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DIFFERENCES IN QUALITY OF LIFE AFTER STROKE AND MYOCARDIAL INFARCTION

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SUMMARY

***Introduction**: There is obvious decline in quality of life after MI and stroke. The main factors that reduce quality of life in these patients were the inability of returning to normal activities, pain and the development of depression / anxiety. We wanted to know what has the biggest influence on recovery and differences in quality of life in patients after stroke and heart attack.*

***Subjects and Methods**: Cross-sectional study was conducted using HADS and WHOQOL-Bref questionnaire. Criteria for exclusion were diabetes, previous depression, cancer or other co morbidities that influenced the quality of life. It has been surveyed total of 396 patients, of whom 378 patients satisfied the criteria of inclusion in the study. Based on the personal data of patients, they were divided according to gender, age, educational level, and social support expressed by number of members with whom patient lives.*

***Results**: In all the observed parameters of the SU group had better results than the stroke group. The recovery after a stroke affected age, length of education and depression. Age, gender and length of education influence on a heart attack recovery. Disease duration did not affect the quality of life in either group. Significantly more patients after a stroke had depression compared to MI ($p<0.001$). Anxiety was not found significant in differences between groups ($p=0.051$). Metabolic syndrome was more frequent in the stroke group, but the difference between groups was not significant (stroke/MI) ($p=0.098$). In the group of stroke patients who had MS patients more often had depression ($p=0.003$) for different of respondents from the group with MI.*

***Conclusion**: Quality of life was significantly worse in patients after stroke compared to those with MI. The recovery from stroke was most significantly impacted by depression and age and level of education, while the recovery from heart attack was at most affected by gender, age and level of education.*

Key words: *stroke - myocardial infarction - quality of life – depression - anxiety*

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INTRODUCTION

Quality of life is an important aspect of health outcome, along with duration of life, and it is of interest as a determinant of outcome as well (Visser et al. 1995). Quality of life (QOL) is increasingly being used as an outcome measure in clinical trials and observational studies designed to evaluate the quality of care for patients with stroke (Carod-Artal et al. 2000), like after acute myocardial infarction (AMI) (Beck et al. 2001).

Reducing the quality of life was reported even in patients with minimal consequences of stroke (Kranciukaite & Rastenyte 2006). There are numerous factors that act jointly to reduce the quality of life in patients after stroke. Age, severity of the deterioration of motor paralysis, lack of social support, inability to return to work, impaired cognition, presence of co morbidity (Kranciukaite & Rastenyte 2006), low or unstable incomes, lack of freedom, the low quality of the environment (Guyatt et al. 1993) can be combined to reduce the quality of life, and should be taken into consideration when analyzing the results after the stroke (Kranciukaite & Rastenyte 2006, Guyatt et al. 1993). Some studies bring the strong connection between physical disability, dependence in activities of daily functioning and quality of life (Kranciukaite & Rastenyte 2006). Dependence in activities of daily functioning showed a significant association with physical functioning and general health dimensions of quality of life, but not in the psychological and socio-economic aspects of quality of life (Kranciukaite & Rastenyte 2006). Patients with stroke may be damaged in many aspects of life (Lynch et al. 2008, Nichols-Larsen et al. 2005), which affects the physical, psychological and social dimensions of quality of life (Widar et al. 2004, Béthoux et al. 1999). Despite a good neurological recovery of a large number of patients do not reach the original quality of living and quality of life they had before the stroke (Jonkman et al. 1998). In patients with stroke survivors with residual neurological deficit, of crucial importance to the recovery in the first 3 to 6 months, very rarely it can last continuously for one year (Vidović et al. 2007). Quality of life after stroke is an important outcome of health care, which is not getting enough attention in the literature.

Several clinical studies show decreasing in social, physical and psychological functioning after myocardial infarction (Simpson & Pilote 2005), which is reflected in a significant decrease of quality of life (Schweikert et al. 2009), regardless of the treatment carried out in patients after AMI (Beck et al. 2001). Comparing with the general population, the main disturbances occur in the dimension pain / discomfort, usual activities, primarily in the development of anxiety / depression.

Relative deterioration, comparing with the general population, decreases with age (Schweikert et al. 2009).

The aim was to identify and compare factors affecting quality of life after stroke and sfter myocardial infarction.

SUBJECTS AND METHODS

We conducted a cross-sectional study using the HADS questionnaire survey (Zigmond & Snaith 1983) and WHOQOL-Bref (Pibernik-Okanović 2001) questionnaire in the period from September 2008-August 2009. Inclusion criteria were first ischemic stroke or heart attack, while exclusion criteria were diabetes, previous depression, cancer or other co morbidities that influenced the quality of life. It has been surveyed total of 396 patients, of whom 378 patients satisfied the criteria of inclusion in the study. On the basis of demographic data, respondents were divided according to age, gender, duration of education, and length of illness, and social support as expressed by the number of household members with whom patient lives. Survey was conducted by some of the members of the team (doctor or nurse) at the outpatient clinic or patients home. After a survey, we did laboratory tests on which we have evaluated the metabolic syndrome. As criteria for MS were used ATP III criteria (Deen 2004).

Collected data were statistically analyzed using the methods of descriptive statistics (mean - M, standard deviation - SD, median - ME, interquartile range - IR range - R), and required tests were performed to verify the hypothesis (Mann-Whitney test, t-test, $\chi 2$ test, Fisher's exact test, analysis of variance (ANOVA, Tukey test, Dunnettov C test), and alpha coefficient. In the event of statistically significant differences among multiple groups (ANOVA) was performed post hoc analysis to examine between these groups (pairs of groups) there is a difference, and all significant differences were found at $p < 0.001$.

Taken as the significance level was $p<0.050$. P values that can not be expressed to a maximum of three decimal places are shown as $p<0.001$ (Petrovečki 2000).

There were 235 (62.2%) males and 143 (37.8%) females. The average age of all subjects was 69.5 ± 17 years (ME ± IR). The youngest respondent was 35, the oldest 92, with a range of 57 years. The average age of the stroke group was 72 ± 13 (ME±IR) years, and MI group was 64 ± 16 (ME±IR) years. Respondents who have survived a stroke were significantly older than patients who survived a heart attack ($U = 10492.500$, $p<0.001$, Mann-Whitney U test).

RESULTS

Demographic differences among respondent observed groups are shown in Table 1. Quality of life was significantly better rated in the group of patients with myocardial infarction compared with those after stroke. Average rating of quality of life in the group MI was 3.5, and 2.9 in stroke group ($t=-7.288$, $p<0.001$). Satisfaction with health was also rated better in the group MI (3.3) in relation to the CS (2.7) ($t=-6.398$, $p<0.001$). Depending on gender, we did not find significant differences between men and women ($t=1.263$, $p=0.208$) for the quality of life, as well as for health satisfaction ($t=0.585$, $p=0.559$).

Table 1. Demographic characteristics of patients

		stroke	MI	test
Gender	Male	112 (55.4)	123 (69.9)	χ^2=8.339; df=1;p=0.004
	Female	90 (44.6)	53 (30.1)	
Age	<50	6 (3.0)	16 (9.1)	χ^2=33.377; df=2; p<0.001
	50 – 64	37 (18.3)	71 (40.3)	
	≥65	159 (78.7)	89 (50.6)	
Lenght of education (year)	≤12	166 (82.2)	124 (70.5)	χ^2=7.238; df=1; p=0.008
	>12	36 (17.8)	52 (29.5)	
Lenght of illnes (year)	<1	104 (51.5)	85 (48.3)	χ^2=0.383; df=1; p=0.606
	≥3	98 (48.5)	91 (51.7)	
Number of houshold members	A	20 (9.9)	22 (12.5)	χ^2= 4.854; df= 2; p=0.088
	B	170(84.2)	151 (85.8)	
	C	12(5.9)	3(1.7)	

MI – Myocardial infarction; A – lone; B – in house; C - collective

In the MI group, men were more satisfied with the quality of life than women ($t=2.485$, $p=0.014$) and health satisfaction ($t=2.185$, $p=0.008$). In the stroke group, <50 years were significantly more satisfied with the quality of life compared to subjects ≥ 65 years ($F=4.589$, $p=0.011$). Differences in health satisfaction were not significant among respondents, depending on age ($F=1.994$, $p=0.139$). In the group of MI differences in quality of life there was was no significance among respondents, depending on age ($F=2.252$, $p=0.108$), as opposed to satisfaction with health, where patients <50 years were significantly more satisfied with health in relation to patients ≥ 65 years ($F=5.372$ $p=0.005$). The duration of education had the impact on quality of life in stroke group and the group of MI. In both groups of respondents who were educated for more than 12 years

were more satisfied with the quality of life: CS (t=-3.151, p=0.002), MI (t=-4.120, p<0.001). This parameter did not influence the satisfaction of health or the stroke group (t=-1.014, p=0.312) nor in the group SU (t =-1.884, p = 0.061). The difference in quality of life in the stroke group dependant on social support as expressed in the number of household members with whom respondent lives has not proved significant (F=1.052, p=0.351), nor health satisfaction (F=1.736, p=0.179). Social support did not affect either the quality of life in the group MI (F=0.796, p=0.453), nor health satisfaction (F=1.942, p=0. 147).

The subjects of the group MI assessed the quality of life by domains better than those in group of stroke. The differences for all domains were significant between groups. (Physical: t=-9.543, p<0.001; Psychological: t=-7.175, p<0.001; Social: t=-4.047, p<0.001; Domain environment: t=-5.615, p<0.001).

Table 2. Differences in quality of life between CS and MI group by gender. age and duration of education and number of members houshold

			domain 1		domain 2		domain 3		domain 4	
			M	SD	M	SD	M	SD	M	SD
Gender	Stroke	Male	47.0	22.3	53.3	18.8	60.7	19.6	55.8	18.7
		Female	40.3	22.2	46.7	20.9	63.3	19.8	52.6	13.9
		test	t=2.127; p=0.035		t=2.354; p=0.020		t=-0.914; p=0.362		t=1.419; p=0.157	
	Myocardial infarction	Male	66.7	16.3	67.2	15.4	69.6	15.9	66.9	15.4
		Female	57.0	19.3	56.9	19.4	69.5	20.7	57.5	18.4
		test	t=3.400; p=0.001		t=3.427; p=0.001		t=0.037; p=0.971		t=3.489; p=0.001	
Age	Stroke	<50	72.7	9.9	73.2	8.6	68.2	14.1	68.0	10.2
		50 – 64	52.4	20.2	54.4	16.7	57.8	19.2	55.3	16.6
		≥65	41.0	22.1	48.5	20.4	62.6	19.9	53.6	16.8
		test	F=9.696; p<0.001		F=5.589; p=0.004		F=1.190; p=0.306		F=2.212; p=0.112	
	Myocardial infarction	<50	72.3	17.9	70.9	19.3	73.9	14.0	70.6	19.0
		50 – 64	68.0	14.7	66.3	15.5	70.3	14.4	66.6	16.1
		≥65	58.8	18.6	61.1	17.8	68.3	20.0	60.9	16.6
		test	F=7.920; p=0.001		F=3.285; p=0.040		F=0.795; p=0.453		F=3.658; p=0.028	
Duration of education (year)	Stroke	≤12	42.2	22.5	48.2	19.7	61.8	19.8	52.9	16.2
		>12	52.3	20.5	60.2	18.8	62.2	19.3	61.0	17.9
		test	t=-2.475; p=0.014		t=-3.356; p=0.001		t=-0.116; p=0.908		t=-2.657; p=0.009	
	Myocardial infarction	≤12	61.8	19.0	61.4	18.4	67.6	18.8	60.8	17.1
		>12	68.4	13.4	70.6	12.4	74.4	12.5	72.0	13.6
		test	t=-2.604; p=0.010		t=-3.867; p<0.001		t=-2.799; p=0.006		t=-4.602; p<0.001	
Number of houshold members	Stroke	A	52.6	21.4	54.7	22.7	65.9	24.1	56.5	19.3
		B	44.1	22.0	50.7	19.2	60.9	18.8	54.9	16.1
		C	27.9	23.2	37.0	22.0	67.7	22.9	42.5	17.0
		test	F=4.719; p=0.010		F=3.254; p=0.041		F=1.141; p=0.322		F=3.360; p=0.037	
	Myocardial infarction	A	62.0	18.9	62.0	18.9	73.1	18.7	61.9	18.7
		B	64.1	17.8	64.6	17.1	69.1	17.3	64.6	16.6
		C	50.0	15.7	50.0	8.0	66.6	14.4	53.3	13.4
		test	F=0.962; p=0.384		F=1.239; p=0.292		F=0.543; p=0.582		F=0.871; p=0.420	

Within the group of patients with stroke, shorterly ill patients evaluated quality of life by an average score of 2.8, and longer ill patients by 2.9 (t=-0.545, p=0.586). Health satisfaction are equally evaluated by patients in both of group by length of illness (t=-0.559, p=0.576). In the control group no significant difference was shown either for the quality of life (t=0.684, p=0.495), nor for the health satisfaction (t=1.739, p=0.084). In evaluating the quality of life by domains, in the group with stroke within a year there was a better result for the social domain compared to those who are ill for longer (t=2.076, p=0.039). For the physical domain (t=0.366,

p=0.715), psychological domain (t=0.474, p=0.636) and environment domain (t=1.393, p=0.165) there were no statistically significant differences. In relation to the length of illness, a group of subjects with a history of MI, the differences were not statistically significant for any domain (physical t=1.922, p=0.056; psychological t=1.282, p=0.201; social t=1.756, p=0.081; environment domain t=0.775, p=0.440).

Table 2 shows the difference in quality of life domains in relation to gender, age, length of education and social support of family members with whom the respondent lives. The prevalence of depression in the stroke group was significantly more frequent than in the group SU (χ^2=30.942, df=2, p<0.001). As many as 50% of stroke group had clinical depression, while 23.3% of subjects had borderline depression. In the group patients with MI had 27.3% clinical depression, and 18.8% were borderline cases. The difference in the prevalence of anxiety among the groups was not significant (χ^2=3.047, df=2, p=0.218). Social support expressed by the number of household members in the stroke group had not significantly affected on prevalence of depression (χ^2=7.648, df=4, p=0.105), nor in the group of MI (χ^2=6.567, df=4, p=0.161). Also, social support did not significantly affect on differences between subjects in the prevalence of anxiety in both of the stroke groups (χ^2=6.430, df=4, p=0.169), nor in the group of MI (χ^2=3.914, df=4, p=0.418). Among patients with clinical depression, depending on the length of illness, 55 (54.5%) were in the group of shorter illness patients (one year or shorter), and 46 (45.5%) patients in group of longer illness (three years or longer) (χ^2=0.802, df=1, p=0.371). Estimating relationships within the group of MI, depending on the length of illness, of 48 depressed patients, 24 (50.0%) were in the group of shorter illness patients, and 24 (50.0%) patients in the group of longer illness (χ^2=0.000, df=1, p=1.000).

Table 3. Difference between patients by gender. age. duration of education. and social support in SC and MI groups

	groups	Parameters	Number (%) of respodents	test	
Gender	CS+MS N_1=157 (100%)	Male	83 (52.9)	χ^2=0.516; df=1; p=0.473	χ^2=5.579; df=1; p=0.018
		Female	74 (47.1)		
	MI+MS N_2=129 (100%)	Male	86 (66.7)	χ^2=14.333; df=1; p<0.001	
		Female	43 (33.3)		
Age	CS+MS N_1=157 (100%)	<50	6 (3.8)	χ^2=140.650; df=2; p<0.001	χ^2=25.083; df=2; p<0.001
		50 – 64	30 (19.1)		
		≥65	121 (77.1)		
	MI+MS N_2=129 (100%)	<50	15 (11.6)	χ^2=29.023; df=2; p<0.001	
		50 – 64	51 (39.5)		
		≥65	63 (48.8)		
Duration of education (year)	CS+MS N_1=157 (100%)	≤12	128 (81.5)	χ^2=62.427; df=1; p<0.001	χ^2=3.590; df=1; p=0.058
		>12	29 (18.5)		
	MI+MS N_2=129 (100%)	≤12	93 (72.1)	χ^2=25.186; df=1; p<0.001	
		>12	36 (27.9)		
Number of houshold members	CS+MS N_1=157 (100%)	A	18 (11.5)	χ^2=178.331; df=2; p<0.001	χ^2=2.743; df=2; p=0.254
		B	131 (83.4)		
		C	8 (5.1)		
	MI+MS N_2=129 (100%)	A	17 (13.2)	χ^2=159.209; df=2; p<0.001	
		B	110 (85.3)		
		C	2 (1.6)		

The difference in evaluating the quality of life in depressed patients after stroke (2.4) was significantly lower compared with the quality of life after a myocardial infarction (2.9) (t=-4.408, p<0.001). The difference in health satisfaction in depressed patients with stroke (2.2) and MI (2.7) was also statistically significant (t=-3.971, p<0.001).

Differences in quality of life and health satisfaction were statistically significant in anxious patients after stroke and after MI. The average score for quality of life in patients with stroke was 2.3 and 2.9 in patients with MI (t=-4.036, p<0.001). The average rating of satisfaction of health in anxious patients with stroke was 2.1, while patients with MI rating was 2.8 (t=-3.911, p<0.001).

In both groups, a group of stroke and heart attack there were three quarters of patients that had MS. Metabolic syndrome, had 286 respondents, of whom 157 (54.9%) had stroke, and 129 (45.1%) had MI (χ^2=2.741, df =1, p=0.098). In Table 3 shows the

difference in the prevalence of metabolic syndrome among groups depending on gender, age, duration of education, and social support expressed by number of household members with whom the respondent lives.

Our research has confirmed a significant association between depression and metabolic syndrome. Of 149 depressed patients from both groups, 105 (70.5%) had metabolic syndrome, of which 72 in stroke group and 33 in MI group. In the group of stroke patients who have MS, clinical depression was significantly more frequent than in those without depression. In the group of heart attack patients who had MS were not depressed. The difference among respondents was significant, as shown in Table 4. Anxiety cannot result in a significant relationship with the metabolic syndrome in our study. The difference between the study groups was not significant (Table 4).

Table 4. Differences between SC i MI groups in level of depression and anxiety

	Groups	Score	Number (%) of respodents	Test	
Depression	CS+MS	<8	46 (29.3)	χ^2=11.554;	χ^2=20.344; df=2; p<0.001
	N_1=157	8 – 10	39 (24.8)	df=2;	
	(100%)	≥11	72 (45.9)	p=0.003	
	MI+MS	<8	71 (55.5)	χ^2=28.093;	
	N_2=129	8 – 10	25 (19.4)	df=2;	
	(100%)	≥11	33 (25.6)	p<0.001	
Anxiety	CS+MS	<8	89 (56.7)	χ^2=39.146;	χ^2=1.460; df=2; p=0.482
	N_1=157	8 – 10	30 (19.1)	df=2;	
	(100%)	≥11	38 (24.2)	p<0.001	
	MI+MS	<8	66 (51.2)	χ^2=18.465;	
	N_2=129	8 – 10	32 (24.8)	df=2;	
	(100%)	≥11	31 (24.0)	p<0.001	

Table 5. Parameters of Metabolic syndrome according to level of depression and anxiety in Stroke group and Myocardial infarction group

		Depressio - number (%) of respodents				Anxiety- number (%) of respodents			
		<8	8 – 10	≥11	test	<8	8 – 10	≥11	test
BGL	CS	19 (28.8)	15 (22.7)	32 (48.5)	χ^2=3.395;	39 (59.1)	9 (13.6)	18 (27.3)	χ^2=3.887;
	MI	19 (43.2)	11 (25.0)	14 (31.8)	df=2; p=0.183	19 (43.2)	12 (27.3)	13 (29.5)	df=2; p=0.143
TG	CS	34 (24.8)	35 (25.5)	68 49.6)	χ^2=19.267;	67 (48.9)	29 (21.2)	41 (29.9)	χ^2=1.737;
	MI	60 (50.8)	24 (20.3)	34 (28.8)	df=2; p<0.001	55 (46.6)	33 (28.0)	30 (25.4)	df=2; p=0.420
TC	CS	45 (25.3)	44 (24.7)	89 (50.0)	χ^2=26.515;	88 (49.4)	36 (20.2)	54 (30.3)	χ^2=2.939;
	MI	74 (53.2)	25 (18.0)	40 (28.8)	df=2; p<0.001	70 (50.4)	37 (26.6)	32 (23.0)	df=2; p=0.230
BP	CS	37 (27.7)	36 (26.5)	63 (46.3)	χ^2=19.956;	73 (53.7)	28 (20.6)	35 (25.7)	χ^2=0.783;
	MI	58 (55.2)	20 (19.0)	27 (25.7)	df=2; p<0.001	59 (56.2)	24 (22.9)	22 (21.0)	df=2; p=0.676
CW	CS	29 (30.5)	20 (21.1)	46 (48.4)	χ^2=15.247;	50 (52.6)	18 (18.9)	27 (28.4)	χ^2=0.681;
	MI	49 (51.6)	20 (21.1)	26 (27.4)	df=2; p<0.001	45 (47.4)	22 (23.2)	28 (29.5)	df=2; p=0.711
BMI	CS	40 (33.9)	26 (22.0)	52 (44.1)	χ^2=15.247;	68 (57.6)	22 (18.6)	28 (23.7)	χ^2=0.807;
	MI	61 (56.5)	24 (22.2)	23 (21.3)	df=2; p<0.001	56 (51.9)	24 (20.4)	28 (25.9)	df=2; p=0.668

BGL – blood glucose level; TG – triglyceride; TC – total cholesterol; BP – blood pressure; CW – circumference of waist; BMI – body mass index

Some components of MS were significantly more frequent in patients with clinical depression after stroke. The difference among respondents according to the degree of depression was significant in the number of components after the stroke, which was not the case with an anxiety (Table 5). The length of illness did not affect the quality of life in groups or by a reference parameter.

DISCUSSION

Patients who survived MI were more satisfied with the quality of life and health than those who survived the stroke. The reason for this may be less pronounced effects of illness in patients after MI, less dependency on someone else's help, but the lower incidence of depression, compared to affect after stroke. Depression was significantly more frequent in the group after a stroke compared to patients after a heart attack. Data from the literature suggest that the prevalence of depression after stroke ranges from 20 to 65% (Lai et al. 2002), and after MI average 25% (Kaptein et al. 2006). Depression after stroke is associated with poor functional and psychosocial outcome and affects cognitive abilities, functional recovery, quality of life and medical care of patients with stroke (Carod-Artal et al. 2009). Depression significantly complicates the rate of recovery and increases mortality in patients after

stroke (Mitchell et al. 2008) also after MI (Kaptein et al. 2006, de Jonge et al. 2006).

The high prevalence of depression in our study may be due to a larger number of patients older than 65 years, and unrecognized and untreated depression, but we should not ignore the impact of war on the mental health of our patients, although we have not specifically investigated. Women were more depressed than men after stroke, but we did not show significant differences, which may be due to a smaller number of women involved in the study. Most depressed patients were older than 65 years, a significant difference in the incidence of depression after stroke depended on the level of education. Significantly greater number of older patients and patients whose education lasted 12 years or less had a pronounced depression. Little is known about the relation of depression after stroke and the degree level of education (Lee et al. 2009), but it is proven that a higher level of education has a favorable effect against depression and anxiety (Bjelland et al. 2008). And literature states that the incidence of first stroke was significantly higher among low educated compared to highly educated men and women (Widén Holmqvist et al. 1998, Löfmark & Hammarström 2007). It was found that the level of education lower than secondary level of education had an increased risk for fatal stroke, and also an increased risk of heart attack, regardless of age of the patient (Qureshi et al. 2003). Löfmark with associates (Löfmark & Hammarström 2007) states that the incidence of first stroke was significantly higher among low-educated in comparison with highly educated men and women. The highest incidence of stroke was found among low-educated women aged 75 to 85 years (Löfmark & Hammarström 2007). Gillum (Gillum & Mussolino 2003) found a significantly worse survival in patients whose education lasted <8 years ($p=0.0005$ for men and $p=0.0001$ for women). This is explained by the greater use of nicotine and alcohol formulations, poor or no physical activity habits, history of diabetes and heart disease, and elevated blood pressure (Gillum & Mussolino 2003). Lower level of education at older patients requires more effort in health promotion and education (Lee et al. 2009).

In patients with a history of heart attack no difference for depression was significant in relation to age and length of education. Respondents in the older age groups had more often pronounced clinically depression after the SU, as well as those whose education lasted 12 years or less. For anxiety it has been found a significant difference in relation to the length of education. Uneven gender distribution of respondents in our study and a large number of respondents who were educated ≤12 years could affect this result. Other results are consistent with the results of studies published in the literature (Löfmark & Hammarström 2007, Del Ser et al. 1999, King 1996).

Quality of life and health satisfaction were rated better among respondents who lived alone in comparison with others, but the difference was not statistically significant. However, physical, psychological and environmental domains are significantly better rated in single persons than those who live in the community. There are evidence that the amount of support the patient gets may be important for recovery, but also can lead to excessive protection and worse stimulation. Patients who live alone may be better to recover than those who live within the family (Mant et al. 2005). Inadequate social support (social isolation) may be a risk factor for worse outcome of stroke. Patients with the lowest level of support fail to maintain a continuous process, which leads to a decrease in functional status over time (Mant et al. 2005). It is possible that family and friends of these patients underestimate their needs. Paradoxically, patients with mild stroke may be at greater risk of social isolation and less successful recovery than patients with serious damage, depending on the obtained support (Mant et al. 2005). On the other hand, our results in favor of Glass-his statement that patients with higher levels of aid may have worse outcomes because they rely on help from others (Glass et al. 1993), as those who live alone are not able to.

A large number of patients after stroke had MS. We do not know whether these patients had the syndrome before the underlying disease. Men were significantly more likely to have MS, patient's ≥ 65 years, and those who were educated 12 years or less. Takshashi et ass (Takahashi et al. 2007) in almost 1500 Japanese over 55 years found metabolic syndrome in 11.0% men and 1.1% of women. And other sources from the literature suggest that MS is more common in men, as the reason cited frequently enjoying tobacco and alcohol products (Del Ser et al. 1999). We did not find described in the literature, the influence of length of education on the incidence of metabolic syndrome, but also to be looked at in terms of bad food habilitations and less physical activity in persons with lower levels of education.

The prevalence of depression and anxiety among the subjects with stroke and metabolic syndrome in our study was significantly higher than in those with heart attack and MS. Dunbar (Dunbar et al. 2008) found that subjects with MS had higher total HADS for depression than those without MS, which confirmed our research.

In the stroke group, depressed subjects were significantly more frequent with increased level of triglycerides and cholesterol in blood, high blood pressure, increased waist circumference and BMI than those after the MI and this difference was significant. Elevated level of glucose in blood was more common in depressed patients after stroke, but the difference compared to the patients after MI was not significant. We have to note that the existence of DM was exclusion factor from the study, which is the reason for such results. We did not found differences for anxious patients in the number of individual components of MS, depending on the degree of anxiety among the study groups. The literature describes a significant and independent connection between depression and increased waist circumference and low HDL cholesterol

(Dunbar et al. 2008). There was also demonstrated a significant association of prevalence of depressive symptoms and visceral obesity in men and women in hyperglycemia (Gil et al. 2006).

CONCLUSION

The people who survived the stroke had significantly poorer quality of life compared to those after SU. Depression was significantly more frequent in the stroke group than in the group of MI. Early recognition and treatment of depression in the same patients after stroke significantly improved the quality of life. There was a significant relationship between depression and MS, and their presence has significantly changed the quality of life in patients after stroke. Depressed patients after stroke were significantly more numerous in individual components of MS than those after SU. Significantly greater number of depressed patients after a stroke had hypertriglyceridemia, hypercholesterolemia, and hypertension, which was not in the group of heart attack. The frequency of individual components can not be connected with the development of depression in patients after stroke, because this components of MS were not identified as often after a heart attack. It would be good to compare our results with existing, seeking a possible connection between the individual components of MS and the degree of depression.

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