

Original Research Article

Clinical Outcomes Following Total Knee Replacement

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Article History

Received: 17.06.2022

Accepted: 22.07.2022

Published: 27.07.2022

Journal homepage:

<https://www.easpublisher.com>

Quick Response Code



Abstract: *Introduction:* Total knee replacement (TKR) is commonly carried out in patients with advanced osteoarthritis to reduce pain and increase. The study aimed to investigate functional outcomes after Total Knee Replacement (TKR) among orthopedic patients at Babcock University Teaching Hospital, Ogun, South West, Nigeria. *Methods:* Registry data of patients who underwent TKR between January 1st, 2021 to December 30th, 2021 were collected and retrospectively reviewed. Sociodemographic and anthropometric data together with the Oxford Knee Score (OKS) were collated both preoperatively and postoperatively (12 weeks after surgery). *Results:* There was significant increase in the OKS postoperatively, which was statistically significant. There was significant difference between pre-operative OKS and post-operative OKS ($p=0.0049$). *Conclusion:* Overall, there was clinically significant change in the OKS after surgery. This implies greater reduction in pain and increase functional outcomes.

Keywords: Total knee replacement, outcome measure, oxford knee score.

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INTRODUCTION

Osteoarthritis (OA) is a major degenerative disease that affects over 250 million individuals worldwide [1]. The incidence and prevalence of osteoarthritis are growing as a result of the increasing prevalence of risk factors such as increased life expectancy, obesity, aging, and joint traumas [2]. Severe pain, stiffness, and instability in the afflicted joint(s) are possible symptoms [3, 4]. Because there is no known cure and symptoms tend to worsen over time, osteoarthritis can have a debilitating effect on a person's health and functioning [2, 4], especially when conservative management fails to slow disease progression [5, 6].

OA is a significant contributor to the worldwide health burden (Hunter and Bierma-Zeinstra, 2019) and one of the leading causes of global disability [7-9]. In the future years, global economic and societal expenses are likely to climb [9, 10]. Pharmaceutical and non-pharmacological interventions, surgeries, emergency department visits, and long-term care are all examples of direct expenditures [11, 12]. The projected share of gross domestic product linked with osteoarthritis-related medical expenses in high-income nations ranges from 1 to 2.5 percent [11].

In industrialized countries, TKR is becoming a more prevalent surgical therapy for end-stage osteoarthritis of the knee. Since John Install and colleagues implanted the first complete condylar prosthesis in 1974, TKA has evolved. When all other alternatives for conservative therapy have been explored, TKR is commonly recognized as the treatment of choice for patients with knee OA [13]. TKR is the second most common form of orthopedic surgery, with projections predicting a six-fold rise in primary TKRs in North America over the next few decades [14]. The majority of patients will experience significant improvements in pain, disability, and health-related quality of life after TKR [15]. The purpose of this study was to determine the functional outcomes of patients who received TKR at a teaching hospital in southwest Nigeria using the Oxford Knee Score Scale.

METHODS

We conducted a retrospective cohort study by manually reviewing and extracting electronic medical records on patients with bilateral Knee OA who underwent TKR at Babcock University Teaching Hospital, Nigeria. A total of 19 patients underwent TKA who met operative indications between January 1st, 2021 to December 30th, 2021. These surgeries were

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performed by a total of 3 surgeons at this facility. The procedure gained popularity in the teaching hospital in early 2019 and from then till date, over 60 TKR s have been performed with good outcomes. The procedure usually done under combined spinal and epidural anesthesia usually lasts for 2 hours. With a longitudinal incision and a medial parapatela approach to the knee, the different cuts are made to the distal femur and proximal tibia and sizing done. The appropriate femoral and tibia components applied with bone cement after appropriate trial. The tibia insert then applied and irrigation done before closure. Patients usually begin ambulation and rehabilitation from next day. Each patient signed a written informed consent for while the Babcock University Health Research Ethics Committee (BUHREC) accepted the study procedure.

A midline, medial parapatellar approach was performed using surgeon preferred instrumentation and implants. All patients were managed with a standardized surgeon specific rehabilitation protocol both pre and post operatively. Preoperative data including patient demographics, and laterality were obtained. Subjects were included if they were 50 to 75 years of age, diagnosed with bilateral knee OA, suitable to receive the implant under study, able to comprehend the study, gave voluntary informed consent, and willing to perform all study procedures and follow-up visits. Patients undergoing TKA were excluded if they had BMI greater than 35 kg/m², significant neurologic impairments, ligament laxity, significant contralateral knee OA (as defined by pain greater than 4/10 with activity), or other unstable, lower extremity orthopedic conditions.

Outcome measures and data collection

Oxford Knee score scale (OKS) was used to assess the functional outcomes and severity of pain before and after (3 months) surgery respectively. The Oxford Knee Score (OKS) is a validated questionnaire specifically developed to assess patients' pain and function status after knee arthroplasty [16]. The OKS consists of 12 questions, each rated at five levels, ranging from 0 (severe) to 4 (none). The scores were

totalled to give an overall score, where 0 is the worst possible score and 48 is the best possible score. An overall OKS of above 41 can be considered 'excellent', above 34–41 as 'good', above 27–34 as 'fair', while 27 or below is a 'poor' score [17].

Statistical analysis

The Statistical Package for the Social Sciences for Windows version 26 was used to analyze the data (SPSS Inc., Chicago, IL, USA). The mean, standard deviation (SD), median were used to express the data. The histogram, Q-Q graph, and Kolmogorov-Smirnov and Shapiro-Wilk tests were used to determine if quantitative values had a normal distribution. The Wilcoxon signed rank test was performed for the paired observations since the variables were not regularly distributed. A statistically significant p value of 0.05 was used.

RESULTS

Demographic characteristics of the study population are shown in Table 1. A total of 26 patient's record diagnosed of knee OA and underwent TKA were extracted. 7 patients were excluded from the study due to incomplete records. The remaining 19 patients, 5 males (26.3%) and 14 females (73.7%) who completed the study were analyzed. The mean age, weight and height of the patients were 63.68 ± 6.507 years, 74.20 ± 10.56 kg and 1.10 ± 0.32 m respectively (Table 1). Table 2 showed the mean score for pre and post OKS were 8.11 ± 2.18 and 38.42 ± 6.86 respectively.

Table 1: Patient characteristics

	N (%)	Mean ±SD
Age (years)		63.68 ± 6.507
50-60	7(36.9)	
61-70	10(52.6)	
71-80	2(10.5)	
Gender		
Female	5(26.3)	
Male	14(73.7)	
Weight		74.20±10.56
Height		1.20±10.31

Table 2: Pre and post-operation scores of NPRS and OKS

	OKS Mean ±SD	Sig
Pre surgery	8.11 ± 2.18	0.049
Post-surgery (3 months)	38.42 ± 6.86	

DISCUSSION

The TKR has had good outcomes in recent years, and it is now one of the most often done surgeries worldwide. The primary goal was to establish the clinical results of individuals who had TKR surgery. Readmission problems, wound infection, thromboembolic events, sepsis, and implant loosening/failure were not observed. Before surgery, the OKS ratings were significantly lower (Range: 4, 12).

This might be due to a functional impairment of the knee, which causes discomfort and limits daily tasks including walking, sitting, and traversing stairs. The capacity to squat for cultural and religious purposes is crucial in a Nigerian people, but it is impossible with one or more tight knees [18, 19]. TKR has become the standard of care for these stiff and painful knees. However, TKR is technically difficult, and the risk of problems such as implant failure, infection, and skin flap necrosis, among others, is not trivial [20], and can

be as high as 29% [21]. TKR can however, provide pain alleviation and improved function [13]. The mean OKS scores improved significantly. Patients reported considerable improvement in pain and functional results three months following surgery (mean=38.42 6.86). The Wilcoxin sign ranking test, a non-parametric test, indicated a statistically significant difference in mean scores before and after TKR (p=0.049). Other research found that the majority of patients improved their OKS following TKR, with the mean post-operative OKS being similar to this study [21, 22].

LIMITATIONS OF THE STUDY

This research was not without flaws. 12 cases were excluded due to incomplete records, resulting in a complete loss rate of 38.7%.

CONCLUSION

This study addressed the clinical outcome of patients before and after TKR. This study could help guide clinicians in counselling patients on management options for osteoarthritis, including TKR. By providing information to help patients form more realistic expectations of outcomes after surgery, patients could give more informed consent, and potentially increase their functional outcomes.

ACKNOWLEDGEMENTS

This study would not have been feasible without the medical records department of Babcock University Teaching Hospital.

Funding: None

Conflict of interest: None declared

Authors' Contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Citation: Kelechukwu Onuoha, Taiwo Aofolajuwonlo, Akinola Bolarinwa, Salami F. Omotayo (2022). Clinical Outcomes Following Total Knee Replacement. *EAS J Orthop Physiother*, 4(3): 16-19.