significantly more likely to have chest pain [12].

Bogg et al. (2000) pointed out that women had lower emotional function as a fundamental value, one, three and six months after the AMI. Papers of Breznika et al. (1998), Bogg et al. (2000) suggested that women who experience a coronary event were more anxious than men. There are different results, according to which there is no significant difference between men and women in relation to the HRQL in the early recovery phase after the AMI [12].

Ulvik et al. (2008) showed that the reduced physical function affects the difficulty performing normal daily

activities due to symptoms of IHD, and thus significantly reduces HRQL.

According to the presented results in this paper patients who undergone the PCI had higher HRQL than patients who were treated with thrombolytic therapy.

Studies have confirmed that PCI is more effective than intravenous thrombolytic therapy [38]. Patients who had undergone PCI had significantly faster recovery in the early postinfarction period, higher reduced of chest pains and a higher HRQL compared with patients who were treated with thrombolytic therapy [38,39,41-43].

Spertus et al. (2003) believes that one of the most common indication for implementation of percutaneous coronary reperfusion is to improve the HRQL of patients.

Some investigations has shown that reducing the intensity of the chest pains has a great influence on the improvement of HRQL in patients after the AMI [7, 44,49,50,52].

According to the Prospective Registry Evaluating Myocardial Infarction: Event and Recovery-PREMIER which involved 2498 patients from 19 hospitals in the USA, the occurrence of angina pectoris one month after the AMI was associated with higher mortality of the patients and the lower HRQL [52].

Spertus and al. (2006) determined that more than 25% of patients who suffered from the AMI had angina pectoris one month after the AMI.

We found that the average marks of AP in men were significantly higher compared with the average marks in women at the admission in intensive CU. Severity and frequency of angina pectoris is one of most important predictors of physically and emotionally function as well as the improvement of HRQL both in men and in women [45-47].

According to our findings one month after the AMI the average marks of AP in men who undergone the PCI were significantly lower then in women. Others studies [38,39,41-43] found similar results.

Spertus et al. (2006) showed that incidence of angina pectoris in patients before performing the PCI is important predicative factor of the HRQL after the PCI, as well as the age and the physical function.

Kissling and al. (2007) showed that even two years after the AMI despite the significantly lowering the severity of angina pectoris, the HRQL didn't significantly increased.

According to the results of Third Randomized Intervention Trial of Unstable Angina (RITA-3) angina pectoris of range 1 by CCS was decreased the HRQL for 10%, and the higher the range of angina pectoris was the greater improvement of the HRQL had been [53].

Studies have shown advantages of PCI in early postinfarction phase [38,41-44]. Despite the advantages of early invasive treatment of AMI are well known the HRQL in patients after the PCI remains unknown [39].

6. Conclusion

One month after the acute myocardial infarction patients had very impaired HRQL. Lowering the chest pains had the greatest influence on improving patient´s HRQL in the early postinfarction recovery. Patients who undergone PCI had significantly higher HRQL compared with patients who were treated with thrombolytic therapy.

References

[1] Durmaz T., Özdemir Ö., Özdemir A.B., Keleş T., Bayram A.N., Bozkurt E. Factors affecting quality of life in patients with coronary heart disease. Turk J Med sci 2009, 39(3):343-351

[2] Incidence and mortality of acute coronary syndrome in Serbia. Register for acute coronary syndrome of Serbia. Institute for public health "Dr Milan Jovanović Batut", 2007. Belgrade

[3] Spilker B.Quality of Life Studies: Definitions and Conceptual Issues (page 16). Quality of life and pharmacoeconomics in clinical trials. 2. ed Philadelpia Lippincot-Raven, 1996:1259

[4] Elinkton J. Medicine and quality of life. Annals Int med 1996; 64:711-714

[5] Daily J., Elliott D., Cameron-Traub E. et al. Health status, perceptions of coping, and social support immediately after discharge of survivors of acute myocardial infarction. Am J Crit Care 2000, 9:62-9

[6] Yousefy A., Keshtiary N., Yamani N., Rabiei K., Baghbanian P. Quality of life in post infarction patients with or without cardiac rehabilitation. Research Journal of Biological Sciences 2009; 4(1):54-58

[7] Kiessling A.Quality of care and quality of life in coronary artery disease, 2005. Karolinska Institutet At Danderyd University Hospital, Department Of Internal Medicine, Stockholm, Sweden

[8] Wiklund I., Herlitz J., Hjalmarson A. Quality of five years after myocardial infarction. Euro Heart J 1989;10:464-272

[9] Westin L., Carlsson R., Israelsson B., Willeheimer R., Cline C., McNeil T.F. Quality of life in patients

with ischaemic heart disese: a prosspective controlled study. J Intern Med 1997; 242 (3): 239-247

[10] Kristofferzon L.M., Lőfmark R., Carlsson M. Perceived coping, social support, and quality of life 1 month after myocardial infarction: A comparison between Swedish women and men.Heart&Lung, 2005: 34(1): 39-50

[11] Kiessling A., Henriksson P. Time trends of chest pain symptoms and health related quality of life in coronary artery disease. Health Qual life Outcomes 2007, 6;5:13

[12] Grawely-Witte S. The impact of angina and cardiac history on health-related quality of life and depression in coronary heart disease patients. Chronic Illnes 2007; 3(1):66-76

[13] Järvinen O., Saarinen T., Julkunen J, Huhtala H., Tarkka M.R. Changes in health-related quality of life and functional capacity following coronary artery bypass graft surgery. Euro J Cardiothorac Surg 2003; 24:750-756

[14] Westwin L., Carlsson R., Erhardt L., Cantor-Graae E., McNeil T. Differences in quality of life in men and women with ischemic heart disease. A prospect controlled study. Scand Cardiovascular J. 1999;33(3): 160-165

[15] Wake R., Yoshiyama M. Gender differances in ischaemic heart disease. Recent patents on cardiovascular Drug Discovery 2009; 4:234-240

[16] Deshotels A., Planchock N., Dech Z., Prevost S. Gender differences in perceptions of quality of life in cardiac rehabilitation patients. J Cardiopulm Rehabil 1995;15:143-148

[17] Mohsen A.L., Packham C., Gray D. Gender difference in health-related needs and quality of life in patients with acute chest pain. The British Journal of Cardiology, 2005;12(6):459-464

[18] Wiklund I., Herlitz J., Johanson S., Bengston A., Karlson B.W., Persson N.G. Subjective symptoms and well-being differ in women and men after myocardial infarction. Euro Heart J 1993;14:1315-1319

[19] Rosengren A., Hawken S., Ounpuu S., Sliwa K., Zubaid M., Almahmeed W.A., et al. Association of psychosocial risk factors within risk of acute myocardial infarction in 11119 cases and 13648 controls from 52 countries (the INTERHEART study): case-conrol study. Lancet 2004;364 (9438):953-962

[20] Rozanski A., Blumenthal J., Kaplan J. Impact of psychological factors on the pathogenesis of cardiovascular disease and implications for therapy. Circulation 1999; 99: 2192-2217

[21] Lane D., Carroll D., Ring C., Beevers D.G., Lip GY. Effects of depression and anxiety on mortality and quality of life 4 months after myocardial infarction. J Psychosom Res. 2000; 4984: 229-238

[22] Norekval M.T., Wahl K.A., Fridlung B., Nordrehaug E.J., Wentzel-Larsen T., Hanested R.B. Quality of life in female myocardial survivors: a comparative study with a randomly selected general female population cohort. Health and Quality of Life Outcomes, 2007;5(58):1-6

[23] Colleen M.N., John A.S., Jensen, M.N., Johnson J., Hegadoren K.M., William A.G. Sex and Gender Discrepancies in Health-Related Quality of Life Outcomes Among Patients With Established Coronary Artery Disease. Circulation: Cardiovascular Quality and Outcomes, 2008;1:123-130

[24] Bogg J., Thornton E., Bundred P. Gender variability in mood, quality of life and coping following primary myocardial infarction. Coronary Health Care 2000; 4:163-168

[25] Vučinić Ž. Nova univerzalna definicija infarkta miokarda. Šta je promenjeno? Vojnosnit Pregl 2008; 65(3): 239-244

[26] EuroQol Group. EuroQoL-a new facility for the measurement of health-related quality of life. Health Policy 1990,16:199-208

[27] Rabin R, de CharroF. EQ-5D: a measure of health status from the EuroQol Group. Ann Med 2001;33(5):337-343

[28] Nowles D., Mc Gloin, Westfall J.M., Holcont S. Validation of the EQ-5D qualitity of life instrument in patients after myocardial infarction. Quality Life Res 2005;14(1):95-105

[29] Wilson I.B., Cleary P.D. Linking clinical variables with health-related quality of life. A conceptual model of patient outcomes. JAMA 1995;273:59-65

[30] Spertus J., Conard M. Health status assessment. In:Weintraub WS, ed Cardiovascular Health care Economics. Totowa, NJ:humana Press; 2003:81-89

[31] Pedersen S.S., Denollet J. Perceived health following myocardial infarction cross-validation of the Health Complaints Scale in Danish patients. Behaviour Research and Therapy 2002;40:1221-1230

[32] Guck T.P., Kavan M.G., Elsasser G.N., Barone E.J. Assessment and treatment of depression following myocardial infarction. Am fam Physician, 2001; 64(4):641-648

[33] Green A.L., Arbor A., Dickinson P.W., Nease E.D. Jr, Schellhase G.K., Campos-Outcalt D. et all. AAFP Guideline for detection and management of post-myocardial infarction depression. Annals of Family Medicine, 2009; 7:71-79

[34] Breznika V, Kitte F. Psychological factors of coronary heart disease in women: a review. Social Science and Medicine 1996;42:1351-1365

[35] Asadi-Lari M, Chris Packham C, Gray D. Patients' satisfaction and quality of life in coronary artery disease. Health Qual Life Outcomes 2003; 1:57

[36] Ulvik B., Nygard O., Hamestard B.P,. Wentzel-Larsen T., Wahl A.K. Association between severity, coping and dimension of health-related quality of life in patients admitted for elective angiography-across sectional study. Health Quol Life Outcomes 2008, 6:38

[37] Bengsston I., Hagman M., Währborg P., Wedel H. Lasting impact on health-related quality of life after a first myocardial infarction. International Journal of Cardiology 2004; 97(3): 509-516

[38] M., Bjorner J.B., Oldenburg B., Newman B,. Groenvold M., Madsen J.K. Quality of life one month after thrombolysis or primary PCI in patients with ST-elevation infarction. A DANAMI-2 sub-study. Scand Cardiovascular J 2005; 39(4): 206-212

[39] Pilote L., Lauzon C., Huynh T., Dion D., Roux R., Racine N., et al. Quality of Life After Acute Myocardial Infarction Among Patients Treated at Sites With and Without On-site Availability of Angiography. Arch Intern Med 2002;162:553-559

[40] Versteeg H., Pedersen S.S., Ruud A. M. Erdman M.A.R., van Nierop I.W.J,. de Jaegere P., van Domburg T.R. Negative and positive affect are independently associated with patient-reported health status following percutaneous coronary intervention. Qual Life Res 2009; 18(8): 953–960

[41] Hoenig M.R., Doust J.A., Aroney C.N,, Scott I.A. Early invasive versus conservative strategies for unstable angina & non-ST-elevation myocardial infarction in the stent era. Cochrane database syst Rev 2006; CD004815 http://www.ncbi.nlm.nih.gov/pubmed/16856061

[42] Wong M.S., Chair S.Y. Changes in health-realted quaulty of life following percutaneus coronary intervention: a longitudinal study. Int J Nurs stud 2007; 4488):1334-1342

[43] Ostojić M. Perkutane koronarne intervencije kod bolesnika sa akutnim koronarnim sindromom bez ST segment elevacije. Acta clinica 2006;6(1):114-124

[44] Falcoz P.E., Chockon S., Laluc F., Puyraveau M,. Kaili D., Mercer M. et al. Gender analysis after elective open heart surgery two-year comparative study of quality of life. Ann Thorac Surg 2003; 81:1637-1643

[45] Ecochard R., Colin C., Rabilloud M., de Gevigney G., Cao D., Ducreux C. et all. Indicators of myocardial dysfunction and quality of life, one year after acute infarction. European Journal of Heart Failure 2001;3(5):561-568

[46] Maddox M.T., Reid J.K., Rumsfeld S.J., Spertus J.A. One-year health status outcomes of unstable angina versus myocardial infarction: a prospective, observational, cohort study of ACS survivors. BMC Cardiovascular Disorders 2007; 7:28

[47] Failde I.I., Soto M.M. Changes in Health-Related Quality of Life 3 months after an acute coronary syndrome. BMC Public Health 2006, (27);6:18

[48] Jerlock M. Patients with unexplaned chest pain-pain experience, stress, coping and health-related quality of life. PhD thesis, Institute of Health and Care Sciences. Göeteborg University, Sweden, 2007.

[49] Taylor R., Kirby B., Burdon D., Caves R. The assessment of recovery in patients after myocardial infarction using three generic quality-of life measures. J Cardiopulm Rehabil 1998;18(2):139-144

[50] Mickkley H., Agner E., Saunmaki K., Botker H.: Sexual activity in ischaemic heart disease. Risk and therapeutic possibilities. Ugeskr-Laeger 2001;163(5): 603-607

[51] Kcochard R., Cyrille C., Mureiel R., Gevigney de Guy., Cao Danièle., Corinne D. et al. PRIMA group. Indicators of myocardial dysfunction and quality of life, one year after acute infarction. Europian Journal of Heart Failure 2001;3:561-568

[52] Spertus A.J., Dawson J., Masoudi A. Frederisk, Krumholz MH, Reid J. Kimberly, et al. Prevalence and Predictors of Angina Pectoris One Month After Myocardial Infarction. Am J Cardiol 2006;2006:282-288

[53] Pocock S.J., Henderson R.A., Seed P., Treasure T., Hampton J.R. Quality of life, employment status, and anginal symptoms after coronary angioplasty and bypass surgery. 3-years follow-up in the Randomized Intervention Treatment of Angina (RITA) Trial. Circulation 1996;94(2):135-142