ORIGINAL ARTICLES

UDC: 616.127-005.8-06
https://doi.org/10.2298/VSP171011163L

Predictors of health related quality of life three years after myocardial infarction with ST segment elevation

Prediktori kvaliteta života povezanog sa zdravljem tri godine nakon infarkta miokarda sa elevacijom ST segmenta

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Abstract

Background/Aim. Health-related quality of life (HRQoL) is an important indicator of patient condition following myocardial infarction. It may serve as a predictor of mortality and new hospitalization. The aim of this study was to evaluate the association of selected sociodemographic and clinical characteristics with HRQoL in the Serbian cohort of patients with myocardial infarction with ST segment elevation (STEMI) that were treated with primary percutaneous coronary intervention (pPCI). **Methods.** Patients were recruited from the population of patients with STEMI who were hospitalized in the Clinical Center of Serbia in Belgrade, between 1st December, 2009 and 30th June, 2010. The study was conducted among 507 STEMI patients treated with pPCI. The HRQoL was assessed using the Questionnaire Short Form Health Survey (SF-36). Multivariate logistic regression models were used for each components score in order to determine independent predictors of HRQoL. **Results.** The patients with the lowest tertiles of Physical component score (PCS) and the Mental component summary score (MCS) were older, likely to be females, unpartnered, with a poor economic status, with diabetes, with prior myocardial infarction and with more extensive coronary artery disease. There were more employed and the individuals with smoking history in the group of patients with the higher scores. The characteristics of patients with lower PCS score were: the higher presence of hypertension, prior cerebrovascular insult and left anterior descending artery as infarct artery. This study demonstrated that HRQoL was significantly associated with patient's age, gender, diabetes mellitus, a poor way of living and loneliness. Furthermore, the presence of previous cerebrovascular insult seems to affect the physical component score. **Conclusion.** Knowledge of predictors of HRQoL in the STEMI patients may provide indications for optimal treatment and anticipate their impact on the treatment outcome.

Key words:
st elevation myocardial infarction; health; quality of life; surveys and questionnaires.

Apstrakt

Uvod/Cilj. Kvalitet života povezan sa zdravljem (KŽPZ) je važan pokazatelj stanja bolesnika posle preživelog infarkta miokarda i može da posluži kao prediktor mortaliteta i nove hospitalizacije. Cilj studije bio je da se proceni povezanost odabranih sociodemografskih i kliničkih karakteristika sa KŽPZ u grupi bolesnika iz Srbije sa infarktom miokarda sa ST elevacijom (STEMI) koji su tretirani primarnom perkutanom koronarnom intervencijom (pPKI). **Metode.** Bolesnici su regrutovani iz populacije pacijenata sa STEMI koji su bili hospitalizovani u Kliničkom centru Srbije u periodu od 1. decembra 2009. do 30. juna 2010. Studija je sprovedena među 507 STEMI bolesnika koji su tretirani sa pPKI. KŽPZ je procenjen korišćenjem kratke forme upitnika *36-item Short Form Health Survey* (SF-36). Multivarijantni logistički regresioni modeli su korišćeni za svaki kompozitni skor kako bi se utvrdili nezavisni prediktori KŽPZ. **Rezultati.** Bolesnici sa najnižim tercilima Fizički kompozitni skor (PCS) i Mentalni kompozitni skor (MCS) bili su stariji, najčešće ženskog pola, sami, sa lošim ekonomskim statusom, sa dijabetesom, prethodnim infarktom miokarda i ekstenzivnijom koronarnom bolešću. U grupi bolesnika sa višim skorovima, bilo je više zaposlenih i osoba sa istorijom pušenja. Kod bolesnika sa nižim tercilom PCS postojala je veca zastupljenost hipertenzije, prethodnog moždanog udara i leve prednje descendentne arterije kao infarktne arterije. Ova studija je pokazala da je KŽPZ značajno povezan sa starošću bolesnika, polom, lošim ekonomskim statusom, usamljenošću i dijabetesom. Prisustvo prethodnog moždanog udara utiče samo na fizički kompozitni skor. **Zaključak.** Poznavanje prediktora KŽPZ kod STEMI bolesnika može da obezbede indikacije za optimalni lečenje STEMI i da predvidi njihov uticaj na ishod lečenja.

Ključne reči:
infarkt miokarda sa st elevacijom, zdravlje; kvalitet života; ankete i upitnici.

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Introduction

Among cardiovascular diseases a myocardial infarction with ST-elevation (STEMI) remains to be a significant cause of morbidity and mortality throughout the world [1, 2]. Conventional treatment is mostly related to extending life, survival and functional outcome. Nevertheless, mortality rates and morbidity are not so valid measures of outcome as they do not reflect all aspects of health [3]. The length of life is considered to be as important as the quality of the additional life years gained by the majority of patients. The priority of today's medicine should be to improve patients' quality and quantity of life [4]. The assessment of health-related quality of life (HRQoL) has become an important part of everyday clinical practice. In the patients with the acute coronary syndrome HRQoL is an important outcome measure because it measures the illness perception instead of the disease itself. HRQoL was recognized to define health from the patients' perspective, in terms of how individuals feel and how they evaluate their health and future prospects [5]. Although there is no universal agreement on what constitutes HRQoL, the current assessment focuses on the domains of social functioning, physical functioning and psychological functioning [6].

There has been little systematic research on quality of life of patients after surviving STEMI. A few studies investigating HRQoL after myocardial infarction mostly focused on the clinical characteristics and treatment procedures, but they failed to take into account the socioeconomic status in their analysis [7, 8]. According to some investigators, the socioeconomic factor seems to have a great impact on HRQoL [9, 10]. The knowledge of predictors of HRQoL in the STEMI patients may provide some indications for further interventions, improve risk stratification in clinical practice and finally lead to the enhancement of secondary prevention. Therefore, the aim of our study was to examine the relationship between the socioeconomic, demographic and clinical parameters and HRQoL three years after surviving STEMI.

Methods

The study population consisted of 531 consecutive patients admitted to the Clinical Center of Serbia in Belgrade for the primary percutaneous coronary intervention (pPCI) after setting the diagnosis of STEMI between 1st December, 2009 and 30th June, 2010. The patients were contacted three years later in order to fulfill a questionnaire, the 36- Item Short Form Health Survey (SF-36). During a three-year follow-up, 73 patients died (52 male and 21 female). Including deaths, the information on HRQoL for 507 patients was available. Twenty- four patient who were alive and could not be contacted by phone or did not show up for the final examination in order to fill in the questionnaire SF-36 were automatically excluded from the study. Finally, the information about HRQoL was available for 507 patients (including those who died).

The study was performed in accordance with the ethical standards laid down in the Declaration of Helsinki and was approved by the Ethics Committee of the Faculty of Medicine, University of Belgrade, Serbia as an obligatory procedure for the PhD thesis.

The diagnosis of STEMI was established and pPCI performed using the guidelines for the management of acute myocardial infarction in the patients presenting with the ST-segment elevation of European Society of Cardiology [11]. In brief, the patients with an episode of chest pain within the last 12 hours and ST-elevation on electrocardiography (ECG) in at least two consecutive leads were included. After pPCI, the patients were hospitalized at the Cardiology Department with continuous clinical, ECG, laboratory and echocardiography monitoring. Echocardiography was performed in the first week of myocardial infarction, on the ultrasonic unit Vivid 4, according to the clinical standard and in accordance with the recommendations related to the current echocardiography guidelines [12].

The data collection was undertaken during the hospitalization period. All recruited patients were interviewed and examined using the standardized methods and instruments. The data was collected regarding demographic, anthropometric, cardiovascular risk factors and medical history prospectively, along with baseline clinical data at the hospital admission.

Three socioeconomic variables were used: education level, living conditions and employment status. The education level was subdivided into two levels: primary, on one hand and secondary and tertiary education on the other. Living conditions were defined using the following question: Considering the monthly resources of your household, how would you say that they allow you to live? Response items "very hardly" and "hardly" were grouped into "poor way of living" and response items "easily" and "very easily" into "good way of living". Also, this study included two other variables: employment on one side, and unemployment and retired on the other.

Age, sex and marital status were used as demographic variables in the analysis. Age was subdivided into two levels less than 70 years and older than 70 years. Marital status was defined as a dichotomous variable: married or other.

The cardiovascular risk factors that were included in the study were history of smoking, diabetes mellitus, hypertension, hyperlipoproteinemia and obesity. Smoking was assessed using two categories: never smoker on one side and previous smoker and active smoker on the other. The diagnosis of hypertension, diabetes and hyperlipoproteinemia was set according to the current guidelines. Obesity was diagnosed if a person had the body mass index more than 30 m^2/kg.

Previous cardiovascular events that were included in the analysis were: the previous myocardial infarction, prior cerebrovascular insult and previous revascularization. For all patients who reported such event the medical records were checked up. For the purpose of this study, the parameters for severity of STEMI were included and comprised the following clinical characteristics: infarction localization, infarct artery, extensivity of coronary artery disease and ejection fraction of left ventricle (visually estimated using echocardiography).

Health status

To determine HRQoL among the patients with STEMI, the generic questionnaire SF-36 was chosen to be used. The reliability, validity and responsiveness of the SF-36 is well-documented in the patients with coronary artery disease [7]. The SF-36 assesses eight health status domains: Physical functioning, Role physical functioning, Role emotional functioning, Mental health, Vitality, Social functioning, Bodily pain and General health. The scale scores are obtained by summing the items together within a domain. The scoring of eight SF-36 subscales followed the standard procedures and used a 0-100 point scale where 100 is the best and 0 the worst possible score [13]. For the examinees who died, we assumed that they had the worst HRQoL and it was marked 0.

Based on the eight subdomains, the Physical and Mental Component summary scores can be calculated according to an algorithm, with the subdomains Physical functioning, Role physical functioning, Bodily pain and General health being the primary contributors to the Physical component score (PCS) and Role emotional functioning, Vitality, Social functioning, and Mental health being the primary contributors to the Mental component score (MCS) [14].

Statistical analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS) software (version 18, SPSS, Inc, Chicago, IL, USA). The continuous variables were expressed as mean ± standard deviation and categorical variables with frequency and percentage. For the comparison of categorical variables, the χ^2 test was used, while the independent Student's *t*-test and one-way ANOVA were used for the continuous variables. The stepwise multivariate logistic regression analysis was performed to determine the independent predictors for HRQoL. Differences were considered significant at the value of $p < 0.05$.

Results

In the analysis, 393 male patients and 114 female patients were enrolled. The average values of PCS score according to the analyzed variables are shown in Table 1. The significantly lower values of HRQoL in the PCS domains were observed among the all analyzed variables except dislipidemia and obesity. On the contrary, the employed and individuals with smoking history had the significantly higher average values of PCS score (Table 1).

The lower average values of MCS score were recorded among females, individuals older than 70 years, less educated and among individuals with poor way of living. On the contrary, the significantly higher average values of MCS score were recorded among the employed and individuals with smoking history. Among the individuals with diabetes mellitus and hypertension, the lower values of MCS score were recorded. Also, the presence of prior myocardial infarction, prior cerebovascular insult, prior revascularization and the presence of clinical parameters for severity of STEMI led to the significantly lower average values of MCS score (Table 2).

The crude relationship between tertiles of PCS and study variables is given in Table 3. In the group of patients with the lowest PCS score, there were more females, elderly patients, unpartnered ones and individuals with poor economic status. Also, diabetes mellitus was more prevalent among the patients in the lower tertile of PCS, as well as hypertension, prior myocardial infarction and prior cerebrovascular insult (CVI). The presence of clinical parameters for severity of STEMI was more commonly altered among the patients in the lowest PCS tertile. On the other hand, in the group of patients with the highest PCS scores, a significantly higher percentage of the employed and the individuals with smoking history were recorded (Table 3).

According to the data in Table 4, the patients with the lowest tertiles of MCS were older, likely to be females, unpartnered with a poor economic status, with diabetes, with prior myocardial infarction and with more extensive coronary artery disease. On the other hand, there were more employed and the individuals with smoking history in the group of patients with the higher MCS score.

When the multiple logistic regression was applied, it was revealed that being alone, poor way of living, older age, diabetes mellitus and female gender were the independent predictors for the lower PCS and MCS score. The presence of prior cerebrovascular insult turned out to be the independent predictor for the PCS score (Table 5).

Discussion

This study aims to identify the characteristics of patients with STEMI at the time of their initial hospitalization because of pPCI that were the independent predictors of HRQoL three years after the admission. The functional status was demonstrated to be important, since the higher PCS and MCS were associated with 5%–8% reduction in the risk for hospitalization and 9%–23% reduction in mortality [15]. Furthermore, it was suggested that for optimal treatment of STEMI it was necessary to recognize the patients' differences and their impact on the outcomes of care.

This study revealed that gender, age, socio-economic status and diabetes mellitus were the most important predictors of HRQoL three years after STEMI. It was revealed that female gender was an independent predictor for a poor HRQoL. These results are consistent with the findings of other authors, who had also determined that the gender was an independent predictor for HRQoL in the patients with the acute coronary syndrome. Namely, Pettersen et al. [7] found that two and a half years after the acute coronary syndrome, the female gender was a predictor for worse HRQoL. Furthermore, Mortensen et al. [8] found that after NSTEMI, the women had lower HRQoL than the man, even though they were treated with PCI. These results are in accordance with the findings of Westin et al. [16] and Dias et al. [17] who reported that the female gender was a predictor of worse mental health scores; in contrast, they connected the male gender as a predictor of higher physical health scores.

Table 1

Mean values of Physical component summary (PCS) scores at 36th month follow-up depending on the presence of analyzed baseline variables

Variables	n	Mean PCS ± SD	*p*
Gender			
female	114	34.29 ± 17.92	0.001
male	393	38.95 ± 19.03	
Age (years)			
≥ 70	105	28.16 ± 16.46	< 0.001
< 70	402	40.44 ± 21.38	
Education			
primary	58	31.49 ± 18.89	< 0.001
secondary & university	449	36.97 ± 20.51	
Marital status			
unapartnered	44	17.87 ± 17.35	< 0.001
partnered	463	38.99 ± 22.89	
Occupational activity			
unemployed & retired	353	35.49 ± 17.99	0.005
employed	154	41.77 ± 18.54	
Economic status (way of living)			
poor	170	32.09 ± 17.50	< 0.001
good	337	42.78 ± 19.72	
History of smoking			
yes	391	39.69 ± 17.01	0.001
no	116	31.88 ± 20.94	
Diabetes mellitus			
yes	102	29.83 ± 16.80	< 0.001
no	405	39.93 ± 21.41	
Hypertension			
yes	335	35.99 ± 16.81	0.001
no	172	41.61 ± 18.70	
Dyslipidemia			
yes	291	39.43 ± 18.90	0.028
no	216	35.83 ± 17.64	
Obesity			
yes	112	39.76 ± 16.45	0.265
no	395	37.57 ± 18.57	
Prior MI			
yes	62	31.98 ± 20.19	0.006
no	445	38.72 ± 17.84	
Prior CVI			
yes	23	25.10 ± 20.57	0.001
no	484	38.51 ± 17.94	
Prior revascularizastion			
yes	25	27.54 ± 22.62	0.004
no	482	38.44 ± 17.86	
Infarct localisation			
anterior	218	35.89 ± 16.81	0.031
other	289	39.42 ± 19.88	
Infarct artery			
LAD	222	35.80 ± 19.94	0.022
other	285	39.54 ± 16.68	
Extensivity of CAD			
multi	330	36.03 ± 16.31	0.002
single	177	41.38 ± 18.98	
Ejection fraction (%)			
≥ 40	438	40.12 ± 22.04	<0.001
< 40	69	23.79 ± 16.55	

MI – myocardial infarction; CVI – cerebrovascular insult; LAD – left anterior descending artery; CAD – coronary artery disease; SD – standard deviaton.

Table 2
Mean values of Mental component summary (MCS) scores at 36th month follow-up depending on the presence of analyzed baseline variables

Variables	n	Mean MCS ± SD	*p*
Gender			
female	114	36.56 ± 19.09	0.008
male	393	42.08 ± 21.04	
Age (years)			
≥ 70	105	31.87 ± 17.46	<0.001
< 70	402	43.16 ± 24.60	
Education			
primary	58	31.49 ± 9.76	< 0.001
secondary & university	449	40.50 ± 18.89	
Marital status			
unpartnered	44	18.52 ± 18.64	< 0.001
partnered	363	42.06 ± 24.05	
Occupational activity			
unemployed & retired	353	35.49 ± 17.99	0.001
employed	154	41.77 ± 18.54	
Economic status (way of living)			
poor	170	34.68 ± 18.50	<0.001
good	337	46.03 ± 10.38	
History of smoking			
yes	391	42.71 ± 23.06	<0.001
no	116	34.57 ± 18.15	
Diabetes mellitus			
yes	102	31.96 ± 17.98	<0.001
no	405	43.06 ± 23.36	
Hypertension			
yes	335	39.34 ± 17.87	0.017
no	172	43.75 ± 20.38	
Dyslipidemia			
yes	291	41.56 ± 20.96	0.340
no	216	39.87 ± 18.64	
Obesity			
yes	112	43.59 ± 19.97	0.116
no	395	40.28 ± 17.69	
Prior MI			
yes	62	31.98 ± 17.84	0.006
no	445	38.72 ± 20.19	
Prior CVI			
yes	23	25.10 ± 17.94	< 0.001
no	484	38.51 ± 20.57	
Prior revascularizastion			
yes	25	29.20 ± 19.24	< 0.001
no	482	41.45 ± 24.13	
Infarct localisation			
anterior	218	38.51 ± 18.30	0.020
other	289	42.60 ± 21.14	
Infarct artery			
LAD	222	38.46 ± 18.21	0.016
other	285	42.70 ± 21.17	
Extensivity of CAD			
multi	330	39.05 ± 17.03	< 0.001
single	177	44.17 ± 20.74	
Ejection fraction (%)			
≥ 40	438	42.79 ± 25.94	< 0.001
< 40	69	28.50 ± 17.74	

MI – myocardial infarction; CVI – cerebrovascular insult; LAD – left anterior descending artery; CAD – coronary artery disease; SD – standard deviation.

Table 3

Baseline characteristics according to tertiles of Physical component summary (PCS) scores

Variables	PCS ≤ 36.6 (n = 163)	36.7 < PCS > 45 (n = 168)	PCS ≥ 45 (n = 176)	*p*
Gender, n (%)				
female	52 (31.90)	43 (25.60)	19 (10.80)	0.002
male	111 (68.10)	125 (74.40)	157 89.20()	
Age (years), mean ± SD	62.46 ± 11.81	58.98 ± 10.73	55.68 ± 10.60	0.104
Education, n (%)				
primary	25 (15.34)	21 (12.50)	12 (6.82)	< 0.001
secondary & university	138 (84.66)	147 (87.50)	164 (93.18)	
Marital status, n (%)				
unpartnered	22 (13.50)	12 (7.14)	10 (5.68)	0.021
partnered	141 (86.50)	156 (92.86)	166 (94.32)	
Occupational activity, n (%)				
unemployed & retired	123 (75.46)	126 (75.00)	104 (59.09)	0.027
employed	40 (24.54)	42 (25.00)	72 (40.91)	
Economic status (way of living), n (%)				
poor	73 (44.79)	57 (33.93)	41 (23.30)	0.002
good	90 (55.21)	111 (66.07)	137 (77.84)	
History of smoking, n (%)				
yes	113 (69.33)	131 (77.98)	147 (83.52)	0.017
no	50 (30.67)	37 (22.02)	29 (16.48)	
Diabetes mellitus, n (%)				
yes	49 (30.06)	31 (18.45)	22 (12.5)	0.001
no	114 (69.93)	137 (81.55)	154 (87.50)	
Hypertension, n (%)				
yes	120(73.62)	116 (69.05)	99 (56.25)	0.028
no	43 (26.38)	52 (30.95)	77 (43.75)	
Dyslipidemia, n (%)				
yes	85 (52.15)	96 (57.14)	110 (62.50)	0.175
no	78 (47.85)	72 (47.17)	66 (37.50)	
Obesity, n (%)				
yes	29 (17.79)	45 (26.79)	38 (21.59)	0.048
no	134 (82.21)	123 (73.21)	138 (78.41)	
Prior MI, n (%)				
yes	29 (17.79)	17 (10.12)	16 (9.09)	0.020
no	134 (82.21)	151 (89.88)	160 (90.01)	
Prior CVI, n (%)				
yes	14 (8.59)	5 (2.98)	4 (2.27)	0.008
no	149 (91.41)	163 (97.02)	172 (97.73)	
Prior revascularizastion, n (%)				
yes	12 (7.36)	7 (4.17)	6 (3.41)	0.133
no	151 (92.64)	161 (95.83)	170 (96.59)	
Infarct localization, n (%)				
anterior	79 (48.47)	64 (38.10)	75 (42.61)	0.056
other	84 (51.53)	104 (61.90)	101 (57.39)	
Infarct artery, n (%)				
LAD	84 (51.53)	61 (36.31)	77 (43.75)	0.005
other	79 (48.47)	107 (63.69)	99 (56.25)	
Extensivity of CAD, n (%)				
multi	120 (73.62)	109 (64.88)	101 (57.39)	0.022
single	43 (26.38)	59 (35.12)	75 (42.61)	
Ejection fraction (%), mean ± SD	44.58 ± 10.53	50.89 ± 9.22	51.55 ± 8.90	< 0.001

MI – myocardial infarction; CVI – cerebrovascular insult; LAD – left anterior descending artery; CAD – coronary artery disease; SD – standard deviation.

Table 4

Baseline characteristics according to tertiles of Mental component summary (MCS) scores

Variables	MCS ≤ 39,3 (n = 163)	39.4 < MCS >52.4 (n = 165)	MCS≥52.5 (n = 179)	*p*
Gender, n (%)				
female	55 (33.74)	34 (20.61)	25 (13.97)	< 0.001
male	108 (64.29)	131 (79.39)	154 (86.03)	
Age (years), mean ± SD	63.09 ± 11.29	57.41 ± 10.11	56.48 ± 11.47	< 0.001
Education, n (%)				
primary	24 (14.29)	19 (11.52)	15 (8.38)	0.188
secondary& university	139 (82.74)	146 (88.48)	164 (91.62)	
Marital status, n (%)				
unpartnered	22 (13.50)	14 (8.48)	8 (4.47)	0.029
partnered	141 (86.50)	151 (91.52)	171 (95.53)	
Occupational activity, n (%)				
unemployed & retired	124 (76.07)	124 (75.15)	105 (58.66)	0.018
employed	39 (23.93)	41 (24.85)	74 (41.34)	
Economic status (way of living), n (%)				
poor	78 (47.90)	51 (30.91)	41 (22.91)	< 0.001
good	85 (52.15)	114 (69.09)	138 (77.09)	
History of smoking, n (%)				
yes	112 (68.71)	129 (78.18)	150 (83.80)	0.010
no	51 (31.29)	36 (21.82)	29 (16.20)	
Diabetes mellitus, n (%)				
yes	50 (30.67)	26 (15.76)	26 (14.56)	< 0.001
no	113 (69.33)	139 (84.24)	153 (85.47)	
Hypertension, n (%)				
yes	115 (70.55)	110 (66.67)	110 (61.45)	0.223
no	48 (29.45)	55 (33.33)	69 (38.55)	
Dyslipidemia, n (%)				
yes	88 (53.99)	102 (61.82)	101 (56.42)	0.148
no	75 (46.01)	63 (38.18)	78 (43.58)	
Obesity, n (%)				
yes	30 (18.40)	39 (23.64)	43 (24.02)	0.218
no	133 (75.46)	126 (76.36)	136 (75.98)	
Prior MI, n (%)				
yes	28 (17.18)	16 (9.70)	18 (10.06)	0.030
no	135 (82.82)	149 (90.30)	161 (89.94)	
Prior CVI, n (%)				
yes	12 (7.36)	6 (3.64)	5 (2.79)	0.068
no	151 (92.64)	159 (96.36)	174 (97.21)	
Prior revascularizastion, n (%)				
yes	12 (7.36)	7 (4.24)	6 (3.35)	0.136
no	151 (92.64)	158 (95.76)	173 (96.65)	
Infarct localisation, n (%)				
anterior	81 (49.69)	68 (41.12)	69 (38.55)	0.074
other	82 (50.31)	97 (58.79)	110 (61.45)	
Infarct artery, n (%)				
LAD	83 (50.92)	69 (41.82)	70 (39.11)	0.057
other	80 (49.08)	96 (58.18)	109 (60.89)	
Extensivity of CAD, n (%)				
multi	119 (73.01)	102 (61.82)	109 (60.89)	0.022
single	44 (26.99)	63 (38.18)	70 (39.11)	
Ejection fraction(%), mean ± SD	45.27 ± 10.77	50.00 ± 9.02	51.76 ± 9.52	< 0.001

MI – myocardial infarction; CVI – cerebrovascular insult; LAD – left anterior descending artery; CAD – coronary artery disease; SD – standard deviation.

Table 5

Results of multivariate logistic regression analyses for the association between patient characteristics and Health Related Quality of life (HRQoL)

Variables	PCS score		MCS scores	
	OR (95% CI)	*p*	OR (95% CI)	*p*
Age (continous)	1.029 (1.009–1.049)	0.004	1.037 (1.016–1.058)	< 0.001
Female gender	3.182 (1.280–6.910)	0.013	3.153 (1.268–7.836)	0.007
Poor way of living	2.826 (1.229–4.787)	0.005	2.255 (1.411–3.603)	0.001
Unpartnered	1.578 (1.011–2.462)	0.045	1.614 (1.063–2.427)	0.036
Diabetes mellitus	1.731 (1.055–2.842)	0.030	1.874 (1.134–3.096)	0.017
Prior CVI	2.597 (1.08–5.103)	0.035	-	-

CVI – cerebrovascular insult; PCS – Physical component summary; MCS – Mental component summary; OR – odds ratio; CI – confidence interval.

The reason for the gender influences on HRQoL in the patients with myocardial infarction is not clear. According to some authors, this gender difference could be explained by the fact that women are increasingly confronted with continuing demands at home and neglect their health needs [9, 18]. On the other hand, according to van Jaarsveld et al. [19] , lower HRQol in women can be explained by higher prevalence of depression among the female patients, limitations of physical and social activity, causing increased escalation of stress and frustration.

Apart from the gender, according to numerous studies, the age plays an important role in HRQoL. Therefore, Jankowska-Polańska et al. [20] in their study indicated that the age of patients negatively affect HRQoL. These findings are in accordance with findings of Beck et al. [21] who also reported older age to be an independent predictor of impaired SF-36 PCS and MCS scores for the population with myocardial infarction who had received PCI. This study confirmed the previous findings, because it was also found that older age was a predictor of poorer HRQoL. The reason why older age negatively influences HRQoL may be explained by the age-related conditions such as frailty limiting the older people physical activity and compounded by other comorbidities that characterize the older population [22].

The presence of risk factors for the coronary artery disease and their impact on HRQoL in the patients with the acute coronary syndrome still remain a controversy. Namely, several studies that dealt with this problem did not relate the presence of risk factors to worse HRQoL [23, 24]. Several publications, on the contrary to these findings, documented that HRQoL became reduced with the presence of risk factors for the coronary artery disease [20]. Also, Dias et al. [17] reported that diabetes, arterial hypertension and loneliness were predictors for the decreased physical component score in the patients with the acute coronary syndrome. Similarly to the finding of Dias et al. [17], this study demonstrates that diabetes mellitus is a predictor for decreased HRQoL.

The explanation for these findings lies in the fact that the presence of these condition may inhibit many normal physical functions; these patients have increased subjective health complains of musculoskeletal, neurological and gastrointestinal pains [25]. Gardner and Montgomery [26] assessed that the patients with this comorbidity had decreased claudication distances, physical function and HRQoL. An impairment of circulation underlines all these conditions and results in pain when physically active, promoting the sedentary lifestyle.

According to some investigators, socio-economic factors seem to have great impact on HRQoL. Therefore, the assessment of the influence of selected socioeconomic variables on HRQoL is an important element of this study. Namely, according to the findings of this study, a low economic status seems to be a strong predictor for impaired HRQOl, because it negatively affected the PCS and MCS. The findings of this study are in accordance with the claims of several other studies that also demonstrated that a poor way of living negatively influences HRQoL [9, 27]. Besides the previously mentioned, our study demonstrated that poor HRQoL was also exhibited by the lonely people. This was also proved by the studies of Jankowska-Polańska et al. [20] and Lane et al. [28] who showed that loneliness turned out to be an independent predictor for HRQoL.

During the last couple of decades, the treatment of STEMI was greatly improved, especially by introducing pPCI, which in turn drastically reduced morbidly and mortality. Previous reports suggested a potential impact of comorbidities on survival after pPCI. These comorbidities are: low ejection fraction, renal insufficiency, Killip class, final thrombolysis in myocardial infarction (TIMI) flow, three vessel disease, and anterior infarction [29, 30]. However, it has not been confirmed if these clinical parameters have an impact on HRQoL. Even if it is to be expected that these parameters may have an impact on HRQoL, this study did not confirm these suppositions because it was found that none of the clinical parameters for severity of STEMI affected HRQoL. Similar to these results are the findings of several other studies that found characteristics related to the severity of myocardial infarction not to be a significant predictor of HRQoL [21, 31]. Beside the previously mentioned, this study demonstrated that the presence of previous cerebrovascular insult negatively affected HRQoL among the patients with STEMI. These findings are in accordance with previous studies that also demonstrated that previous cerebrovascular events had a significant impact on HRQoL [7, 18].

A limitation of this study is that the data represent findings from the group of patients from a single PCI center and not from a multiple different centers. Another limitation is the fact that HRQoL was not measured at baseline at the time of examination of coronary angiography due to the urgency of the procedure. Furthermore, the small size of some variables limits the ability to conduct the stratified analyses. So, the results of this study need to be confirmed in multicenter studies.

Conclusion

The results of the present study have demonstrated that besides gender and age, diabetes mellitus and some socioeconomic parameters had a significant impact on HRQoL in the patients after surviving STEMI. Apart from the treatment of risk factors for coronary artery disease, a social support may be amenable to interventions and could improve HRQoL in the patients with STEMI. Taking into account differences in age, gender and socioeconomic status may be necessary when planning the intervention strategies (treatment and/or rehabilitation) to improve the effectiveness of secondary prevention.

Acknowledgments

The author wishes to thank all patients who participated in this study and to all staff of the Clinical Centre of Serbia who helped in collecting and processing data.

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Received on October 11, 2017.
Accepted on October 31, 2017.
Online First November, 2017.