

Smoking And Quality Of Life After Acute Myocardial Infarction

Esad Pepic¹, Amela Dzubur², Alen Dzubur³, Mirza Dilic⁴, Jasmin Musanovic⁵, Emina Kurtagic Pepic⁶, Damir Secic¹, Amna Pleho Kapic¹, Almir Fajkic¹

¹Department of Pathophysiology, Medical Faculty, University of Sarajevo, Bosnia and Herzegovina

² Department of Social medicine, Medical Faculty, University of Sarajevo, Bosnia and Herzegovina

³ Clinic of Heart Diseases and Rheumatism, Clinical Center Sarajevo, Bosnia and Herzegovina

⁴ Institute of Vascular Diseases, Clinical Center Sarajevo, Bosnia and Herzegovina

⁵ Department of Biology and Human Genetic, Faculty of Medicine, University of Sarajevo, Bosnia and Herzegovina

⁶ Ministry of Health of Canton Sarajevo, Bosnia and Herzegovina

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Abstract

Objectives: To examine and compare the quality of life (QoL) of patient with *Acute Myocardial Infarction* and healthy individuals. Furthermore to investigate the influence of tobacco smoking on QoL of these groups.

Material and Methods: A total of 200 subjects were recruited for this study, one hundred of these were smokers and rest was non-smokers. Further sub-classification was done on the basis of the AMI. SF-36 was used to evaluate the QoL the quality of life among the smokers and non-smokers with and without the incidence of AMI. Data analysis was done using Statistical Package for Social Sciences SPSS version 13®.

Results: Findings demonstrate a clear relation to the average QoL scores among smokers and nonsmokers. Non-smokers were found to have statistically significant differences (SSD) in QoL with and without the incidence of AMI. High QoL score was observed among healthy non-smokers. With increasing age of smokers, it is seen that there is a decrease in scores on all subscales of quality of life, and the value difference scores were statistically significant ($p < 0.05$).

Conclusion: Smoking significantly affects the QoL of patients with AMI. This effect was more pronounced with age. Marital status was found to affect the physical functioning, vitality and mental health of the subjects

Key words:

Tobacco smoking, Acute coronary syndrome, Quality of life, SF-36.

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*Corresponding Author:

Dr. Esad Pepic

Department of Pathophysiology, Cekalusa 90 Faculty of Medicine, University of Sarajevo, 71000 Sarajevo Bosnia and Herzegovina Phone: 00387 62 216 151

Email: epepic@gmail.com

Introduction

Acute coronary syndrome (ACS) includes a spectrum of clinical presentations which, according to clinical findings, electrocardiography image of the ST segment and cardiac enzymes specific findings can be viewed as an acute myocardial infarction (AMI) with ST elevation (STAMI), AMI without ST elevation (NSTAMI) and as unstable angina pectoris (UAP) [1].

Tobacco use is one of the most important causes of AMI globally, especially in men [2]. In developed countries population levels of smoking among men has reached its peak and began to decline while in women it continues to grow [3,4,5]. In 2002 about 20% of young teenagers around the world (from 13 to 15 years), consumed tobacco [6]. Among them 80,000 to 100,000 start smoking every day, and nearly half of them live in Asia. Half of those who start smoking in their adolescent years continue to smoke for the next 15 to 20 years. World Health Organization has stated that most of diseases and premature mortalities are due to tobacco disproportionately affects the poor population. In spite of these affects the abuse of tobacco began to grow by 3.4% since 2002 [7]. Smoking is undoubtedly an independent risk factor for cardiovascular disease, whose influence is growing in proportion to the number of cigarettes. According to the Framingham study, the relative risk of ischemic stroke was 1.7 in the conditions when other risk factors are under control where the "heavy" smokers (more than 40 cigarettes a day) have two times higher risk than the "light" smokers (10 cigarettes a day) [8,9]. It has been found that smoking accelerates atherosclerosis. Other mechanisms by which smoking can cause the occurrence of vascular disease include increased blood viscosity, hypercoagulability state, elevated serum fibrinogen levels, increased platelet aggregation and increased blood pressure.¹⁰ Smoking cessation does not change immediately the risk of cardiovascular disease, which is approaching or is equal to the risk of those who never smoked after 2-5 years of abstinence [9,10,11,12].

Quality of life is a broad term that refers to the total well-being of the individual in terms of physical, psychological, emotional, mental and social well-being, and which is in turn influenced by numerous factors including age, gender, socioeconomic status, risk factors in behavior, the environment and the absence or presence of disease. Quality of life means, above all, enabling people to achieve their goals and to choose their ideal lifestyle, as much as possible [13,14].

In general, the quality of life refers to the combination of external conditions and personal characteristics by which an individual is experiencing pleasure and displeasure, plans to preserve or change the circumstances in which lives [13]. It is a broad concept, which consists of individual physical health, psychological status, material independence and their relationship to important characteristics of environment. Taking these characteristics, the European Foundation for the Improvement of Living and Working Conditions (EFILWC) produced the first review of quality of life (EQOL) in the summer of 2003 which included 28 EU countries (15 EU countries, 10 countries that meanwhile joined the EU - NMS and 3 candidate - DC3) [14]. Chosen are 6 key areas of quality of life:

- **Employment;**
- **Economic resources;**
- **Family and household;**
- **Family life and social role;**
- **Health and health care; and**
- **Knowledge, education and training.**

Study goal

The goal of the study was to assess the quality of life of people who have acute coronary syndrome, and compare the quality of life of healthy individuals. The paper investigates the influence of tobacco smoking on quality of life of these groups of subjects.

Material and Method

The time frame of research was from January 2007 and February 2010 on Clinic of Neurology, Clinical Centre University of Sarajevo. A total of N=200 were the part of this study, which were further divided in to two groups. First group were regular smokers -100 subjects (67 males and 33 females), while the second group consists of 100 non-smokers (36 males and 64 females). Average age was 55. 8 [SD ± 13.7] years. In both observed groups in 50% of respondents verified is acute myocardial infarction (71 males and 29 females), and 50% were healthy (32 males and 68 females). The inclusion criteria for both groups are as follow:

First group were:

- Continuous tobacco smoking for the last 10 years;
- Voluntary consent to participate in the research;
- The average number of 20 cigarettes smoked per day;
- Age between 40 and 80 years
- Not taking other narcotic substances.

Second group were:

- Nonsmokers;
- Voluntary consent to participate in research;
- Age between 40 and 80 years;
- Respondents who had never smoked tobacco;
- Not taking other narcotic substances.

Acute myocardial infarction was diagnosed with ECG and

laboratory determination of troponin in the blood. Subjects with AMI were recovered from AMI 1-3 years ago and use in the treatment coronary vasodilators. The research did not include patients who underwent bypass surgery or other invasive therapeutic methods.

Study tool:

The study used a questionnaire designed for the purpose of research that is designed for self-reporting. The questionnaire was made on the basis of:

- Questionnaire to examine the quality of life SF-36. [16,17]. Questionnaire SF-36 is designed to measure the 8 most important health dimensions using 8 groups of questions. Groups are comprised of 2-10 questions and the answers are offered to each question, which is subsequently processed as standard. SF-36 questionnaire has 36 questions, of which 35 questions were grouped into 8 dimensions:

- Physical functioning;
- Physical role;
- Physical pain;
- General health – vitality;
- Social functioning - emotional role;
- Mental Health.

Socioeconomic status of subjects was tested by EURO QoL questionnaire which covered the issues associated with socio-economic status of respondents and can be correlated with their quality of life. The questions that we used refer to gender of respondents, their age, environment (urban or rural), number of family members, level of education (less than 8 years, 8-12 years and more than 12 years), marital status (married, divorced, lives with partner, the total income, employment, occupation). Observed are variables age of subjects, sex, and marital status as factors that can influence the patient's quality of life.

Statistical analysis

All the data was analyzed using SPSS version 13 ®. For assessing the significance of difference i.e. the numerical analysis of variance – ANOVA was used. The statistical value for significance was set at $p < 0.05$.

Results

Analysis of average values of the quality of life scores between smokers and nonsmokers in relation to the presence of AMI shows that there are statistically significant differences in quality of life between smokers and nonsmokers. ($F=191.287$, $p < 0.001$) (Table 1). In the domain of opportunities to do different physical activities and degree of limitation in these activities during the day, higher average scores showed non-smokers who were without disease. Both among smokers and nonsmokers had higher scores persons without AMI. ($F=253.050$, $p < .001$). In terms of facing the problems in performing work and other regular activities the higher average scores showed non-smokers without AMI in relation to smokers and this difference was statistically significant ($F=180.050$ $p < 0.001$).

While discussing the vitality (feeling that things are going well) higher scores showed non-smokers without AMI in relation to smokers and the difference was statistically significant ($F=172.730$ $p < 0.05$). The same result was found when it comes to review of "mental

health", or what is meant by it in the questionnaire SF-36 ($F=88.899$ $p<0.001$). In the domain of social functioning - activities the non-smokers without AMI shows higher average score, compared to smokers with AMI and with statistically significant difference ($F=74.518$ $p<0.001$) (Table 1).

Analysis of the scores on individual subscales compared to the presence of heart disease and their smoking status, we can see that the disease associated with smoking significantly affects the quality of life (higher scores on all subscales) with fact that this difference is more pronounced in nonsmokers. Analysis of average values of the quality of life scores between smokers and nonsmokers living with AMI in relation to their gender shows that there are statistically significant differences between smokers and nonsmokers of both sexes only when it comes to physical functioning ($F=5.087$ $p=0.024$) and domain of physical pain ($F=10.264$ $p=0.001$) (Table 2).

In the domain of opportunities to do different physical activities and degree of limitation in these activities during the day, with the current health state higher average scores showed non-smoker with AMI of both sexes, but the difference was not statistically significant ($p=0.081$). However, evaluating vitality (feeling that things are going well) non-smokers with AMI showed higher scores when compared to smokers with AMI of both sexes but the difference was not statistically significant ($p=0.200$) Similar results were obtained when analyzing the field of mental health, social functioning, physical pain and general health (Table 2). In the group of smokers with AMI as well as non-smokers with AMI, men had higher scores than women with the exception of emotional role and mental health. Analysis of average values of the quality of life scores between smokers and nonsmokers with AMI in relation to their age shows that there are statistically significant differences ($F=258.96$ $p<0.001$) at all scales of quality of life (Table 3).

With increasing age of smokers, it is seen that there is a decrease in scores on all subscales of quality of life, and the value difference scores were statistically significant ($p<0.05$). Analysis of average values of the quality of life scores between smokers and nonsmokers with AMI in relation to their level of education shows that there are statistically significant differences between smokers and nonsmokers with the same level of education ($p=0.000$) (Table 4). Analyzing the scores for individual dimensions of quality of life in relation to marital status between smokers and nonsmokers suffering from AMI, we can see that significant differences exist on the subscales of physical functioning ($F=4.627$ $p=0.032$), vitality ($F=4.129$ $p=0.043$) and mental health ($F=5.802$ $p=0.016$) (Table 5). Also among non-smokers higher scores in almost all subscales had subjects who do not live in a marriage than those who live in a marriage but the resulting difference is not statistically significant ($p>0.05$).

Discussion

Smoking is undoubtedly an independent risk factor for cardiovascular disease, whose influence is growing in proportion to the number of cigarettes smoked. In addition, smoking affects the quality of life both in healthy and in patients with AMI [2,12,13,21,23]. The current study showed that in the average quality of life scores between smokers and nonsmokers, according to the presence of cardiovascular disease, there are significant differences in quality of life between smokers with and without AMI as well as smokers

and nonsmokers with and without AMI. Of course as expected, the highest average scores showed healthy non-smokers. There are also significant differences in average scores of quality of life between smokers and non-smokers, regardless of the presence of AMI. In addition, our research has shown that smoking decreases the quality of life of patients with AMI.

Strandberg Y et al., found that there is no significant difference in the quality of life between smokers and nonsmokers in almost all subscales. The sample was homogenized with regard to socio-economic characteristics so that we could not exclude the influence of socioeconomic factors on quality of respondents' life [18]. Our study took into account these characteristics and was done by comparison of quality of life in relation to the age of the respondents, their gender, level of education and marital status but moreover, is considered the quality of life in relation to health and disease.

Average value of quality of life scores in our study between smokers and nonsmokers with AMI in relation to their age shows that there are significant differences on all scales of quality of life with increasing age of smokers is decreasing scores on all subscales of quality of life ($p<0.001$). This result is consistent with researches by Beck C. et al. and Bernd Schweikert et al. who found that in patients after acute myocardial infarction, age and psychosocial factors are important predictors of quality of life [23,24].

Analysis of average values of the quality of life scores between smokers and nonsmokers living with AMI in relation to their gender shows that there are significant differences between smokers and nonsmokers of both sexes only when it comes to physical functioning ($p=0.024$) and physical pain ($p<0.001$). Other studies have shown that there are gender differences when it comes to certain subscales of quality of life as physical functioning, bodily pain and mental health [18,19].

Our study show that the average quality of life scores between smokers and nonsmokers with AMI in relation to their level of education shows that there are statistically significant differences between smokers and nonsmokers of the level of education ($p<0.001$), with generally higher scores of respondents with highest education. Carla Costa Dias et al., in their study showed that the best quality of life scores have younger smokers, males with more than 12 years of education [19].

Conclusion

Smoking significantly affects the quality of life of patients with acute myocardial infarction. The current study provides evidence that there is a significant difference in the quality of life scores between smokers and nonsmokers' suffering from AMI, this effect was more pronounced with age. However, marital status of the subjects was found to be affecting the quality of life on the subscales of physical functioning, vitality and mental health.

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Conflict of Interests:

Authors have no Conflict of Interest

Table 1 Quality of life in relation to smoking status and the presence of AMI

		Smokers				F	p
		Yes		No			
		With AMI	Without AMI	With AMI	Without AMI		
Physical functioning	Mean	53.71	82.12	58.72	87.52	253.786	<0.001
	SD	27.07	21.33	26.68	20.30		
Physical role	Mean	3.16	4.22	3.04	4.39	180.050	<0.001
	SD	1.06	1.00	1.06	0.84		
Emotional role	Mean	3.34	4.11	3.44	4.38	84.261	<0.001
	SD	1.08	1.01	1.14	0.85		
Vitality	Mean	44.76	60.99	44.88	67.28	172.730	<0.001
	SD	14.04	14.55	16.48	13.32		
Mental health	Mean	51.94	61.27	59.91	66.02	88.899	<0.001
	SD	13.92	15.02	16.22	13.42		
Social functioning	Mean	60.69	74.21	57.70	80.14	74.518	<0.001
	SD	25.89	21.76	26.02	20.66		
Physical pain	Mean	66.53	81.33	67.47	86.33	103.907	<0.001
	SD	27.66	22.93	28.76	19.28		
General health	Mean	40.89	64.75	40.29	71.33	295.275	<0.001
	SD	20.09	16.41	19.78	15.48		

(p<0.005) (AMI- acute myocardial infarction)

Table 2 Quality of life in smokers and nonsmokers with AMI in relation to sex

		PATIENTS WITH ACUTE MYOCARDIAL INFARCTION				F	p
		Smokers		Non smokers			
		Male	Female	Male	Female		
Physical functioning	Mean	77.80	74.70	79.77	73.03	5.087	0.024
	Std. deviation	23.74	26.86	26.13	30.16		
Physical role	Mean	4.05	3.95	4.11	3.98	3.059	0.081
	Std. deviation	1.06	1.13	1.06	1.12		
Emotional role	Mean	3.94	3.96	4.22	4.00	1.207	0.272
	Std. deviation	1.07	1.07	.98	1.08		
Vitality	Mean	57.77	57.50	60.30	57.13	1.648	0.200
	Std. deviation	15.11	16.61	16.50	16.92		
Mental health	Mean	58.39	60.27	60.93	61.87	1.209	0.272
	Std. deviation	15.08	15.42	15.38	16.66		
Social functioning	Mean	73.75	69.08	74.75	72.67	3.136	0.077
	Std. deviation	21.81	24.52	25.02	23.99		
Physical pain	Mean	82.23	74.32	80.58	75.53	10.264	0.001
	Std. deviation	21.50	26.98	24.63	26.95		
General health	Mean	60.97	58.67	64.17	60.70	3.018	0.083
	Std. deviation	17.92	21.40	21.72	22.02		

Table 3 Quality of life in smokers and nonsmokers with AMI in relation to age

		PATIENTS WITH ACUTE MYOCARDIAL INFARCTION								F	p
		Smokers				Non smokers					
		41-50 yrs	51-60 yrs	61-70 yrs	71-80 yrs	41-50 yrs	51-60 yrs	61-70 yrs	71-80 yrs		
Physical functioning	Mean	89.27	86.07	72.47	57.20	96.00	89.33	69.07	51.20	258.969	<0.001
	Std. deviation	17.14	16.45	23.87	28.49	11.12	16.97	28.82	27.43		
Physical role	Mean	4.44	4.38	3.88	3.29	4.59	4.38	3.82	3.24	141.764	<0.001
	Std. deviation	0.89	0.98	1.12	0.98	0.78	0.85	1.09	1.10		
Emotional role	Mean	4.22	4.16	4.03	3.40	4.43	4.45	3.96	3.60	57.929	<0.001
	Std. deviation	1.04	0.94	1.10	1.00	0.81	0.80	1.07	1.17		
Vitality	Mean	61.73	59.73	59.13	49.93	64.60	63.40	53.60	53.27	48.418	<0.001
	Std. deviation	16.65	14.77	14.87	14.65	13.60	14.78	17.76	17.39		
Mental health	Mean	61.92	61.12	58.81	55.47	64.59	66.77	57.23	57.01	23.135	<0.001
	Std. deviation	17.75	12.95	16.01	13.27	13.79	14.59	16.96	16.39		
Social functioning	Mean	76.33	79.33	73.17	56.83	81.50	79.17	72.50	61.67	61.654	<0.001
	Std. deviation	22.28	19.11	23.58	21.58	19.86	22.64	25.17	25.36		
Physical pain	Mean	86.07	80.90	78.30	67.83	91.67	83.03	72.83	64.70	71.908	<0.001
	Std. deviation	21.02	22.01	25.54	26.51	14.68	20.90	27.03	30.10		
General health	Mean	68.80	67.27	57.20	46.00	76.67	67.20	55.13	50.73	152.903	<0.001
	Std. deviation	16.86	13.13	20.17	19.28	13.91	17.90	22.36	22.43		

Table 4 Quality of life in smokers and nonsmokers with AMI in relation to the education

	Education yrs.	PATIENTS WITH ACUTE MYOCARDIAL INFARCTION						F	p
		Smokers			Non smokers				
		8	8-12	12+	8	8-12	12+		
Physical functioning	Mean	55.41	78.71	82.60	56.38	73.64	91.36	113.306	<0.001
	Std. deviation	32.86	21.24	21.62	28.96	30.12	14.49		
Physical role	Mean	3.20	4.07	4.26	3.40	3.93	4.45	74.191	<0.001
	Std. deviation	1.19	0.98	1.04	1.26	1.06	0.80		
Emotional role	Mean	3.25	4.09	4.09	3.59	4.17	4.35	36.653	<0.001
	Std. deviation	1.26	0.92	1.05	1.19	0.94	0.94		
Vitality	Mean	49.29	58.74	60.00	51.15	58.84	63.05	33.483	<0.001
	Std. deviation	18.17	15.08	14.58	18.81	16.58	14.03		
Mental health	Mean	50.86	61.52	60.23	54.58	62.08	64.65	23.420	<0.001
	Std. deviation	15.62	13.84	15.77	16.27	16.22	14.47		
Social functioning	Mean	58.42	74.15	73.68	66.54	73.00	78.75	21.276	<0.001
	Std. deviation	26.56	21.68	21.96	27.16	25.27	20.71		
Physical pain	Mean	62.86	80.26	82.74	67.69	75.92	86.61	43.934	<0.001
	Std. deviation	29.14	23.50	21.23	29.53	25.49	21.10		
General health	Mean	48.47	60.78	63.80	53.00	59.40	71.45	54.210	<0.001
	Std. deviation	22.87	18.85	17.45	24.57	21.34	17.25		

Table 5 Quality of life of smokers and nonsmokers in patients with AMI in relation to marital status

		PATIENTS WITH ACUTE MYOCARDIAL INFARCTION												F	p
		Smokers						Non smokers							
		Married	Single	Divorced	Widowed	Living together	Other	Married	Single	Divorced	Widowed	Living together	Other		
Physical functioning	Mean	74.63	89.69	83.18	57.06	66.25	81.11	74.24	94.92	73.13	45.67	75.00	95.00	4.627	0.032
	SD	25.31	15.38	24.83	27.86	24.96	24.08	27.34	14.56	33.27	27.12	43.59	7.56		
Physical role	Mean	3.89	4.49	4.07	3.65	3.44	4.06	3.96	4.55	3.94	2.93	4.00	4.69	1.836	0.0176
	SD	1.12	.89	1.12	1.06	1.09	1.07	1.03	.78	1.43	1.09	2.00	.88		
Emotional role	Mean	3.90	4.21	4.00	3.68	3.83	4.04	4.08	4.50	4.00	3.34	4.33	4.50	1.098	0.0295
	SD	1.09	1.04	1.06	1.01	1.00	.95	.99	.81	1.20	1.28	1.33	.71		
Vitality	Mean	57.33	60.86	58.64	52.50	51.25	61.67	58.57	66.54	46.88	45.67	53.75	61.88	4.129	0.043
	SD	15.66	17.01	16.60	14.42	18.87	10.61	16.13	13.92	18.70	17.06	24.62	9.23		
Mental health	Mean	59.80	59.63	60.36	56.94	53.00	58.67	61.49	67.57	46.50	53.47	54.00	57.50	5.802	0.016
	SD	14.46	17.19	19.39	15.19	17.09	12.65	15.95	13.10	11.30	18.45	10.07	13.68		
Social functioning	Mean	72.05	74.22	71.59	62.50	65.63	75.00	72.97	83.65	65.63	56.25	84.38	78.13	3.519	0.061
	SD	23.81	22.03	18.62	24.03	11.97	24.21	24.05	18.08	36.44	25.80	31.25	22.90		
Physical pain	Mean	77.51	85.27	90.00	68.16	56.25	77.22	75.68	91.58	80.63	58.50	74.38	95.94	1.414	0.235
	SD	25.72	19.04	15.57	24.98	36.88	24.60	25.29	15.90	31.07	31.58	35.08	5.66		
General health	Mean	58.57	67.03	62.73	48.97	65.00	68.33	59.14	77.69	54.38	45.83	68.75	81.88	0.033	0.856
	SD	21.03	14.77	19.67	18.04	7.07	12.25	19.88	13.81	33.64	23.64	36.60	13.35		

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