

EVALUATION OF GAIT, FUNCTIONAL MOBILITY, AND QUALITY OF LIFE OF PATIENTS UNDERGOING KNEE ARTHROPLASTY: A CROSS-SECTIONAL STUDY

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INTRODUCTION

Knee osteoarthritis, a common and progressive condition, is characterized by changes in articular cartilage and other anatomical structures (Primorac et al., 2020). Of congenital or acquired etiology, excess load (acute or chronic) or a combination of these (Felson et al., 2013). Cause of pain, functional limitation, and consequent decrease in quality of life (Silverwood et al., 2015).

Knee arthroplasty is a surgical alternative for restoring joint function and quality of life in these patients (Argenson et al., 2013; Benedetto et al., 2019). For the evaluation of knee functional restoration and patient quality of life, objective and subjective modalities are available (Unnanuntana et al., 2018). The objective assessment of gait with inertial sensors has a significant correlation with the findings of performance tests and quality of life questionnaires and outcomes (Youn et al. 2020).

The objective of this work is to evaluate the gait, functional capacity, and quality of life of patients undergoing primary knee arthroplasty between two types of knee prostheses: posterior stabilized with a fixed tibial plateau base and congruent rotating tibial plateau prosthesis for the treatment of advanced knee osteoarthritis.

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METHODOLOGY

Diseño

Cross-sectional study is approved by the Research Ethics Committee of the Evangelical University of Goiás, under process number 52052421.9.0000.5076, was conducted at the Evangelical University of Goiás- UniEVANGÉLICA in partnership with the State Center for Rehabilitation and Readaptation Dr. Henrique Santillo – CRER.

PARTICIPANTS

The subjects were selected from the Dr. Henrique Santillo State Rehabilitation and Readaptation Center - CRER. The sample consists of 54 patients who underwent total knee arthroplasty, for which, based on the results of a repeated measures analysis of variance by Tsubosaka et al. (2020) with a minimum difference between treatment means of .2, a standard deviation of .3, we used a test power of 80% and an alpha of .05. The result for the sample size was 54.

ELIGIBILITY CRITERIA

The inclusion criteria were subjects: a) underwent unilateral primary knee arthroplasty; b) with advanced knee osteoarthritis classified as Kellgren and Lawrence ≥ 4 ; c) aged 50 to 80 years; d) underwent knee arthroplasty surgery with a fixed tibial plateau prosthesis or a rotating plateau without preservation of the posterior cruciate ligament; e) agreed to participate in the study by signing the Informed Consent Form. The exclusion criteria were subjects: a) with neurodegenerative diseases, b) secondary osteoarthritis, c) who had previous knee surgeries, d) with a history of knee fracture within the last 12 months, e) previous hip arthroplasty, f) with a history of pre or post-operative infection, g) with comorbidities that prevent adequate post-operative recovery and rehabilitation, h) who underwent knee revision arthroplasty.

EVALUATION PROTOCOL

The evaluation consisted of screening and the assessment protocol with the inertial sensor using the 2-minute walk test - 2MWT and the applied WOMAC

questionnaire. The assessment of functional capacity was conducted using the validated 2MWT test, where subjects walked at their normal speed along the designated course without stops for 2 minutes. (Unnanuntana et al., 2018). The evaluation of the postoperative outcome reported by the patient was conducted using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) questionnaire, a globally recommended self-assessment questionnaire answered by the patient for clinical research on knee osteoarthritis (Lage et al., 2020).

Since the data did not show a normal distribution as analyzed by the Kolmogorov-Smirnov test, a Mann-Whitney test was conducted to see where the difference in functional mobility (WOMAC and 2MWT) lies with respect to the type of knee prosthesis (fixed or rotating).

RESULTS

A total of 57 people from the CRER database were screened in this study, between June 2022 and July 2022, and 03 did not meet the eligibility criteria. Thus, 54 people were evaluated, with their clinical and anthropometric characteristics presented in Table 1, which did not show a statistical difference among them ($p > 0.05$). Table 2 presents the data of the medians and their respective interquartiles of the 2MWT and WOMAC, in which no difference was evidenced between the type of prosthesis.

Table 1. Clinical Characteristics

PARTICIPANTS	TOTAL	54
SEX	FEMININE	32
	MASCULINE	22
MIDDLE AGE	67.81 years	
AVERAGE WEIGHT	79.1kg	
AVERAGE HEIGHT	1,61m	
Average BMI	30,73	
LATERALITY	LAW	20
	LEFT	24
IMPLANT	FIXED PLATEAU	30
	ROTARY TABLE	24
PO MÉDIO	17.31 months	

Source: Authors

BMI: Body Mass Index; **PO:** postoperative

Table 2. Median and their respective interquartiles for WOMAC and 2MWT

	25th	median	75th
DOR	,00	1,5	3,25
RIGIDITY	,00	,00	,00
FUNC	2	6,00	12,25
TOTAL	3	7,00	16,25
DURATION	1,58	2,00	2,2
DISTANCE	63,22	74,85	84,37
SPEED	0,71	0,80	0,97
CADENCE	90,97	97,30	105,05

Source: Authors

CONCLUSION

The data suggest that there was no statistical difference between the type of knee arthroplasty prosthesis and the medians and their interquartiles of the 2MWT and WOMAC in the evaluated subjects. We suggest new studies that evaluate subjects in the preoperative phase, as walking conditions and functional limitations, age, postoperative time, and other comorbidities may be factors contributing to the data found in the postoperative phase.

LIMITATION

The limitation of data collection in the preoperative period due to the COVID-19 pandemic and the conduct of the study in a single center may influence the study's outcome.

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