



A COMPARATIVE ANALYSIS BETWEEN THE RECOVERY RESULTS OF PATIENTS WITH HIP JOINT REPLACEMENT IN THE PERIOD OF EARLY REHABILITATION AT HOME (13-45 DAYS AFTER SURGERY)

Maya S. Krastanova, Danelina Vacheva, Anica Mircheva

Department for Physical Medicine, Rehabilitation, Occupational therapy and Sport, Medical University – Pleven, Bulgaria

SUMMARY:

Rehabilitation of the patients with Hip Joint Arthroplasty is an indispensable part of the functional recovery. **The purpose** of this report is to track and measure the results of an applied complex rehabilitation program during the early post-surgery period in home setting (13-45 days after surgery) and to make a comparative analysis between the recovery results of patients who conducted a comprehensive rehabilitation treatment, and a control group of patients who conducted only early physical therapy and occupational therapy in the hospitalization in the Department of Orthopedics and Traumatology.

Methods and materials: 152 patients (107 female and 45 male) aged between 22 and 84 with Hip Joint Arthroplasty due to osteoarthritis or femoral neck fracture participated in the study, divided into two groups, according to postoperative behavior. The rehabilitation program consists of: kinesitherapy (positional therapy, isometric exercises, movement of the artificial hip joint within the allowed volumes, exercises for upper limbs and the healthy lower limb) and ergotherapy (ergonomic home environment adjusted to performing the daily activities of life). Patients in the second control group have conducted kinesitherapy and occupational therapy only in the early postoperative period in orthopedic clinic.

Results: Locomotion test and DAL test measurements were taken and the results for each patient were stored in a special patient file.

Conclusion: Ensuring an ergonomic home environment and independent practice of kinesitherapeutic and ergotherapeutic stimulate the recovery of the patients' self-reliance significantly improve the psycho-emotional balance and self-respect, and serves as an important basis for the latter stages of rehabilitation.

Key words: endoprosthesis, hip joint, rehabilitation

INTRODUCTION

Hip joint replacement (endoprosthesis, alloplasty) is one of the most successful modern surgery interventions in orthopedics and traumatology [1, 2]. The excellent results from the intervention have stimulated its mass application worldwide, thus significantly increasing the number of patients with endoprosthesis over the last several years [3]. Re-

habilitation of the patients with Hip Joint Arthroplasty is an indispensable part of the functional recovery for patients with endoprosthesis. Conducting proper and timely rehabilitation plays an important role for a more complete recovery and for prevention from complications. Endoprosthesis significant number of patients does not carry out adequate rehabilitation treatment after hospital discharge from the Department of Orthopedics and Traumatology. The reasons for this are mostly financial, social or domestic difficulties. The period of home rehabilitation has a significant impact on the speed and degree of functional recovery for patients with hip joint alloplasty [4]. It ensures avoiding complication and provides a smooth transition to the latter stages of the complex rehabilitation program (CRP) in hospital and ambulatory rehabilitation conditions. The home environment positively affects the psycho-emotional condition of patients, and stimulates their active involvement in the recovery process.

The purpose of this report is to make a comparative analysis of the results of the recovery of patients conducted complex rehabilitation program during the early post-surgery period at home for patients with hip joint endoprosthesis (therapy group – TG) and control group (CG) patients conducted only early physical therapy and occupational therapy in the hospitalization in the Department of Orthopedics and Traumatology.

The tasks required for that are:

1. To apply the CRP, consisting of kinesitherapy and ergotherapy, during the period of early rehabilitation at home (13-45 days after surgery).

2. To administer tests and measurements for the locomotion and DAL (daily activities test for clothing and personal hygiene) at the beginning and at the end of the observed period, and to store the results in an individual file for each patient.

3. To analyze the results and provide patients with instructions for the following stages of the rehabilitation process.

METHODS AND MATERIALS:

In the study participated 152 patients (107 female and 45 male) aged between 22 and 84 with hip joint endoprosthesis due to osteoarthritis or femoral neck fracture, divided into two groups, according to postoperative behavior: - TG includes 80 patients conducted a one-year com-

prehensive rehabilitation in the Department of Physical Medicine and Rehabilitation at University Hospital “Dr George Stranski” Pleven.

- CG includes 72 patients, doing kinesitherapy and occupational therapy only in the early postoperative period in Orthopedics and Traumatology Clinic.

All of them had surgery at the Orthopedics and Traumatology Clinic (COT) at UMBAL “Dr George Stranski”, Pleven, between 2012 and 2015. The methods of the applied rehabilitation have been developed at the Clinic for physical and rehabilitation medicine more than 30 years ago, and have been consistently updated and improved over the years. The aim of the early period rehabilitation at home is to stabilize the gait with the help of walking aids, and to improve self-service. The rehabilitation program for each patient is based on what they have learned during their stay at the COT, and is adjusted to the physical and functional possibilities of the patient.

Upon discharge from COT, all patients receive written instructions for applying kinesitherapy and ergotherapy at home. The instructions include movements and activities which should be avoided for the rest of the patients’ lives, as well as guidelines for home rehabilitation which the patients have to perform independently [5, 6].

- Early post-surgery rehabilitation at home for the Patients in the therapy group (TG) begins immediately after the patient’s discharge from COT from the moment of transporting the patient back home. Careful and correct seating in the vehicle (most often a car) on the seat next to the driver is required, while observing the prohibited movements. At this stage the patient must be already able to walk properly with walking aids and to get up and down stairs, but if it’s not possible and there is no elevator in the building, then the patient will need help with that [7].

• Kinesitherapy for the period includes all the activities from the early post-surgery period: positional therapy, isometric exercises for the gluteal and hip muscles, analytical exercises and movement of the artificial hip joint within the allowed volumes, exercises for the shoulder muscles, upper limbs and the healthy lower limb [8,9].

• Ergotherapy includes ensuring an ergonomic home environment which is adjusted to prevent from falling and complications, increasing the movements and physical activities of the patients and performing the daily activities of life (DAL). For patients who are still not fully accustomed to walking with aids for some reason (due to age, psychological issues, complications or other illnesses), it is strongly recommended that they receive help at home from a rehabilitation specialist. Unfortunately this is not regulated and financed by the healthcare system [6].

- Patients in the control group conducted only in the early postoperative period in Orthopedics and Traumatology Clinic:

• *Kinesitherapy*: includes positional therapy; isometric exercises for the gluteal and thigh muscles; active exercises against resistance, exercises for the shoulder girdle, upper limbs and contralateral lower limb, gradual mobilization of prosthetic reconstructed hip joint, proprioceptive neuromuscular ease (PNME); verticalization in several

stages; training with walking aids – two axillary crutches only in the period of early rehabilitation.

• Occupational therapy - daily life activities includes “clothing and footwear” with a “toilet and maintain personal hygiene.”

RESULTS:

The results from the performed tests and measurements are stored in an individual patient file which is specifically designed for the purpose, and the W-test of Mann-Whitney (Wilcoxon) is applied to analyze the gathered data [10]. For the purposes of this study we performed the DAL test (graded from 0 to 5, developed by H. Rusk, 1964) “clothing and personal hygiene” test (using the restroom, washing hands and face, tooth brushing, hair combing and shaving – for men) and a locomotion test – number of steps per 10 meters, total distance and movement speed [11, 12].

Figure 1 represents the data from the median values of the number of steps taken per 10 meters in both treatment groups. The results show that with improving the overall condition of the patients in the therapy group (TG), the number of steps decreases.

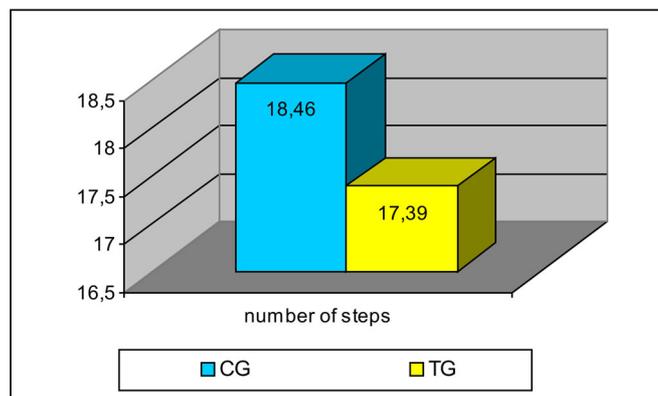


Fig. 1. Median values of the number of steps taken per 10 meters in both treatment groups

Figure 2 displays the results of the median arithmetic values for movement speed (measured in seconds) for 10 meters at the beginning and at the end of the observed period in both treatment groups. The time required for the task decreases, demonstrating a higher improvement in the patients’ functional recovery in the TG.

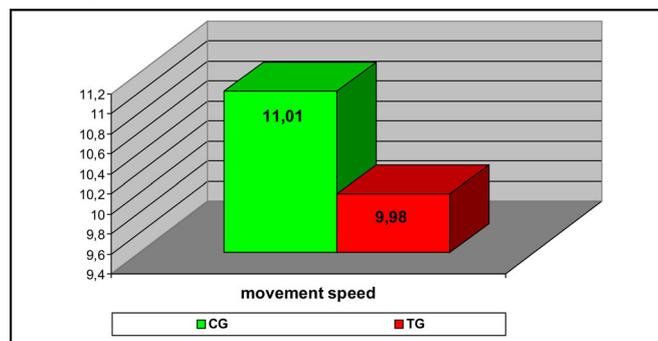


Fig. 2. Results of the median arithmetic values for

movement speed (measured in seconds) for 10 meters in both treatment groups

Figure 3 shows the Wilcoxon curve for the median arithmetic values for the DAL “clothing and personal hygiene” test at the beginning and at the end of home rehabilitation period. The curve shifts to the right, which shows improvement in the patients’ self-reliance and independence in the TG.

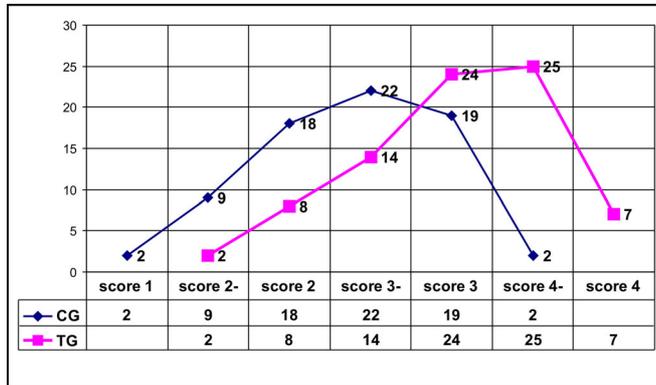


Fig. 3. The Wilcoxon curve for median arithmetic values for the DAL “clothing and personal hygiene” test before and after Rehabilitation

REFERENCES:

- Donatelli R, Wooden MJ. Orthopaedic physical therapy. 4th edition, St. Louis: Churchill & Livinstone. 2010; 400-498. [Internet]
- Dreinhöfer KE, Dieppe P, Puhl W. Conclusion: Where do we go from here?. In: Dreinhöfer KE, Dieppe P, Günther KP, Puhl W. (Eds.) EUROHIP: Health Technology Assessment of Hip Arthroplasty in Europe. Springer Berlin Heidelberg. 2009. p.145-146. [CrossRef]
- Tivchev P, Kinov P, Jotov A, Asparuhov A, Takov E, Valeshkov J, et al. Arthroplastik of the Hip Joint. Sofia: BG Kniga. 2014; 37-57, 68-72 [In Bulgarian].
- Iotov A, Rusimov V. [Current aspects in hip and knee joint replacement] [in Bulgarian]. *Physical Medicine, Rehabilitation and Health*. 2013; 12(2):3-15.
- Ilieva E. [Features of rehabilitation and occupational therapy after hip arthroplasty.] [in Bulgarian] *Physical medicine, rehabilitation, health*. 2007; 6(4):14-18.
- Ilieva E. Occupational Therapy in endoprosthesis. In: Topuzov I. (ed). Occupational Therapy. part II. Sofia: Simel. 2008, 193-220 [in Bulgarian].
- Kisner C, Colby LA. Therapeutic Exercise: Foundations and Techniques, 6th Edition. FA. Davis Company. (October 2, 2012) 191-203; 643-686.
- Karaneshev G, Venova L. [Guide to practical exercises in remedial gymnastics.] [in Bulgarian] *Sofia: Medicina i Fizkultura*. 1991; p.26-78.
- Brander V, Stulberg SD. Rehabilitation after hip- and knee-joint replacement. An experience- and evidence-based approach to care. *Am J Phys Med Rehabil*. 2006 Nov;85(11 Suppl):S98-118. [PubMed] [CrossRef]
- Velkova D. [Health and social problems of the elderly people living alone in the villages.] [In Bulgarian] *Dissertation. Pleven*. 2000.
- Vacheva D, Mircheva A. [Medical rehabilitation and occupational therapy of patients with hip joint arthroplasty] [in Bulgarian]. *Management and Education*. 2013; 9(5):29-32.
- Cook CE, Hegedus EJ. Orthopedic Physical Examination Tests: An Evidence-Based Approach. 2nd Edition. Pearson. (January 9, 2012) 93-99.

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Address for correspondence:

Dr Maya Krastanova, MD, PhD. Clinic of Physical and Rehabilitation Medicine, University Hospital “Dr Georgi Stranski” Pleven, 8A, Georgi Kochev str., 5800 Pleven, Bulgaria.
Tel.: +359/64/886 174; +359/896 873 272
E-mail: krastanova.1962@abv.bg

CONCLUSIONS:

- A positive and quantifiable influence is observed on the functional recovery of the patients, returning to their self-reliance for daily tasks, and the occurrence of patients going into a depressive state of mind.
 - The decreased number of steps and time required for patients with hip joint endoprosthesis to walk 10 meters demonstrates an improvement in the locomotion and their functional recovery after the rehabilitation course.
 - The shift of the Wilcoxon curve to the right for the DAL test shows improvement in the ability of patients to take care of themselves for the majority of the patients.
 - The adaptation of the home environment to the needs of the patients and performing rehabilitation during the early post-surgery period at home help patients avoid potentially harmful movements and activities, maintain the muscle strength of their torso and limbs, and contribute positively to the overall physical and psychological condition of the patients with endoprosthesis.
- Performing rehabilitation during the early post-surgery period at home leads to faster functional recovery for patients with hip joint endoprosthesis.