Journal of Population Therapeutics & Clinical Pharmacology

REVIEW ARTICLE
DOI: 10.53555/jptcp.v31i1.4307

THE PREVALENCE OF ANTERIOR KNEE PAIN (AKP) IN INDIVIDUALS WHO HAD UNDERGONE TOTAL KNEE ARTHROPLASTY (TKA)

Saeedullah[1*], Faridullah Khan Zimri[2], Tanveer Sadiq[3], S Shujaat Ali Shah[4]

[1*]Consultant Orthopedic Surgeon, Zimri Orthopedic Hospital Islamabad Pakistan.
email: drsaeedullahmerzi@gmail.com
[2]Consultant Orthopedic Surgeon, Zimri Orthopedic Hospital Islamabad Pakistan.
email: drfaridz@gmail.com
[3]Consultant Orthopedic Surgeon, Zimri Orthopedic Hospital Islamabad Pakistan.
email: Tsadique57@hotmqil.com
[4]Consultant Orthopedic Surgeon, Zimri Orthopedic Hospital Islamabad Pakistan.
email: drshujaat910@gmail.com

[*]**Corresponding Author:** Saeedullah
[*]Consultant Orthopedic Surgeon, Zimri Orthopedic Hospital Islamabad Pakistan.
email: drsaeedullahmerzi@gmail.com

ABSTRACT

Background: Total knee arthroplasty, a commonly used surgical technique to treat knee joint problems, especially osteoarthritis. After knee arthroplasty, anterior knee pain (AKP) is a typical problem that patients experience. This mild to moderate pain continues to be a problem even in situations where patellar resurfacing is not done.

Objective: To determine the prevalence of anterior knee pain in individuals who had undergone total knee arthroplasty.

Study design: A cross-sectional study.

Place and Duration: This study was done at, Zimri Orthopedic Hospital Islamabad Pakistan for the period of one year.

Methodology: The study's sample size of 190 patients was established using the WHO formula for sample size calculation, which was based on an estimated 7% prevalence of anterior knee pain following total knee arthroplasty. Each patient's complete medical history was completely documented. Every person underwent a thorough physical examination as well as the customary preoperative baseline investigations. After surgery, patients remained in the ward under strict observation for five days before being discharged, when it was seen as acceptable.

Results: A total of 190 people were involved in this research. The average age calculated was 48.62 years. The mean BMI was 24.6 kg/m2. The mean pain on VAS at the third follow-up was 1.31. There were a total of 133 male, representing 70% of the total sample, and 57 women, representing 30% of the total sample. At the 3rd follow-up, anterior knee pain was absent in 173 (91.05%) patients while it was present in 17 (8.95%).

Conclusion: Anterior knee pain is a common and clinically significant side effect of total knee arthroplasty or total knee replacement (TKR)

Keywords: total knee arthroplasty, total knee replacement, anterior knee pain

INTRODUCTION

Total knee arthroplasty, a commonly used surgical technique to treat knee joint problems, especially osteoarthritis. After total knee arthroplasty, anterior knee pain is a typical problem that patients experience [1, 2]. This mild to moderate pain continues to be a problem even in situations where patellar resurfacing is not done [3]. The literature highlights the incidence and significance of AKP by showing a varying satisfaction rate of 75-89% among TKA patients [4]. Controlling and reducing anterior knee pain is essential for improving the total knee arthroplasty patient's postoperative experience and achieving the best possible results [5]. This study's main objective was to evaluate the prevalence of anterior knee pain in individuals who had undergone total knee arthroplasty.

METHODOLOGY

The study's sample size of 190 patients was established using the WHO formula for sample size calculation, which was based on an estimated 7% prevalence of anterior knee pain following total knee arthroplasty. The consecutive non-probability sampling strategy was used, and the inclusion criteria covered both male and female patients as well as all patients scheduled for TKA, irrespective of the indication.

Exclusion Criteria: The study did not include the participants with a body mass index (BMI) more than 30 kg/m2 and those with impaired immune systems. The latter group comprises people who have been diagnosed with HIV/AIDS, those with a history of cancer, and people with diabetes. Furthermore, the research excluded patients who were suffering from incapacitating illnesses such chronic hepatic, renal, or cardiac failure.

The ethics and scientific committee of the hospital gave its clearance before the study could be carried out. Patients from the emergency room (ER) and outpatient department (OPD) who fulfilled the inclusion requirements were added to the study. Every patient who was enrolled in the trial was given a thorough description of its goals, possible dangers, and expected advantages. The research was clearly stated to be only for data publication and investigative objectives. Every subject gave written informed consent, guaranteeing their voluntary involvement in the research.

Each patient's complete medical history was completely documented. Every person underwent a thorough physical examination as well as the customary preoperative baseline investigations. After surgery, patients remained in the ward under strict observation for five days before being discharged when it was seen as acceptable. Following that, appointments for routine check-ups were made, with a final evaluation taking place at the end of the third postoperative month. Using the visual analogue scale (VAS), the assessments assessed the degree of pain and identified whether anterior knee pain was present or absent.

SPSS version 20 was used to input and analyze the data. Using the visual analogue scale (VAS), mean ± standard deviation (SD) values were computed for quantitative variables such age, BMI, and pain. Frequencies and percentages were used to analyze categorical factors, such as gender, the presence of anterior knee pain at the third-month follow-up, diabetes mellitus, hypertension, and indications for total knee arthroplasty, such as osteoarthritis and rheumatoid arthritis. To study potential effect modifiers, Anterior Knee Pain was stratified based on age, gender, TKA indications, diabetes mellitus, and hypertension, applying the chi-square test with a significance level set at $P < 0.05$. For clarity, the results have been given in tabular form.

RESULTS

A total of 190 people involved in this research. The average age calculated was 48.62 years. The mean BMI was 24.6 kg/m2. The mean pain on VAS at the third follow-up was 1.31. There were a total of 133 male, representing 70% of the total sample, and 57 women, representing 30% of the total sample. At the 3rd follow-up, anterior knee pain was absent in 173 (91.05%) of patients while it was present in 17 (8.95%) of patients. Table number 1 shows the stratification of AKP with respect to gender and indications for TKA.

Table No. 1: stratification of AKP with respect to gender and indications for TKA.

AKP	Stratification of AKP with respect to Gender			
	Male	**%**	**Female**	**%**
Yes	8	4.2	9	4.75
No	121	63.6	52	27.45
TKP	**Stratification of AKP with respect to indications for TKA**			
	Rheumatoid Arthritis	**%**	**Osteoarthritis**	**%**
Yes	5	2.6	12	6.35
No	30	15.85	143	75.2

Table number 2 shows the stratification of AKP with respect to BMI.

Table No. 2: stratification of AKP with respect to BMI.

AKP	Stratification of AKP with respect to BMI					
	19-22.9	**%**	**23-26.9**	**%**	**27-29.9**	**%**
Yes	3	1.5	8	4.2	6	3.25
No	65	34.2	56	29.4	52	27.45

Table number 3 shows the stratification of AKP with respect to diabetes mellitus.

Table No. 3: stratification of AKP with respect to diabetes mellitus

TKP	Stratification of AKP with respect to Diabetes Mellitus			
	Yes	**%**	**No**	**%**
Yes	3	1.5	14	7.45
No	38	20	153	70.05

DISCUSSION

Currently, estimates place the prevalence of clinically significant osteoarthritis in the knee at 5% to 10% of the population [6]. There is little doubt that more people are seeking treatment for severe pain and disability caused by knee arthritis as a result of rising life expectancy and an increasingly active population [7, 8, 9]. The occasional use of viscosupplementation or intra-articular corticosteroids may be taken into consideration if non-operative methods are unable to provide adequate relief [10]. In the end, total knee arthroplasty surgery is required when all nonoperative options have been tried and failed to improve the patient's quality of life [11]. Those who have tried unsuccessful nonoperative methods to improve their condition are given this alternative [12]. In certain instances, patients presenting with severe knee discomfort and displaying obvious bone loss and deformity on first routine radiographs should be referred right away to orthopedic surgeons [13].

The primary finding of this study is the identification of a variety of variables correlated with the prevalence of Anterior Knee Pain, with some characteristics demonstrating a strong association with the condition [14]. The presence of preoperative AKP, age, gender, BMI, diabetes mellitus, hypertension, and other patient characteristics did not show up as predictive markers for the incidence of AKP [15].

Additionally, it was shown that the incidence of postoperative Anterior Knee Pain was associated with the quadriceps muscle strength, the ability to get up from a chair, the thickness of the tibial inlay, and a radiologically determined patellar bone (PB) [16]. AKP is independently correlated with inlay thickness, quadriceps muscle strength, and the CD1 factor, regardless of gender, age, BMI, knee surgery history, or the number of months following surgery, according to a logistic regression analysis [17]. Numerous research works have highlighted the importance of quadriceps muscle activity in predicting functional abilities in patients after complete knee arthroplasties, especially in the older population [18, 19].

Anterior Knee Pain has been linked to decreased quadriceps muscle strength, which emphasizes the significance of strength training combined with adequate physical therapy [20]. Significant correlations were found between AKP and the thickness of the tibial inlay, as demonstrated by sample comparisons and logistic regression analysis. It was observed that those with a thinner inlay had a higher risk of developing postoperative AKP as an independent variable.

Furthermore, it is still unclear whether the quadriceps muscle weakness that participants with anterior knee pain experienced before surgery contributed to their postsurgical AKP or if postsurgical AKP decreased leg loading, which in turn had an impact on quadriceps muscle strength. Future research endeavors may want to investigate the strength of the quadriceps muscle in the unaffected limb, considering the inclination of patients to shift their weight away from the limb that was operated on. This methodology would enable a more thorough examination of the possible causal association between postsurgical AKP and the capacity to rise from a chair, hence promoting a cautious interpretation of the results acquired.

CONCLUSION

Men and women alike frequently express stress about pain after surgery. It is noteworthy that anterior knee pain is a common and clinically significant side effect of total knee arthroplasty or total knee replacement.

Funding source

This study was conducted without receiving financial support from any external source.

Conflict in the interest

The authors had no conflict related to their interest in the execution of this study.

Permission

Prior to initiating this study, approval from the ethical committee was obtained to ensure adherence to ethical standards and guidelines.

REFERENCES

1. Khan S, Hanif M, Ishaq M. Frequency of Anterior Knee Pain (AKP) in Different Gender Groups after Total Knee Replacement (TKR). Pakistan Journal of Medical & Health Sciences. 2023 Mar 5;17(01):512-.
2. Ullah G, Khan J, Usmanullah MI, Hanif M, Khan S. Association of Anterior Knee Pain (AKP) in Different Age Groups after Total Knee Replacement (TKR). Pakistan Journal of Medical & Health Sciences. 2023 Feb 26;17(01):369-.
3. Azhar M, Jamal N, Akhtar MW, Alam MM. Original Articles ANTERIOR KNEE PAIN SIX MONTHS AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: Memoona Azhar1, Nauman Jamal2, Muhammad Waseem Akhtar3, Muhammad Mahmood Alam4. Journal of Akhtar Saeed Medical & Dental College. 2020 Jul 1;2(3):156-60.
4. Vaishya R, Majeed A. Pain management in total knee replacement. Apollo Medicine. 2012 Dec 1;9(4):323-35.
5. Chodór P, Kruczyński J. Preoperative risk factors of persistent pain following total knee arthroplasty. BioMed Research International. 2022 Dec 15;2022.
6. Chobing H, Yadav A, Panchal S, Pawar E, Gupta D, Shah N. A functional outcome and residual knee pain following total knee arthroplasty: A retrospective study. Hypertension.;47:60-2.
7. Momoli A, Giaretta S, Modena M, Micheloni GM. The painful knee after total knee arthroplasty: evaluation and management. Acta Bio Medica: Atenei Parmensis. 2017;88(Suppl 2):60.
8. Breugem SJ, Haverkamp D. Anterior knee pain after a total knee arthroplasty: what can cause this pain?. World journal of orthopedics. 2014 Jul 7;5(3):163.

9. De Castro RL, Antonio BP, de Castro GC, Bassora FD. Treatment of residual Pain After Total Knee Arthroplasty. Biomedical Journal of Scientific & Technical Research. 2019 Oct 22;22(3):16637-44.
10. Memtsoudis SG, Sun X, Chiu YL, Stundner O, Liu SS, Banerjee S, et al. Perioperative comparative effectiveness of anesthetic technique in orthopedic patients. Anesthesiol. 2013;118(5):1046-58.
11. Barone JE Neuraxial anesthesia decreases joint surgery complications. [Online]. Published on May 10, 2013. Available at https://www.medscape.com/viewarticle/804002
12. Andersen LO, Husted H, Otte KS, Kristensen BB, Kehlet H. A compression bandage improves local infiltration analgesia in total knee arthroplasty. Acta Orthop. 2008;79(6):806-11.
13. Shum CF, Lo NN, Yeo SJ, Yang KY, Chong HC, Yeo SN. Continuous femoral nerve block in total knee arthroplasty: immediate and twoyear outcomes. J Arthroplasty. 2009;24(2):204-9.
14. Ilfeld BM, Mariano ER, Girard PJ, Loland VJ, Meyer RS, Donovan JF, et al. A multicenter, randomized, triple-masked, placebo- controlled trial of the effect of ambulatory continuous femoral nerve blocks on discharge-readiness following total knee arthroplasty in patients on general orthopaedic wards. Pain. 2010;150(3):477-84.
15. Essving P, Axelsson K, Kjellberg J, Wallgren O, Gupta A, Lundin A. Decreased morphine consumption and pain intensity with local infiltration analgesia(LIA) following total knee arthroplasty. Acta Orthop. 2010;81(3):354-60.
16. Harrison L. Bupivacaine effective for knee replacement pain. [Online]. Published on March 14, 2014. Available at https://www.medscape.com/viewarticle/821998
17. Barrington JW, Olugbode O, Lovald S, Ong K, Watson H, Emerson RH Jr. Liposomal Bupivacaine: A Comparative Study of More Than 1000 Total Joint Arthroplasty Cases. Orthop Clin North Am. 2015;46(4):469-77.
18. Connelly JO, Edwards PK, Mears SC, Barnes CL. Technique for Periarticular Local Infiltrative Anesthesia Delivery Using Liposomal Bupivacaine in Total Knee Arthroplasty. J Surg Orthop Adv. 2015;24(4):263-6.
19. Dixit V, Fathima S, Walsh SM, Seviciu A, Schwendt I, Spittler KH, etal. Effectiveness of continuous versus single injection femoral nerve block for total knee arthroplasty: A double blinded, randomized trial. Knee. 2018;25(4):623-30.
20. Labraca NS, Castro-Sánchez AM, Matarán-Peñarrocha GA, ArroyoMorales M, Sánchez-Joya Mdel M, Moreno-Lorenzo C. Benefits of starting rehabilitation within 24 hours of primary total knee arthroplasty: randomized clinical trial. Clin Rehab. 2011;25(6):557-66