

LIFE QUALITY IN CASES WITH CHRONICAL DEGENERATIVE ILLNESS OF LOCOMOTIVE SYSTEM REGARDING SEX, AGE AND OVERWEIGHT

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ABSTRACT

Disturbances of muscle and skeleton system are related to pain, functional damages and inability to work. Measure of life quality offers a sequence of data on illness influence on everyday functioning. The aim of this paper is evaluation of life quality in cases with degenerative illnesses of locomotive system and influence of sex, age, weist and BMI on life quality.

Epidemiologic research was conducted on 71 tested subjects with diagnosis of chronical degenerative reumatical illness. Tested subject were measured weist values, BMI was determined and all of them fulfilled EQ5D questionnaire for life quality assessment. According to VAS scale their health condition was evaluated. Life quality of tested subjects was decreased especially in department of depression and increased concern (2.30 – 2.57) as well as pain and discomfort (2.11 – 2.31). We didn't determine statistically significant sex influence ($p > 0,05$), age, ($p > 0,05$) weist values ($p > 0,05$) or BMI ($p > 0,05$) our tested subjects life quality. According to VAS scale health condition of tested subjects is low ($6, 76 \pm 1,04$).

Key words: *osteoarthritis, life quality, EQ 5D, BMI, overweight*

INTRODUCTION

Degenerative joint illnesses (arthrosis, osteoarthritis, osteoarthritis, OA) is noninflammatory joint illness characterized with primary dissolvment of cartilage that leads to disturbed joint functioning, secondary inflammatory changes, pain and ankhilosis (Vrhovac et al., 2007).

There are different ways of OA defining, therefore, certain studies use special questionnaires, radiological definitions of OA and symptomatic OA definitions that include joints pain and radiology proof of OA (Felson, 1998).

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OA is significant public-health problem for its large influence on invalidity and joined morbidity in elderly person (Guccione et al., 1994, pp. 351–358), and increasment of OA frequency with prolonging of life time and larger involvement of older and overweight population in general population number in world is also expected. It is estimated (Lawrence and associates. 2008) that 26,9 million Americans suffer from certain type of OA in age from 25 and more. Study that included 10 year monitoring confirmed diagnosing of knee OA in 5,8%, hip OA 7,3% and arm OA 5,6% and overweight was significantly related to knee and arm OA but not related to hip OA (Grotle, et al., 2008, p. 132).

Prevalence of cervical syndrome in Norway is 13,8%, in Finland 9,5% in men and 13,5% in women, and America 7% in men and 9,45% in women (Kapidžić, 2007, pp. 117-122). Total prevalence of OA reported is 18% of Ontario population older than 16 and in 2,5% of population it results in long-term invalidity (Badley, 1995).

Economic influence of OA in terms of direct medical expense and as consequence of leaving work is impressive (Gabriel et al., 1997) and expenses of leaving work for joint ache are estimated as 3% of total homemade production (Felson et al., 2000). In 2005 hospitalization expenses due to intervention on muscular and bone system in USA that generally included arthroplastics and hip replacement were 31,5 billion dollars or more than 10% of total expenses' in all hospitals.

It emphasizes dramatically increase of social expenses' of OA because only 10 years earlier total OA expense in USA was estimated on 15,5 billion dollars (in the year 1994) (Yelin, 1998).

Concerning the fact that preventive interventions and therapeutic possibilities for OA are limited we can expect that morbidity and economic influence of OA increase with ageing of developed world population. Pathogenesis of OA is probably includes multiple factors and mutual influence of system risk factors such as overweight and older age with local risk factors such as mechanical overload and traumas can develop diagnosing of this illness in any joint (Chaganti & Lane, 2011). Systematic factors that can lead to increased risk

of OA under the influence of local factors such as injury can initiate cascade changes than can lead to development of OA. While systematic factors such as age and sex are general risk factors, local factors on the other hand can have potential for intervention and change of illness risk.

Several studies confirmed that older life age is related with increased frequency of OA (Oliveria et al., 1995). Overweight in adult can lead to changes in muscular and bone system that result with larger risk in overweight population for development of muscular and skeleton illnesses (Messier, Loeser & Miller, 2004). It is also proven that associating of older age with increasment of BMI is related to increased incidence of hip OA (Murphy et al., 2008).

Framingham study has shown that incidence of knee OA diagnosing is 1,7 times higher in women than in men (Felson et al., 1995). It is estimated that life age increases risk of symptomatic knee OA up to 46,8 % observed in women during menopause (Oliveria et al., 1995) what proves the fact that hormonal problems can contribute to development of OA.

Muscular and skeleton pain and OA are ranged from middle to long-term overweight consequences in adults. Data from many studies show strong relation between overweightness, defined as BMI (body mass index) above 30, x-ray knee OA, for example in Framingham study (Felson et al., 1995), John Hopkins precursor of study (Gelber et al., 1999), joined study in Great Britain (Cooper et al., 2000) and Dutsch (Reijman et al., 2007). Two primary theories were suggested for explanation of relation of overweightness and OA: biomechanical and systematic/metabolic mechanism (Van Saase et al., 1988). Biomechanical theory suggests that overweightness increases axial pressure (local efficiency) with consequential degenerativity of joint cartilage. Metabolic theory considers that certain metabolic factors have negative influence on cartilage what results in risk increasment of OA by overweightness (Hartz et al., 1986, pp. 311–319).

Literature data have shown that muscular mass or muscular strength protective factors for OA diagnosis development (Toda et al., 2000).

Some data show that in 34% of women in middle life age that have OA on one side in two years time OA will develop in contra lateral knee, and overweight have significant influence on diagnosing of OA which is 5 times more often in overweight women than in those cases with lower BMI (Hartz, Hart & Doyle, 1994, pp. 565–568). Datas from Chingford study show that overweight persons have almost 18 times increased risk for development of bilateral knee OA (Spector, 1990). Since overweightness relation with hip OA is less and nonconsistent it leads to conclusion that influence of overweightness on knee is not necessary of mechanical nature. Same results point to therapeutic weight loss potential (Cooper et al., 1992). The aims of this research were to evaluate life quality of our tested subjects with earlier diagnosis of degenerative reumatological disease based on EQ 5D questionnaire and to evaluate age, sex and overweightness (BMI and weist values) on life quality of tested subjects.

TESTED SUBJECTS AND METHODS

Epidemiological study in department of family medicine in institution for health in Banovici and Živinice was conducted in period from 30.1 i 10.2.2012. Research conducted all patients of both sexes with determined diagnose of chronic degenerative disease of locomotive system (coxarthrosis, gonarthrosis, cervical or lumbal ache syndrome) that visited these ordinations in this period. Research didn't include test subjects with recently diagnosis of degenerative illness. All tested subjects were taken data of age, sex, occupation, years of life, family status. All tested subjects also fulfilled EQ5D questionnaire on life quality that is used as standardized measuring instrument for life quality measuring concerning the health condition of tested subject (EQ 5D questionnaire follows). Questionnaire contains 5 questions related to mobility, ability to self-concern, conducting of usual activities, questions related to pain and concern/fear for ones health. Questionnaire contains 3 answers and answers are graded from 1 to 3, 1- absence of problem, and number increases with life quality decrease.

EQ-5D questionnaire

Mobility

1. I have no problem with mobility
2. I have certain problems with mobility
3. I am strapped to bed

Self - concerning

1. I have no problem with self-concerning
2. I have certain problems during self- washing and dressing
3. I am not in condition to wash and dress Usual activities (ex. Job, studying, house jobs, family or free activities)

1. I have no problem with conducting of usual activities
2. I have certain problems in conducting of my usual activities
3. I am in no condition to perform my usual activities

Pain/discomfort

1. I feel no pain or discomfort
2. I feel certain pain and discomfort
3. I feel ultimate pain and discomfort

Concern/depression

1. I am not concerned or sad
2. I am relatively concerned or sad
3. I am totally concerned or sad

All patients were offered a analogue-visual scale (VAS) (Wewers i Lowe 1990) on which tested subjects graded degree of suffering (pain) from 1 to 10. VAS scales' length is 10 units, from 0 to 10 on which between mark 0 stands for no pain and 10 stands for the most possible pain, you can show what kind of pain you're dealing with. Their height values are also taken, as well as weight, weist values and BMI index value is determined. According BMI values tested subjects were divided into those with normal weight values (BMI index up to 25kg/m²) and overweight, and according to weist values (women ≤ 88 cm, men ≤ 102 cm) and group with weist above referent values. Based on received data, life quality is determined through EQ 5D questionnaire. Sex, age, overweight and weist values influence on life quality of tested subjects is also determined. Statistical data were processed in SPSS 16 computer programme.

Scientific methods of descriptive statistics (frequency, arithmetical values, standard error and standard deviation) were used in analysis and life quality differences analysis used χ^2 and Pearson's correlation for certain groups. Statistical significance method for values "p", usual level of significance "p < 0, 05" was selected.

RESULTS

71 tested subject was included in our research, 36 (50, 7%) of men in average life age of 47, 22 years and 35 (49, 3%) of women in average life 58, 56 years. Statistically significant difference in age structure between sexes was also evident. 32, 4% of tested subjects were housewives, 25, 4% were with secondary education level, 23, 9% were highly qualified workers, 12, 7% were low qualification workers and 5, 6% were retired. 81, 7% lives with their families, 11, 3% lives with their children and 7, 0% lives single life.

Lumbal ache syndrome was evident in 45 (63, 33%),

cervical syndrome in 11 (15, 49%) and gonarthrosis in 15 (21, 12%) tested subjects. Average time of disease period was $8, 06 \pm 6, 13$ years. According to our results life quality of our tested subjects is lower for 1-1, 5 degrees according EQ5D questionnaire. Decreasment of life quality is most evident in area of concern and depression (2.30–2.57), pain and discomfort (2.11–2.31) and usual activities (1.94–2.17). Smaller decrease of life quality is evident in mobility (1.76–1.93), and less evident in self-concern (1.50–1.74) (Table 1, 3 i 4). Our research has shown the absence of statistically significant differences according to age (table 1) or in one parameter EQ-5D questionnaire on life quality: in problems with locomotion ($\chi^2(1)=0,144$; $p>0,05$), in ability of self-concern ($\chi^2(1)=0,410$; $p>0,05$), in ability to perform usual activities ($\chi^2(2)=0,404$; $p>0,05$), in feeling of discomfort or pain ($\chi^2(1)=0,872$; $p>0,05$). According to VAS scale degree of health condition in our tested subjects is ($6,76 \pm 1,04$).

Table 1. Gender influence on life quality in cases with degenerative illnesses of locomotive system

	Sex	95% Confidence interval for			
		Mean	Std. Deviation	Std. Error of Mean	Mean
EQ-5D mobility	male	1.86	0.351	0.058	1.74 – 1.98
	female	1.83	0.382	0.065	1.70 – 1.96
	Total	1.85	0.364	0.043	1.76 – 1.93
EQ-5D Self-care	male	1.58	0.500	0.083	1.41 – 1.75
	female	1.66	0.482	0.081	1.49 – 1.82
	Total	1.62	0.489	0.058	1.50 – 1.74
EQ-5D Usual activities	male	2.08	0.500	0.083	1.91 – 2.25
	female	2.03	0.453	0.077	1.87 – 2.18
	Total	2.06	0.475	0.056	1.94 – 2.17
EQ-5D Pain/discomfort	male	2.17	0.378	0.063	2.04 – 2.29
	female	2.26	0.443	0.075	2.10 – 2.41
	Total	2.21	0.411	0.049	2.11 – 2.31
EQ-5D Anxiety /depression	male	2.47	0.560	0.093	2.28 – 2.66
	female	2.40	0.604	0.102	2.19 – 2.61
	Total	2.44	0.579	0.069	2.30 – 2.57

In this research age didn't significantly influence on life quality of tested subjects (table 2).

Table 2. Age influence on life quality in cases with degenerative illnesses of locomotive system

EQ 5D	EQ-5D				
	EQ-5D mobility	EQ-5D Self- care	EQ-5D Usual activities	EQ-5D Pain/discomf ort	EQ-5D Anxiety/depression
Pearson Correlation	0.022	-0.098	-0.110	0.012	0.048
Sig. (2-tailed)	0.857	0.418	0.361	0.919	0.694
Age N	71	71	71	71	71

According to Pearsons' correlation of BMI (table 4) and weist values (table 3) didn't significantly influence on life quality in cases with degenerative illnesses of locomotive system, what Pearsons' correlation has proven (table 5).

Table 3. Weist values influence on life quality in cases with degenerative illnesses of locomotive system.

	Weist values	Mea n	Std. Deviation	Std. Error of Mean	95% Confidence interval for Mean
EQ-5D mobility	normal	1.85	0.364	0.063	1.72 – 1.98
	Above normal	1.84	0.370	0.060	1.72 – 1.96
	Total	1.85	0.364	0.043	1.76 – 1.93
EQ-5D Self- care	normal	1.64	0.489	0.085	1.46 – 1.81
	Above normal	1.61	0.495	0.080	1.44 – 1.77
	Total	1.62	0.489	0.058	1.50 – 1.74
EQ-5D Usual activities	normal	2.06	0.496	0.086	1.88 – 2.24
	Above normal	2.05	0.462	0.075	1.90 – 2.20
	Total	2.06	0.475	0.056	1.94 – 2.17
EQ-5D Pain/ discomfort	normal	2.15	0.364	0.063	2.02 – 2.28
	Above normal	2.26	0.446	0.072	2.12 – 2.41
	Total	2.21	0.411	0.049	2.11 – 2.31
EQ-5D Anxiety /depression	normal	2.45	0.564	0.098	2.25 – 2.62
	Above normal	2.42	0.599	0.097	2.22 – 2.62
	Total	2.44	0.579	0.069	2.30 – 2.57

Table 4. BMI influence on life quality in cases with degenerative illnesses of locomotive system

			Std.		95% Confidence interval
BMI		Mean	Deviation	Std. Error of Mean	
categories			n	Mean	
mobility	normal	1.82	0.393	0.095	1.62 – 2.03
	overweight	1.85	0.359	0.049	1.75 – 1.95
	Total	1.85	0.364	0.043	1.76 – 1.93
EQ-5D Self-care	normal	1.53	0.514	0.125	1.26 – 1.79
	overweight	1.65	0.482	0.066	1.52 – 1.78
	Total	1.62	0.489	0.058	1.50 – 1.74
EQ-5D Usual activities	normal	1.88	0.485	0.118	1.63 – 2.13
	overweight	2.11	0.462	0.063	1.98 – 2.24
	Total	2.06	0.475	0.056	1.94 – 2.17
EQ-5D Pain/ discomfort	normal	2.12	0.332	0.081	1.95 – 2.29
	overweight	2.24	0.432	0.059	2.12 – 2.36
	Total	2.21	0.411	0.049	2.11 – 2.31
EQ-5D Anxiety /depression	normal	2.29	0.686	0.166	1.94 – 2.65
	overweight	2.48	0.540	0.074	2.33 – 2.63
	Total	2.44	0.579	0.069	2.30 – 2.57

Table 5. Weist values and BMI influence on life quality in cases with degenerative illnesses of locomotive system.

EQ 5D		EQ-5D mobility	EQ-5D Self-care	Usual activities	EQ-5D Pain/discomfort	EQ-5D Anxiety/depression
OS	Pearson Correlation	0.092	-0.122	-0.147	0.098	0.027
	Sig. (2-tailed)	0.443	0.309	0.222	0.415	0.824
	N	71	71	71	71	71
BMI	Pearson Correlation	0.142	0.047	-0.020	0.094	0.086
	Sig. (2-tailed)	0.237	0.695	0.865	0.436	0.476
	N	71	71	71	71	71

DISCUSSION

Generally, measure of life quality can offer a sequence of data on influence of rheumatic and other illnesses on everyday functioning (Walker & Littlejohn, 2007). Muscular – skeleton disturbances are often related with pain, functional damages and inability to work and are most often reasons for using of health resources (Verbrugge & Juarez, 2006; Ang et al., 2005). Factors that influence on life quality in those with muscular-skeleton illnesses include not only pain and exhaustion but also difficulties in everyday activities starting from basic functions to more complicated tasks such job activities, raising of children etc. (Walker & Littlejohn, 2007). Earlier research have shown significant decrease of life quality in those with rheumatic acute and chronic diagnosis (Lapčević et al., 2010).

Referent values for self-concerning section was from 1,40 to 1,47 in conducted research, where decrease of life quality was the least, in concerning and depression section 1,79 -1,86 and for pain and

and discomfort section 1,99-2,02 where the quality of life was the lowest (Lapčević et al., 2010). In this research life quality of tested subjects was lower, in self concerning section was from 1, 50-1, 74, where decrease of life quality was the lowest, in pain and discomfort section from 2.11 to 2.31, and according to our research the most significant decrease of life quality was in section for concernness and depression 2.30 – 2.57. The existence of widely spread influence of rheumatic and other chronic illnesses on physical, psychological and social factors of those with these diagnoses is evident and during measuring of life quality the tool that covers more aspects of life qualities should be used. The one used in this research paper is compatible with earlier facts that show frequency of depressive symptoms in 60% of those with chronic somatic illness and that depression is related to bad results of healing as well as increased morbidity and mortality in rheumatic cases.

Rheumatoid arthritis and fibromyalgia are related to changes in psychological functioning with 20 to 60% depressive symptoms (McWilliams et al., 2003). This research has also proven that the most evident decrease of life quality was in section of concern and depression.

Some clinical and epidemiological studies have shown that patients with acute rheumatic diseases have lower life quality regarding healthy population (Salaffi et al., 2009), and concerning patients with chronic rheumatic illness (Wollfe & Hawley, 1997). Osteoarthritis (OA) is important cause of long-term health problems and most usual reason for long-term invalidity in population. Long-term disability is followed by significant influence on everyday life including problems with immobility, dependability on others and difficulties in everyday activities, social isolation, decrease of activities, employment and low payment (Badley, 1995). Knee OA is chronic condition that characterizes the loss of mutual function and persistent pain that reduces life quality (Dominick et al., 2004). The effectiveness of symptomatic knee OA on life quality is similar to those in breast cancer metastasis (Loyd et al., 2006). Studies in which VAS scale was used, graded from 0-100, have shown that average grade of health condition in America was 63 (Wollfe & Hawley, 1997), and in Serbia 53, 75 (Lapčević et al., 2010). Average value of VAS scale in our research (graded from 0 – 10) is $6,76 \pm 1,04$, which means that health status of our tested subjects is on lower level i.e. low level what is compatible to decrease of quality life which is most evident in section of pain and discomfort.

Overweight and knee OA are among most frequent illnesses in Americans from 50 to 84 years of life (Dillon et al., 2006). A certain study determined that overweightness is related to bad life quality and that joint ache in overweight persons influence relation between BMI and life quality (Heo, et al., 2003, pp. 209–16). In overweight cases life quality is decreased for 12% in all age groups. Persons with knee osteoarthritis have quality of life decreased for 13% as well as in those with age of 50 and for 10% in those with 70 years of life and more (Losina et al., 2011). Some researches have shown that body mass as well as distribution of grease tissue is in-

dependently related with knee OA (Abbate et al., 2006). Sanghi and associates confirmed theory that BMI and other anthropometrical measures have significant value with knee OA, but, in confrontation to general knowledge, peripheral grease in men and central grease in women (weist/hips measurement) are strongly related with knee OA than BMI (Sanghi et al., 2011). Our research has shown that weist values have no influence on life quality change in cases with degenerative illnesses of locomotive system. Also, there was no evident difference in evaluation of health status of tested subjects (according to VAS scale) with increased weist values regarding those with recommended weist values around (6,7).

Study conducted in Finland on 823 tested subjects reported of strong connection of knee OA and BMI = 25-29, 9 or > 30,0 (Toivanen et al., 2010). Similar results were found in Framingham study where 598 tested subjects without knee OA didn't have increased risk of developing the same diagnosis with increase of BMI (Felson et al., 1995).

These results are important because of its consistency in analysis that overweight cases have risk of knee OA development and point to potential changeable risk factors when this illness is discussed with patients. OA is important cause to long-term health problems and are the most frequent reason for long-term invalidity in population. Long-term disability followed by significant influence on everyday life including problems with locomotion, dependability and trouble in everyday activities, social isolation, decrease of activity, employment and low payment (Badley, 1995). If overweight cases could decrease body weight for 5 kilograms or if BMI could be in range of recommended values, 24% of surgical interventions on knee caused by OA would be avoided (Coggon et al., 2001). According to Messier, weight loss of 5% during workout and healthy food programme improves function and mobility and decreases pain in overweight cases with OA (Messier et al., 2005).

However, each pound (0,454 kg) of weight loss will result with 4 times smaller pressure on knees during everyday activities, and if we observe this fact accumulated in thousands of steps on daily basis, this will result with clinical significance (Messier et al., 2005).

According to results of this research, BMI has no influence on life quality change in cases with degenerative illnesses of locomotive system. Also, there is no significant difference in evaluation of health status of tested subjects (according to VAS scale) with increased weist values in comparing to those with recommended weist value (about 6,69- 6,77).

In older individuals with OA and RA generally lower health condition, physical condition, mental condition, sleeping and limitation of other activities is evident in comparing to those without arthritis (Dominick et al., 2004).

There are differences in life quality according to demographic markers and co-morbidity among tested subjects with OA and RA (Dominick et al., 2004).

Other research have proven influence of older life age, race, life in shelters for old people, lower social status and more evident comorbidity with worse result of tests on life quality (Zhang et al., 2008; Wang & Beydoun, 2007). Earlier research has proven that age has statistically significant influence on life quality in cases with chronic rheumatic illnesses that is evident in all 5 markers of life quality according to EQ 5D questionnaire (Lapčević et al., 2010). According to this research age doesn't have significant influence on life quality of tested subjects. In comparing to other researches (Wang & Beydoun, 2007), in some researches men have lower quality of mental and physical health in comparing to women (Dominick et al., 2004). Newer approaches on invalidity research confirm the role of demographic, physical, psychological, social and environment factors that lead to worse outcome of chronical somatic conditions (Verbrugge & Juarez 2006). It is proven that there is no evidence of statistically significant difference among sexes in any of EQ 5D questionnaire parameters. Even though our research haven't proven the influence of overweightness on life quality of our tested subjects, we shouldn't forget the proven fact that prevention of overweightness in 10 years time could prevent 178 071 cases of coronary diseases, 889 872 cases of diabetes mellitus and 111 206 cases of surgical knee replacement (Losina et al., 2011). This decrease of overweightness would prolong life age for 7,812 years and improve life quality in adult Americans in age of 50 to 84 years (Losina et al., 2011).

CONCLUSION

Our study has shown that life quality of cases with degenerative illnesses of locomotive system significantly decreased in all segments, especially in section of pain and discomfort and concern and depression. According to our results, age, sex and overweightness measured by weist values and BMI didn't show significant statistical influence on life quality of our testers. According to VAS scale, the level of health condition (pain) is on low level in our tested subjects.

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