The influence of implantation of total hip endoprosthesis on the life quality

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Abstract- Introduction:Total hip endoprosthesis is one of the most frequent and effective methods that are used in the treatment of progressive degenerative hip changes. After the implantation of total hip endoprosthesis, patients perception on their postoperative improvement and health has big role in their contentment and thus in the success of the surgical procedure. The aim of this survey is to examine whether there are differences in the quality of life of people in third age before and after the implantation of total hip endoprosthesis.Material and methods:The survey included 100 examinees in the third age, above 65 years, of both genders, with the disease of hip joint that had been treated at the Clinics for orthopaedics and traumatology of UKCS by implanting the total endoprosthesis. The examinees were questioned before the surgery and after implanting the total hip endoprosthesis. The survey has covered the period from 1st January 2014 till 31st December 2016. As an instrument tool in the survey well validated SF-36 questionnaire for the estimation of life quality and total health status was used. Results: Evaluating all the elements in SF-36 questionnaire it was determined that statistically significant improvement of all the life quality elements that this questionnaire measured was detected, after the conducted surgery compared to the state before the surgery, p=0.001. Statistically biggest improvement has been detected in limitations that happened because of physical and emotional issues, and then in those that were related to physical and social functioning (p=0.001). Body pains and vitality are also statistically significantly better after the conducted surgery (p=0.001). Conclusion:Out of the results of the survey it derives that the quality of life of the people in third age is significantly better after the surgery of implanting the total hip endoprosthesis.

Index Terms— Hip, endoprothesis, life quality, SF-36, orthopaedic, rehabilitation.

1 Introduction

The expected life duration grows worldwide, and aging of population the need for more qualitative services in health care grows. Share of the people over 65 years in population is higher and higher. Older life age is significant risk factor for hip diseases. [1] Diagnostics of degenerative changes beside the clinical examinations, includes classical radiography, and if the need arises computerized tomography, too.Total hip endoprosthesis is one of the most frequent and effective methods that are used in the treatment of progressive degenerative hip changes. [2] It provides reliable pain relief and significant function improvement in the patients that suffer from osteoarthritis or inflammative hip arthritis. Currently about 50 000 total endoplastics are done in the Great Britain a year, while in the world that number is higher than 300 000. Two thirds of those are conducted in the patients above the age of 65. Ninety to ninety five percent of the patients can expect for total hip endoprosthesis to last next 10 years, and 85% of them even 20 years. Life quality after the surgery is proximately equal to the life quality of the healthy referent population. [3] Data on life quality that refer to the health are precious, they can provide relevant information on patient health status, health workers and they need to be used as an explanation for applying the most adequate standard of health care. Additional knowledge and scientific dissemination of the surgery outcome are supposed to help better to manage the patients who were subjected to total hip arthroplasty and to optimize the use of this procedures. [4] The aim of this survey was to examine whether there are differences in the life quality of third age people before and after the surgery of implanting total hip endoprosthesis.

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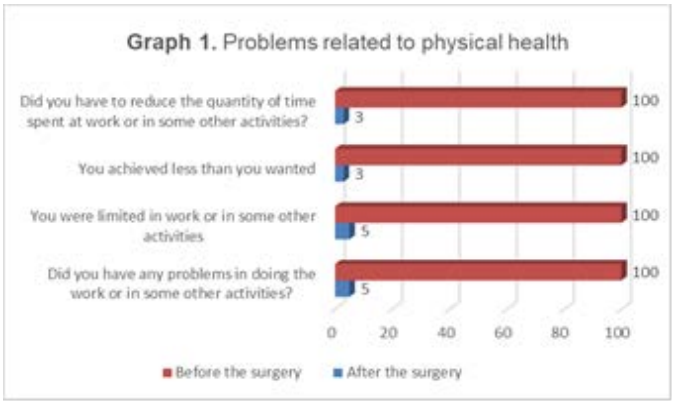
2 Material and methods

The survey included 100 examinees in the third age, above 65 years, of both genders, with the hip joint disease that had been treated surgically at the Clinics for orthopaedics and traumatology of UKCS by implanting the total endoprosthesis. The examinees were questioned before the surgery and after implanting the total hip endoprosthesis. The survey has covered the period from 1st January 2014 till 31st December 2016.
As an instrument tool in the survey well validated SF-36 questionnaire for the estimation of life quality and total health status was used. SF-36 follows eight different areas (scales) of health (vitality, body pain, physical functioning, general health perception, limitations because of physical health, social functioning, limitations because of emotional issues and mental health), that were graded in span from 0 to 100. [5]

3 Results

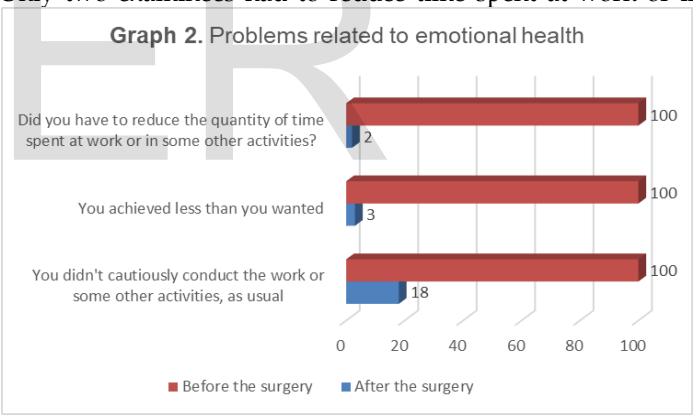
Evaluating all the elements in SF-36 questionnaire it was de-

termined that statistically significant improvement of all the life quality elements that this questionnaire measured was detected, after the conducted surgery compared to the state before the surgery, p=0.001. Statistically biggest improvement has been detected in limitations that happen because of physical and emotional issues, and then in those that were related to physical and social functioning (p=0.001). Body pains and vitality were also statistically significantly better after the conducted surgery (p=0.001). From the total number of the examinees in this survey 34% of them were male, and 66% female. Average age of the examinees in this survey was 71.45±6.74 years. Applying chi square test statistically significant difference was established in the general health before and after the surgery, p=0.001. Before the surgery 97% of the examinees graded their health as bad, and 3% of them as very bad. After the surgery and the conducted poll, 31% of the examinees graded their health as excellent, 11% very good and 58% good. No examinees graded their health as bad and very bad. Limitations in climbing a few stairs before the surgery were present in 67% of the examinees, for that percentage to be statistically significantly reduced after the surgery and it amounted 1% (p=0.001). Before the surgery limitations in climbing one stair were present in 53% of the examinees, slight limitations in 47% of the examinees, while none examinee stated they had no limitations at all. After the surgery and the conducted poll 85% of the examinees had no limitations while climbing one stair, 14% of the examinees had slight limitations while only one examinee had total limitations in climbing one stair (p=0.001). Before the surgery 92% of the examinees had limitations in bending, kneeling or lowering down, 8% of the examinees had slight limitations, while no examinees were without the limitations. After the surgery and the second poll only 1% of the examinees had limitations in bending, kneeling and lowering down, 44% of the examinees had slight limitations, while 55% of the examinees were without any limitations, (p=0.001). Before the surgery 61% of the examinees had complete limitations in walking more than 1.5 km, only 1% of the examinees had slight limitations, while 38% of the examinees were without any limitations. After the surgery 22% of the examinees had complete limitations in walking more than 1.5 km, 39% of the examinees had slight limitations, while 39% of the examinees were without any limitations, (p=0.002). Before the surgery 71% of the examinees had limitations in walking a few blocks, after the surgery there were only 15% of them. Before the surgery 4% of the examinees had slight limitations and 30% of the examinees after the surgery. No limitations in walking a few blocks before the surgery were present in 25% of the examinees, while after the surgery that percentage was statistically significantly higher and amounted 55% (p=0.001). Complete limitations in walking one block was present in 55% of the examinees, for that percentage to be statistically significantly reduced after the surgery to 14%. No limitations in walking one block before the surgery were present in 15% of the examinees, for that percentage to amount 67% after the surgery (p=0.001). Analyzing the problems related to physical health, based on the answers acquired by the poll, all the examinees had problems related to physical health before the surgery. After the surgery statistically significant improvement occurred, p<0.05. Only three examinees had to reduce time spent at work or in other activities after the surgery, the same number of the examinees stated that they achieved less than they wanted. 5% of the examinees were limited in some sort of work or in other activities. (graph 1)



Graph 1. Problems related to physical health

Analyzing the problems related to emotional health, based on the answers acquired by the poll, all the examinees had problems related to emotional health before the surgery. After the surgery statistically significant improvement occurred, p<0.05. Only two examinees had to reduce time spent at work or in other activities after the surgery (graph 2).



Graph 2.Problems related to emotional health

Before the surgery 85% of the examinees had difficult emotional problems that interfered with the normal social activities, and after the survey that percentage amounted 0%. After the surgery 48% of the examinees had no emotional problems that interfered with the normal social activities, p=0.001.
After the surgical procedure 54% of the examinees answered that they had no body pain during the last 4 weeks, and 44% of the examinees stated that they had slight pain. Before the surgery the examinees had moderate pain in 75% of the cases, and it was quite painful in 14% of the cases, p=0.001 (table 1). Before the surgery during the last 4 weeks 57% of the examinees had extreme influence of pain on normal work, while in the end of the survey that percentage amounted 0% (p=0.001).

Table 1. Analysis of body pain during last 4 weeks

							Total
		None	Very mild	Mild	Moder-ate	Se-vere	
Be-fore sur-gery	N	0	8	3	**75**	**14**	100
	%	0	8,0	3	**75**	**14**	100
After sur-gery	N	**54**	**44**	2	0	0	100
	%	**54**	**44**	2	0	0	100
χ^2=153.320; p=0.001							

By evaluating all the elements of questionnaire SF-36 statistically significant improvement of all the elements occurred after the conducted surgery compared to the condition before the surgery, p=0.001.

Statistically highest improvement occurred in limitations based on physical and emotional issues, and then in physical and social functioning (p=0.001). Body pains and vitality were statistically significantly better after the conducted surgery, as well (p=0.001). (Table 2).

Table 2. Evaluation of SF-36 questionnaire

		N	**X**	SD	SEM	Min	Max
Funtioning	Before	100	**21.65**	14.66	1.46	0	60
	After	100	**77.30**	15.94	1.59	0	100
	F=659.71 ; p=0.001						
Limittion because of phys cal isues	Before	100	**.00**	.00	.00	0	.00
	After	100	**96.00**	18.36	1.83	0	100
	F=2731 ; p=0.001						
Body pains	Before	100	**28.89**	18.18	1.81	0	77.5
	After	100	**86.67**	13.67	1.36	25	100
	F=644 ; p=0.001						
General health	Before	100	**37.15**	7.88	.78	15	55
	After	100	**61.35**	11.73	1.17	40	90
	F=292 ; p=0.001						
Vitality	Before	100	**16.25**	7.01	.70	10	40
	After	100	**51.85**	16.05	1.60	15	85
	F=412 ; p=0.001						
Social func-tioning	Before	100	**26.37**	11.90	1.19	12.5	125
	After	100	**78.26**	17.70	1.77	37	100
	F=591 ; p=0.001						
Limitation because of emotional issues	Before	100	**.00**	.00	.00	0	.00
	After	100	**91.90**	17.96	1.79	0	100
	F=2681 ; p=0.001						
Mental health	Before	100	**12.57**	7.90	.79	0	48
	After	100	**47.37**	18.60	1.86	10	84
	F=296 ; p=0.001						

4 Discussion

Life quality related to health was defined by World health organization (WHO) as multidimensional model that included physical, material, social and emotional wellbeing, as well as individual development and daily activities. That is complicated concept that requires especially developed instruments for the estimation of changes in the life quality that appear after the treatment. Acquiring precise results from the patients that underwent surgical interventions is a task that is considered quite difficult. Traditionally, until 10 years ago, the outcomes of joint replacement were estimated exclusively through the analysis of morbidity, mortality, expenditure of implants and operative complications. Contemporary approach to the results of orthopaedic surgery of joint replacement is no longer based only on the success or failure of implants: focus has been directed to patients' contentment and being able to reach the level of life quality. Hence comorbidity should be considered, as well as relate specific measures for mutual ones, compared to generic components through which general status of the individual has been analyzed. Therefore it is clear that measuring these indexes becomes necessary for the procedure that in the end aims at the improvement of the individual life quality, in order to achieve complete understanding of the effects of this intervention. [6] De Araújo Loures E. and Leite IC. [6] conducted the cohort study with 38 patients operated by a surgeon in the regional referent hospital during 2010, and those patients were prospectively studied and kept track of for at least six months until satisfying rehabilitation was achieved. Every patient gave the answers to form SF-36 immediately after the surgery and six months after it, as well. Pre and postoperative SF-36 results were as follows: physical function: 13.4-53.7; physical role: 9.21-48.0; pain in the body: 23.1-62.6; general health: 54.2-71.3; vitality: 40.3-69.9; social function: 40.8-74.3; emotional role: 23.7-64.9; and mental health: 52.6-80.4. All the results were statistically significant (p <0,001), which is in correlation to the results of our survey. In the conclusion they stated that the study indicated that significant improvement has occurred in life quality related to health in the patients that underwent the implanting the total hip endoprosthesis. After the implanting the total hip endoprosthesis patients perception on their postoperative improvement and health plays big part in their contentment and thus in the success of the surgical procedure. Short form SF-36 is the measure of life quality related to health that gives numerical value to the patients' perception on health. Elmallah RK and ass. [7] conducted the survey whose purpose was to determine SF-36 values of the patients after implanting total hip endoprosthesis, in order to determine whether the changes in results were clinically relevant. 188 patients that participated in the survey underwent total hip arthroplasty in 7 institutions. Average age was 69 years (span from 47 to 88

years), which is in correlation to the results of our survey. The results of SF-36 were improved compared to the preoperative condition and significant improvement has occurred (p <0,05) in all the points, which is also in correlation to the results of this survey. In the conclusion the authors stated that the results of SF-36 after the implantation of total hip endoprosthesis were in correlation to the functional outcome and that they have great clinical significance. Including this simple tool for measurement in the evaluation of patients' contentment after total hip arthroplasty is going to facilitate future analysis of expense and efficiency of implantation of total hip endoprosthesis. As it was already mentioned, life quality related to health is the key measure of surgery outcome. Shan L and ass. [8] explored the life quality after the implantation of total hip endoprosthesis in the patients with osteoarthritis. They made systematic examination of clinical studies published after January 2000 while using strict criteria. Grading the quality and making data tabulation was conducted by using beforehand determined forms. Data were synthesized by narrative examination and meta analysis of random effects using standardized means of answers. SF-36 form indicated the improvement in physical functioning (p <0,00001), body pain (BP) (p <0,00001), emotional functioning (p = 0,04) and social functioning (SF) (p = 0,03) until 7 years after the surgery. Results for general health (p = 0,29), mental health (p = 0,43) and vitality (p = 0,17) were similar. Stated results were in correlation to ours. Henry BM and ass. [9] in 18-months long longitudinal cohort study conducted the evaluation of SF-36 questionnaire after the implantation of total hip endoprosthesis, preoperatively and while following their progress in 1st, 3rd, 6th, 12th and 18th postoperative month. Total number of included patients was 168. All SF-36 results were improved after the surgery. Balik and ass. [10] conducted the study with the aim to examine preoperative and postoperative life quality and psychiatric symptoms of the patients with primary coxarthrosis after the implantation of total hip endoprosthesis. This study included 150 patients who underwent the implantation of total hip endoprosthesis. As the instrument tool in the survey short form of life quality scale SF-36 was used, in preoperative period and in 6th and 12th week after the surgery. In the results authors stated that out of the total number of the patients included into the study 28,7% were male and 71,3% female, which is in correlation to the results of our survey. On an average the patients were younger than those included into our study, because the average age was 58,34 ± 11,92 years. While statistically significant differences were found between the preoperative and postoperative period in terms of physical function, limitation of physical role, limitation of emotional role, energy, social function, pain and general health subscales SF-36, no significant differences related to mental health were found. In this study it was determined that the primary coxarthrosis significantly influenced the life quality of the patients in negative way and it could be kept track of by mental symptoms. After the total hip arthroplasty, significant improvement was noticed in life quality, depression and pains. Spalević and ass. [11] also stated that the most of the studies showed over 86% satisfied patients after the implantation of total hip endoprosthesis (especially related to pain relief), especially older patients and female population.

5 Conclusion

From the results of our survey it emanates that the life quality in third age people is significantly better after the surgery of implantation of total hip endoprosthesis. Statistically significant difference was established in general health before and after the surgery. Before the surgery great limitations in lifting or carrying the load were present in 93% of the examinees, and after the surgery that percentage was only 1%. All the examinees had problems related to physical health before the surgery, after the surgery statistically significant improvement has occurred. Before the surgery 85% of the examinees had difficult emotional problems that disturbed mental normal social activities and after the survey that percentage was 0%. After the surgical procedure 54% of the examinees answered that they had no pain in the body during last 4 weeks.

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