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ORIGINAL ARTICLE

Role of Rehabilitation and Physical Therapy in Optimizing Outcomes after Joint Replacement Therapy

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ABSTRACT

Aim: The objective of the current investigation was to evaluate the role of rehabilitation and physical therapy in optimizing outcomes after joint replacement therapy.

Patients and Methods: This study retrospectively investigated 78 patients underwent joint replacement therapy in**,** Department of Orthopaedic Surgery, SKBZ/CMH Muzaffarabad, AJK March 2022 to April 2023. Patients of either gender aged 60-80 years, requiring unilateral total hip or knee arthroplasty for Osteoarthritis were included. Pre-operative physical therapy, option of anesthetic technique, early mobilization, reduction of urinary retention and catheterization, risk of deep vein thrombosis, and blood loss were the primary aspects of investigation. Length of stay (LOS), complication rate, and re-admission were primary outcomes. SPSS version 26 was used for data analysis.

Results: Of the total 78 patients, the incidence of knee and hip joint replacement was 49 (62.8%) and 29 (37.2%), respectively. The overall mean age and LOS was 68.8±4.62 years and 4.2±1.7 days, respectively. About 73 (93.6%) patients had post-operative satisfaction (score >7). All the patients underwent joint replacement therapy were completely discharged, out of which physical therapy was continued complete autonomy, home-physiotherapist, and routine attendance in physiotherapy center in 46 (59%), 18 (23.1%), and 13 (16.9%), respectively. The prevalence of major complications was 10.3% (n=8).

Conclusion: Rehabilitation and physical therapy enhanced the reduction in hospitalization stay, early patient's discharge, and fast recovery to routine activities.

Keywords: Joint replacement therapy, Rehabilitation, Physical therapy

INTRODUCTION

Osteoarthritis (OA) emerges as major global contributor to disability among elderly patients. The prevalence of OA, especially in joint replacement therapy, has been growing over the past few years, affecting 25% individuals with age range 60-85 years[1]. OA results in substantial interference in routine activities, overall health status, and impairing quality of life. In light of the growing cases of OA and cost associated with management, OA imposed huge economic burden on healthcare facility[2]. An earlier studies conducted in Germany and USA reported that the incidence of OA reported in male and females of age 40-65 years and >65 years were 23.3% and 16.6% and 48.1% and 31.2%, respectively[3,4]. Joint replacement therapy is the preferred choice of treatment for knee or hip OA, which cause reduction in quality of life, socioeconomic impact, and individual disability. This procedure assist in mitigating the complications, pain, and restore mobility[5,6].

Following the total knee arthroplasty (TKA) and total hip arthroplasty (THA), rehabilitation and physical therapy significantly focused on the recovery, shorter hospital stay, muscle strength, range of motion, neuromuscular function, stretching, and proprioception recovery. Total knee arthroplasty are not always optimal choice for optimizing the clinical outcomes, but rehabilitation and physical therapy are alternate rehabilitation approaches required[7]. Despite the general effectiveness of physical therapy after knee and hip arthroplasty, there is a need for economically viable rehabilitation options that can provide it medium- and long-term consequences have been significant[8,9]. Several postoperative interventions have been investigated; including inpatient rehabilitation, hospital rehabilitation, hydrotherapy, telerehabilitation, home exercises, and techniques is rapid but cannot determine the most effective strategy for optimizing function after hip and knee arthroplasty. In addition, there is insufficient evidence to determine what types of exercises can be safely encouraged without compromising transplant survival. Therefore, the present study aimed to evaluate the role of rehabilitation and physical therapy in optimizing outcomes after joint replacement therapy.

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METHODOLOGY

This study retrospectively investigated 78 patients underwent joint replacement therapy in Department of Orthopaedic Surgery, SKBZ/CMH Muzaffarabad, AJK March 2022 to April 2023. Patients of either gender aged 60-80 years, requiring unilateral total hip or knee arthroplasty for Osteoarthritis were included. Obese patients (<20-30 Kg/m^2) with severe systemic disease were excluded. Additionally, presence of severe cardiac failure or any chronic obstructive pulmonary disease were also excluded. After the initial evaluation, these individuals were referred for further evaluation, including ECG, anesthesia testing, standard joint plain X-ray (double check), blood tests, and chest x-ray. This facilitated patient adherence and served as a means of providing information to health care providers. A pneumatic tourniquet was used for knee surgery, and a medial parapatellar approach was used for all patients. Hip surgery, on the other hand, involved posterior lateralization of patients. The use of catheters reduced to reduce the risk of tissue damage. Intraoperative treatment includes maintenance of body temperature with air-conditioned blankets, warm intravenous medications, prophylaxis with cefazolin (or clindamycin and vancomycin). for patients who have received cephalosporin), and dexamethasone 4 mg and ondansetron 4 mg pain relief with paracetamol and ondansetron 4 mg antibiotics ketoprofen is initiated. Tranexamic acid at 20 mg/kg was administered after injection.

Demographic data including age, gender, body mass index (BMI), duration of tourniquet (for TKR), preoperative and postoperative hematocrit and hemoglobin levels were collected, day of discharged, and any complications systematically. Additionally, each patient was given a satisfaction questionnaire prior to discharge. The degree of satisfaction with the completeness of the experience was measured, with a scale ranging from 1 (dissatisfied) to 10 (completely satisfied). Pre-

operative physical therapy, option of anesthetic technique, early mobilization, reduction of urinary retention and catheterization, risk of deep vein thrombosis, and blood loss were the primary aspects of investigation. Length of stay (LOS), complication rate, and re-admission were primary outcomes. The 6-moths follow up plan was as follows; After 1 month postoperatively, the plan includes a review of joint X-rays and an updated exercise protocol. At the 3-month mark, the focus shifts to evaluating joint range of motion (ROM) and reducing muscle strength exercise guidelines. By 6 months in particular, further x-ray examination together with biomechanical examination.

SPSS version 26 was used for data analysis. Numerical variables were expressed as mean and standard deviations whereas categorical variables were described as frequency and percentages. Differences between groups Symptoms were assessed among participants Independent t-test (age, weight, BMI) and Fisher's exact test (sex, joints) by taking 95% confidence interval and 5% level of significance.

RESULTS

Of the total 78 patients, the incidence of knee and hip joint replacement was 49 (62.8%) and 29 (37.2%), respectively. The overall mean age and LOS was 68.8±4.62 years and 4.2±1.7 days, respectively. About 73 (93.6%) patients had post-operative satisfaction (score >7). All the patients underwent joint replacement therapy were completely discharged, out of which physical therapy was continued complete autonomy, home-physiotherapist, and routine attendance in physiotherapy center in 46 (59%), 18 (23.1%), and 13 (16.9%), respectively. The prevalence of major complications was 10.3% (n=8). Figure-1 demonstrate the patient's distribution in groups. Different preoperative demographic details are shown in Table-I. Post-operative complication are depicted in Figure-2. Different types of rehabilitation and physical therapy are shown in Table-II.

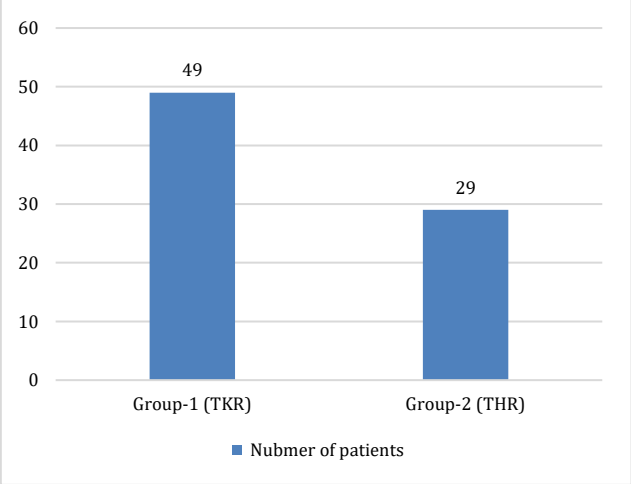

Figure-1: Patient's distribution in groups

Table-1: preoperative demographic details

Parameters	Group-I (N=49)	Group-II (N=29)
Age (years)	70.8±6.58	66.8±2.66
Gender N (%) Male Female	 17 (34.7%) 32 (65.3%)	 12 (41.4%) 17 (58.6%)
Body mass index (Kg/m2)	30.8±2.3	29.8±1.9
Length of hospital stay (days)	4.2±1.7	4.2±1.7
Operative side (right)	25 (51%)	16 (55.2%)
Operative times ASA 1 ASA 2 ASA 3-4	 7 (14.3%) 30 (61.2%) 12 (24.5%)	 4 (13.8%) 15 (51.7%) 10 (34.5%)

Table-2: Rehabilitation and physical therapy (N=78)

Type of therapy	N (%)
Complete autonomy	46 (59%)
Home-physiotherapist	18 (23.1%)
Routine attendance in physiotherapy center	13 (16.9%)

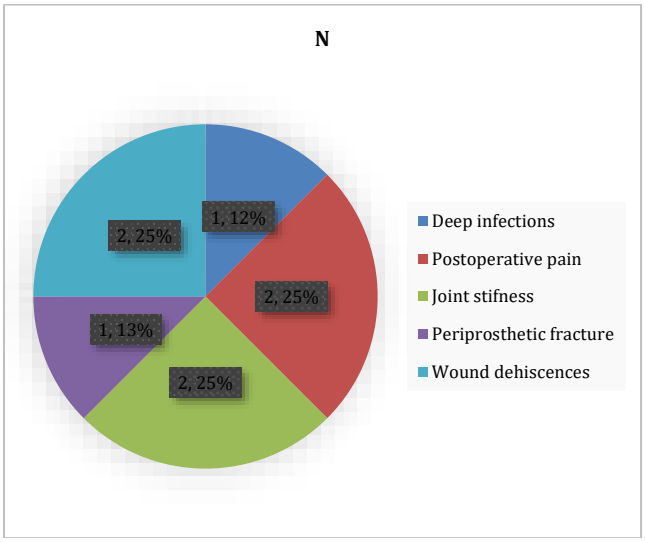

Figure-2: Post-operative complications

DISCUSSION

The present study mainly focused on the role of rehabilitation and physical therapy in optimizing outcomes by investigating 78 patients underwent joint replacement therapy and reported that rehabilitation and physical therapy enhanced the reduction in hospitalization stay, early patient's discharge, and fast recovery to routine activities. The main results of the study show a significant reduction in length of hospital stay (LOS) along with an increase in patient satisfaction, all achieved without an improvement in complication rates compared to the previous standards. Notably, hospital LOS was significantly reduced for total hip replacement (THR) and total knee replacement (TKR) procedures compared with our previous criteria. Hospital LOS has been reduced to less than 4 days, while maintaining complication rates similar to those used before the protocol and consistent with findings from the earlier studies[10-13].

Physicians and patients are having consensus about the importance of rehabilitation after total knee arthroplasty (TKA). Many studies suggest or support specific rehabilitation measures. Most of these studies have considerable clinical relevance due to their reliance on broad patient cohorts, case-control groups, strong user experience and globally accepted treatments but literature a comprehensive review of the species revealed deficiencies in evidence-based policies[14,15]. Those patients included appropriately in order to balance, incorporate the first steps, meat and credentials, and relief with the customs to decrease the best results for a long time. Early stages are recommended, such as deep tissue tenderness, pneumothorax, and skin lesions. Furthermore, early postoperative rehabilitation can benefit from the prevention of knee stiffness. Knee stiffness after total knee arthroplasty (TKA) is a concern requiring aggressive rehabilitation and possible hospitalization, as preoperative ROM is a factor especially to be considered in the prevention of atherosclerosis but to our knowledge, high-quality research examining the timing and optimal strategies is lacking post-TKA stiffness management[16].

Total hip arthroplasty (THA) and total knee arthroplasty (TKA) are the most common surgeries. However, there is no consensus on the best postoperative exercises and exercises most effective for optimal recovery. This systematic review aimed to explore existing evidence of the effects of exercise and

rehabilitation on the clinical outcome of patients after hip and knee arthroplasty[17].

An important aspect is the preoperative preparation and training of the patients, with a multidisciplinary approach prior to admission designed to facilitate the preoperative work environment. The efficacy of the enhanced recovery after surgery (ERAS) program relies on a multidisciplinary approach to accurately coordinate hospital discharges and address issues that may prevent timely discharge. ERAS can be viewed as a collection of evidence-based interventions. Currently, there is no "magic combination" that is universally applicable, and each organization must use the best combination of materials tailored to their unique circumstances and operating procedures.

The preoperative rehabilitation literature tends to acknowledge the many benefits of preoperative interventions, especially when exercise is integrated into education. For more frail patients, a multidisciplinary approach is often recommended. In addition, occupational therapy and patient education can increase adherence to subsequent treatment. The effectiveness of preoperative rehabilitation programs has been associated with improved strength in the affected leg, decreased leg strength asymmetry, and increased function before knee arthroplasty total complexity results have always been associated and has the ability to increase heat, which is a good indicator of functional recovery in the postsynapsis. Studies have demonstrated the benefits of pre-residential neuromuscular electrical stimulation to accelerate return to normal activities in patients undergoing TKA for knee osteoarthritis[19-21].

Overall, enhanced rehabilitation programs and expedited surgery after total knee arthroplasty (TKA) demonstrated displacement of primary and secondary outcomes effectiveness has been demonstrated, emphasizing the importance of rapid recovery of muscle function and joint sensation related to implant surgery and coupling For this reason, physicians who surgery is advised against engaging in high-impact, high-activity sports. However, current evidence suggests that such activities contribute to improved clinical outcomes in older patients, particularly in terms of range of motion (ROM), pain, rate of revision and knee injury and osteoarthritis outcome scores (KOOS) scores[22-24].

Several authors have published that exercise does not increase the risk of revision after joint replacement surgery[25,26]. Furthermore, one study showed that participation in moderate sports activities could increase bone alignment, decreasing bone turnover and facilitating bone prosthesis[27]. Thus, they stop these findings encourage orthopedic surgeons to recommend exercise and participation in moderate-to-moderate sports activities posterior joint replacement.

CONCLUSION

It has been observed that Rehabilitation and physical therapy enhanced the reduction in hospitalization stay, early patient's discharge, and fast recovery to routine activities. Future studies should focus on optimizing rehabilitation and exercise programs to improve patients' rehabilitation and quality of life in the early period after joint replacement therapy.

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