

Assessment of the impact of the rehabilitation procedure on functional and clinical condition of patients with coxarthrosis

Ocena wpływu postępowania rehabilitacyjnego na stan kliniczny i funkcjonalny pacjentów z chorobą zwyrodnieniową stawu biodrowego

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Key words: rehabilitation, coxarthrosis, functional and clinical condition.

Słowa kluczowe: rehabilitacja, choroba zwyrodnieniowa stawu biodrowego, stan kliniczny i funkcjonalny.

Summary

Objectives: Coxarthrosis is one of the most frequent reasons for disability of people at the age of 50 and more. The chronic and progressive nature of this disease makes it a common reason for impairment of the patient's functional and clinical condition. The aim of the study is to assess the impact of the rehabilitation procedure on functional and clinical condition of patients with coxarthrosis measured with the WOMAC and Lequesne Indexes.

Material and methods: The study included 85 patients, among whom 50 patients were treated non-invasively (35 women and 15 men) and 35 were treated surgically (21 women and 14 men). All patients were provided with the physiotherapeutic treatments (point laser therapy power 100 mW dose 8 J, time 12 minutes), kinesiotherapy (the patients did non-weight bearing exercises hip joint exercises, isometric exercises for muscles of the hip), and classical massage. All patients were provided with physiotherapeutic treatments for 10 days, excluding Saturdays and Sundays. The assessment of functional and clinical condition of patients with coxarthrosis was conducted using the WOMAC Questionnaire and the Lequesne Pain Index for the hip joint. The assessment of functional and clinical condition was carried out on the first and the last treatment day.

Results: The rehabilitation procedure significantly improved functional and clinical condition of all patients. The greatest improvements were observed with surgically treated male patients who had been ill for less than 10 years.

Conclusions: The proposed rehabilitation procedure significantly improves functional and clinical condition of patients with coxarthrosis. Disease duration, female sex and non-invasive treatment are factors influencing on the efficiency of rehabilitation for patients with coxarthrosis. The results suggest the necessity of using rehabilitation procedures in patients with coxarthrosis.

Streszczenie

Cel pracy: Choroba zwyrodnieniowa stawu biodrowego należy do najczęstszych przyczyn niepełnosprawności u osób powyżej 50. roku życia. Przewlekły i postępujący charakter tego schorzenia sprawia, że jest ono przyczyną upośledzenia stanu klinicznego i funkcjonalnego pacjentów. Celem pracy była ocena wpływu postępowania rehabilitacyjnego na stan kliniczny i funkcjonalny osób z chorobą zwyrodnieniową stawu biodrowego mierzona indeksem WOMAC (*Western Ontario and McMaster Universities Osteoarthritis Index*) i indeksem Lequesne'a.

Materiał i metody: Badaniem objęto 85 pacjentów, przy czym 50 chorych było leczonych zachowawczo (35 kobiet i 15 mężczyzn), a 35 operacyjnie (21 kobiet i 14 mężczyzn). U wszystkich pacjentów zastosowano zabiegi fizjoterapeutyczne z zakresu fizykoterapii (laser punktowy o mocy 100 mW, dawce 8 J, czas trwania zabiegu: 12 minut), kinezyterapii (ćwiczenia czynne w odciążeniu stawu biodrowego i izometryczne obręczy biodrowej), a także masaż klasyczny okolicy stawów krzyżowo-biodrowych. Zabiegi były wykonywane przez 10 dni z przerwą sobotnio-niedzielną. Badanie oceny stanu klinicznego i funkcjonalnego pacjentów było przeprowadzane przy użyciu kwestionariusza WOMAC i indeksu Lequesne'a w czasie pierwszego i ostatniego dnia zabiegowego.

Wyniki: Postępowanie rehabilitacyjne wpłynęło znamienne na poprawę stanu klinicznego i funkcjonalnego w badanej grupie chorych, przy czym największy efekt uzyskano w grupie pacjentów płci męskiej, leczonych operacyjnie, w której choroba trwała poniżej 10 lat.

Wnioski: Zaproponowane postępowanie rehabilitacyjne znamienne wpływa na poprawę stanu klinicznego i funkcjonalnego osób z chorobą zwyrodnieniową stawu biodrowego. Czas trwania choroby, płeć żeńska oraz leczenie zachowawcze były czynnikami wpływającymi na efektywność rehabilitacji u pacjentów z tym schorzeniem. Uzyskane wyniki potwierdzają konieczność stosowania postępowania rehabilitacyjnego w przebiegu choroby zwyrodnieniowej stawu biodrowego.

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Submitted: 11.07.2013

Introduction

Osteoarthritis is one of the most frequent diseases of the musculoskeletal system. Its widespread occurrence makes it a life style disease. Osteoarthritis is a slowly progressive joint disorder which principally affects the hands and the large weight-bearing joints. The destabilisation of the homeostasis between the cartilage degradation and synthesis processes is the key factor in the pathogenesis of the disease [1, 2].

Aim of the study

The aim of this study was to assess the impact of the rehabilitation procedure on functional and clinical condition of patients with coxarthrosis, taking into consideration such factors as gender, disease duration and type of treatment applied.

Material and methods

The test was conducted in the Independent Public Health Care Centre, Rehabilitation Centre in Suwałki, after a positive opinion by the Bioethics Committee at the Medical University of Białystok (no. R-I-002/424/2011). Eighty-five patients, having given written consent, were tested: 50 patients were treated non-invasively, including 35 women and 15 men, and 35 – were treated surgically, including 21 women and 14 men. The characteristics of patients are presented in Table I.

Table I. Characteristics of studied patients

Parameter	Patients treated non-invasively	Patients treated surgically
number	50	35
gender F/M	35/15	21/14
age (average in years)	62	67
vocational activity:		
working F/M	11/6	2/4
pensioners F/M	4/4	4/3
retirement pensioners F/M	20/5	15/7
disease duration (F/M):		
0–10 years	14/7	1/2
more than 10 years	21/8	20/12
time after surgery (in years)	–	4

All patients were provided with physiotherapeutic treatments for 10 days, excluding Saturdays and Sundays. For physiotherapy, a point diode (semiconductor) laser CTL-1106MX was used with the wavelength of 820 ±10 nm, with a total output power of 100 mW, doses = 8 J frequency 1000 Hz and 12-minute treatment time used for the hip joint areas. For kinesitherapy, the patients did non-weight-bearing exercises. They also performed isometric exercises for muscles of the hip. For therapeutic massage, patients were subjected to classical massage of the sacro-iliac joint areas and the hip joint for 25 minutes.

The assessment of functional and clinical condition of patients with coxarthrosis was conducted on the basis of the WOMAC (Western Ontario and McMaster Universities Osteoarthritis Index) Questionnaire and the Lequesne Pain Index for the hip joint. The test were carried out on the first and the last day of treatment.

Statistical analysis

For comparison of dependent variables, the Wilcoxon paired rank test was applied for two variables. The findings were considered as statistically significant at $p < 0.05$. The statistica 10.0 package by StatSoft was used for calculations.

Results

For both groups of patients, a significant decrease in the WOMAC Index values after applying the rehabilitation procedure in relation to the WOMAC Index value for patients before rehabilitation was demonstrated (Table II). Also, for both groups of patients, a significant decrease in the Lequesne Index values after applying the rehabilitation procedure in relation to the Lequesne Index value for patients before rehabilitation was observed (Table II).

The results of the study indicate that the rehabilitation procedure significantly affects functional and clinical condition of patients with coxarthrosis (Fig. 1).

Both for patients treated non-invasively and surgically, a significant decrease in the WOMAC and Lequesne Index value could be observed after applying the rehabilitation procedure. However, the group of patients treated surgically achieved greater differences within the WOMAC Index after rehabilitation as compared to the patients treated in a non-invasive manner (Figs. 2, 3).

With regard to disease duration, although the rehabilitation procedure had a favourable effect in both groups, the patients with shorter disease duration (less than 10 years) had a greater difference in the both indices (Figs. 2, 3).

Table II. The WOMAC Index and Lequesne Index values before and after rehabilitation in studied groups of patients

Group of patients	N	The WOMAC Index before rehabilitation Me (Q ₁ ; Q ₂)	The WOMAC Index after rehabilitation Me (Q ₁ ; Q ₂)	The Lequesne Index before rehabilitation Me (Q ₁ ; Q ₂)	The Lequesne Index after rehabilitation Me (Q ₁ ; Q ₂)	p level
patients (total)	85	50 (33; 59)	33 (16; 47)	11 (6.5; 14.5)	8 (2.5; 12)	< 0.001
treated non-invasively	50	49.5 (36; 62)	41 (17; 49)	11.5 (7; 16)	8.75 (3.5; 13)	< 0.001
treated surgically	35	50 (28; 58)	32 (10; 45)	9 (4; 13)	6.5 (1; 11.5)	< 0.001
women	56	51 (36; 59)	41 (19.5; 47)	11.5 (7; 15.75)	9.5 (4; 13)	< 0.001
men	29	47 (32; 60)	26 (10; 44)	8 (5; 13.5)	4 (1.5; 9.5)	< 0.001
disease duration (0–10 years)	24	36.5 (30.5; 51)	18 (7; 29)	7.5 (4; 11.75)	2.75 (1.25; 9.25)	< 0.001
disease duration (more than 10 years)	61	52 (38; 60)	42 (26; 47)	11.5 (7.5; 16)	9.5 (4.5; 13)	< 0.001

N – number of patients, Me – median

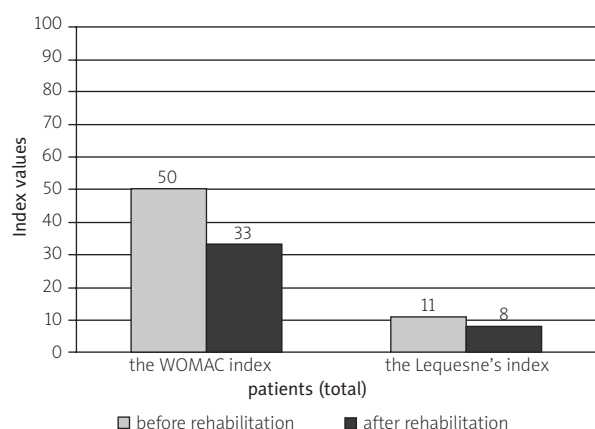


Fig. 1. The WOMAC Index and the Lequesne's Index values before and after rehabilitation in the entire group of studied patients.

The WOMAC and Lequesne Index values were significantly lower after rehabilitation, gender-independently, however, the group of male patients had a greater differences in both indices after rehabilitation as compared to the group of female patients (Figs. 4, 5).

Discussion

Coxarthrosis is one of the main causes of deterioration of life quality resulting from pain and limited joints mobility. Recently, the development of a large number of health-related quality of life measurement instruments has been demonstrated. The WOMAC Index and the Lequesne Index provided valuable information about im-

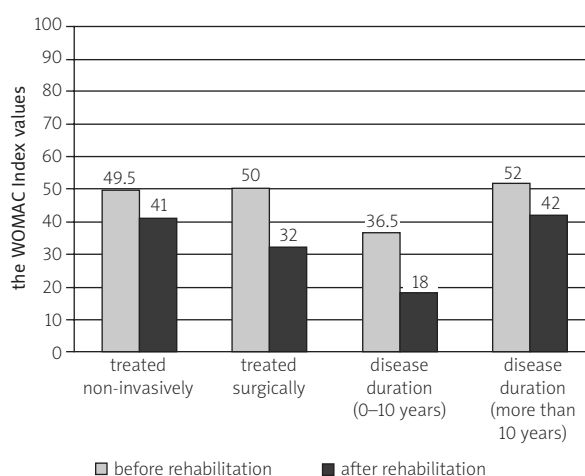


Fig. 2. The WOMAC Index values before and after rehabilitation in relation to treatment and disease duration.

provements in feelings of pain, stiffness and mobility of joints in patients with coxarthrosis [3–6].

The Lequesne Index is used in gonarthrosis, but its modification can also be applied when assessing the functional and clinical condition of patients with the coxarthrosis [5]. It assesses the degree of pain in the joint at rest and during motion. Interesting findings for both indices were presented in a publication by Basaran *et al.* [6] where the correlation between the WOMAC and the Lequesne Index was tested in relation to the hip and knee joint.

Both indices are good tools for measurement to the functional and clinical condition of patients with coxarthrosis. There are many wide-perspective case studies concerning the assessment of the functional and clinical

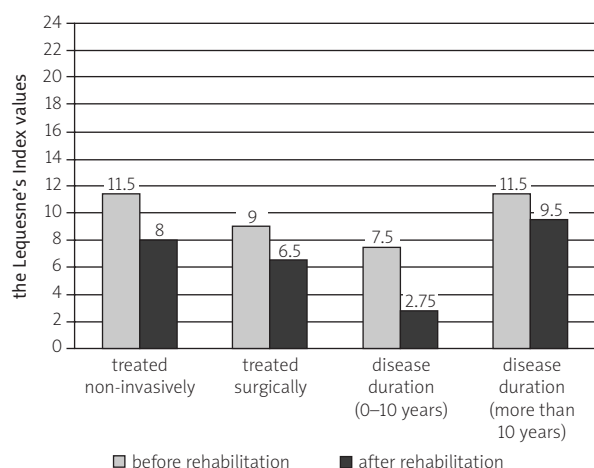


Fig. 3. The Lequesne's Index values before and after rehabilitation in relation to treatment and disease duration.

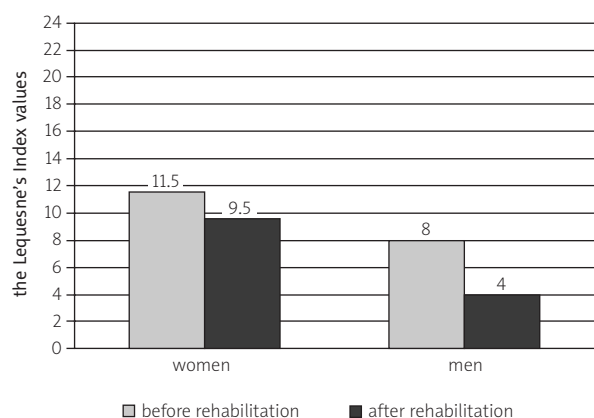


Fig. 5. The Lequesne's Index values before and after rehabilitation in groups of women and men.

condition of patients with the coxarthrosis, but the majority of them mainly refer to the problem of endoprosthetics [7–17]. Recently, an algorithm of physical therapy exercises in patients after total hip arthroplasty has been proposed [18].

Interesting results showing improvement of the functional and clinical condition of patients with coxarthrosis were presented in a publication by Iwaniszczuk and co-authors [19]. The assessment of the impact of physiotherapeutic procedures applied in patients with coxarthrosis, showed significant efficiency of physical therapy that improved functional and clinical condition. It was also observed that non-weight-bearing exercises were a relevant element of the therapy.

Tyborowicz's [20] showed that all groups of patients, independently of the clinical feature and duration of the

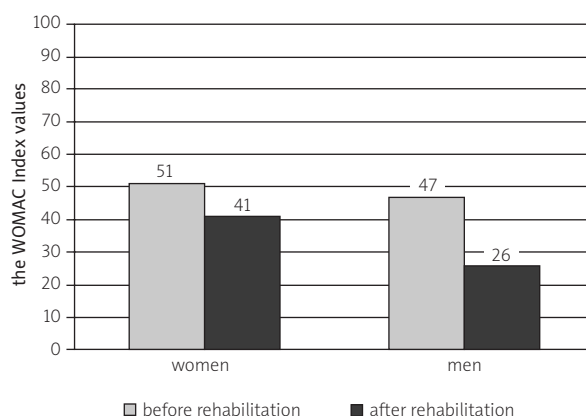


Fig. 4. The WOMAC Index values before and after rehabilitation in groups of women and men.

disease, achieved an improvement in joint's mobility and decrease of pain after exercises. The author points out that a better effect in joint mobility can be achieved when starting exercises at the early stage of the disease.

A positive influence of rehabilitation was reported in a publication by Pop and co-authors [21]. The aim of that study was to assess the effects of sanatorium rehabilitation in patients with coxarthrosis. They found that 80% of patients defined the improvement in their health condition as considerable, 18% as slight and only 3% of patients reported no improvement at all. Improvement was interpreted as improvement in the range of hip joint mobility and decrease in oedema and pain [21].

Interesting results were presented in a publication by Demczyszak and co-authors [22]. The study involved 30 patients aged 61–80 years after total hip replacement. The physiotherapeutic procedure used in their study improved the range of motion of the operated joint.

A positive influence of rehabilitation was observed in a publication by Hawrylak and co-authors [23]. The study group comprised 30 patients, aged 60–75 years, following cementless hip replacement surgery. The physiotherapeutic treatment brought about an improvement of hip joint mobility and the process of maintenance of body balance in the standing position in patients who had undergone hip replacement surgery, thus improving the quality of their lives.

Hagner *et al.* [24] carried out a study aimed at assessing in the significance of early rehabilitation in the recovery process after hip joint's endoprosthesis. The findings led to conclusion that rehabilitation procedure had positive influence on improvement of functional and clinical condition after hip joint endoprosthesis.

Similar conclusions were reached by Golec *et al.* [25]. The authors analyzed 37 literature items dealing with issues of patients' health status improvement after hip joint total alloplastics. They are of the opinion that improvement of functional and clinical condition of patients after hip joint total alloplastics can be achieved not only by choosing invasive surgery, but also by implementation of the rehabilitation procedure.

The findings from the literature on the impact of rehabilitation in coxarthrosis patients were confirmed in our study. The satisfactory improvement of physiotherapy in the treatment strategy of patients suffering from coxarthrosis presented in this report requires further prospective long-term studies in a large group of patients.

Conclusions

1. The proposed rehabilitation procedure significantly improves the functional and clinical condition of patients with coxarthrosis.
2. Disease duration (more than 10 years), female gender and non-invasive treatment are factors influencing the efficiency of rehabilitation for patients with coxarthrosis.
3. The results suggest the necessity of using rehabilitation procedure's in patients with coxarthrosis.

The authors declare no conflict of interest.

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