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Original Research Article

Evaluation of Prosthetic Joint Infection Risk after total Knee Arthroplasty

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Abstract

Background: Total knee arthroplasty for end-stage knee arthritis is a common surgery nowadays which results in significant improvements in terms of quality of life, pain and function. Among majority of cases the outcomes after total knee arthroplasty are excellent.

Material & Methods: The present study was conducted in department of orthopedics at our tertiary care hospital. The study was conducted in duration of one year, after seeking approval from the Institutional Ethics Committee. All protocols of ethical conduct including written and informed consents of the patients enrolled for the study was strictly complied. Study procedure was explained to all the individuals who consented and undergone for study.

Results: In the present study Infection was reported in 03 patients. It was found that culture was done in all 03 patients and it was reported that Staphylococcus and E. coli were the most common organism identified. On the drug sensitivity testing it was found that, Staphylococcus was sensitive to Flucloxacillin and E. coli were found sensitive to Chloramphenicol. Out of the 03 patients one patient had deep infection and had two-stage revision of primary TKA surgery. and all three were kept on oral and intravenous antibiotics. The knee score was reported to be normal at the end of their treatment.

Conclusion: We found that infections after primary total knee arthroplasty were less frequent but devastating and generally result in poor outcome. We recommend from the present study that all the cases of infections after primary total knee arthroplasty should promptly treated with radical debridement.

Keywords: total Knee arthroplasty, periprosthetic infection, antibiotics, fracture.

Introduction

The most common and challenging complication reported after total knee arthroplasty is periprosthetic infection (PPI). It was reported among 1-2 % cases of primary Total knee arthroplasty and magnitude is seen higher 3-5 % among cases of revision Total knee arthroplasty [1]. Total knee arthroplasty for end-stage knee arthritis is a common surgery nowadays which results in significant improvements in terms of quality of life, pain and function. Among majority of

cases the outcomes after total knee arthroplasty are excellent [2]. It was stated in previous researches that certain reported cases of aseptic total knee arthroplasty failures were actually not be truly aseptic but they were sequalae to undiagnosed periprosthetic infections years [3].

Two-stage exchange arthroplasty with 4-6 weeks of antibiotic treatment and antibiotic cement results in most successful outcomes for infection eradication. Sometimes interval antibiotic cement spacer is also applied [4]. Infection following Total knee arthroplasty sometimes difficult to diagnose and treat. Diagnosis of infections after total knee arthroplasty is multifactorial and depends on the clinical spectrum, radiographs, bone scans, synovial fluid examination, serologic tests and intra-operative culture with histology [5]. Newer diagnostic modalities including ultrasound and molecular studies are playing a helpful role [6].

There is need of improvement in clinicians ability to diagnose infections after total knee arthroplasty with more sensitive algorithms and diagnostic tests which could reveal more PPI than currently reported [7]. Management of infections after total knee arthroplasty is a topic of research from a long period of time, as the infections rates varies from 05% to 5.6%. Long-term follow-up studies had been reported that periprosthetic infection seen among 1.5% patients in the initial two years after Total knee arthroplasty and 0.5% incidence among cases per year after two years [8]. Hence, present study was conducted to Evaluate the Prosthetic Joint Infection Risk after total knee arthroplasty at our tertiary care hospital.

Materials & Methods:

The present single Centre observational study was conducted at our tertiary care hospital. The study was conducted in Department of orthopedics. The study duration was of one year from January 2018 to December 2019. A sample size of 50 was calculated at 95% confidence interval at 5% acceptable margin of error by epi info software version 7.3. Institutional Ethics Committee Clearance was obtained before start of study and written and informed consent for the procedure was obtained from all the patients. Strict confidentiality was maintained with patient identity and data and not revealed, at any point of time. We used to predesign the questionnaire Performa, study procedure was explained to all the individuals who consented and undergone total knee arthroplasty in study duration.

Patients who were not responded were excluded from the study. The questionnaire included questions on history or suspicion of infection in the joint or wound after total knee arthroplasty, history of hospitalization due to it and any debridement or re-surgery for their infection, history of antibiotics and etc. Data were entered in the MS office 2010 spread sheet and Epi Info v7. Data analysis was carried out using SPSS v22. Qualitative data was expressed as percentage (%) and Pearson's chi square test was used to find out statistical differences between the study groups and sensitivity, specificity, positive predictive value and negative predictive value were calculated. If the expected cell count was < 5 in more than 20% of the cells then Fisher's exact test was used. All tests were done at alpha (level significance) of 5%; means a significant association present if p value was less than 0.05 and highly significant if p value less than 0.01.

Results:

In the present study, we enrolled 50 patients who were given consent and undergone for total knee arthroplasty at our tertiary care hospital during the study duration. Among the total study participants, 01 (2%) patients were in the age group of 21-40 years, 16 (32%) cases were in the age group of 41-60 years and

33 (66%) patients were in the age group of 61-80 years. The mean age of study participants was 65.7 ± 4.6 years. Out of the total study participants, 26 (52%) patients were male and 24 (48%) patients were female. The mean value of BMI of study participants was 26.52 ± 1.34. However, this distribution was statistically non-significant (P value >0.05). (Table 1)

Table 1: Age and gender wise distribution of the study participants.

Parameters			**p value**
Age (Years)	21-40	01 (2%)	>0.05
	41-60	16 (32%)	
	61- 80	33 (66%)	
Mean age (Years)		65.7 ± 4.6	
Gender	Female	24 (48%)	>0.05
	Male	26 (52%)	
BMI (Mean)		26.52 ± 1.34	

In the present study Infection was reported in 03 patients. It was found that culture was done in all 03 patients and it was reported that *Staphylococcus* and *E. coli* were the most common organism identified. On the drug sensitivity testing it was found that, *Staphylococcus* was sensitive to Flucloxacillin and *E. coli* were found sensitive to Chloramphenicol. Out of the 03 patients one patient had deep infection and had two-stage revision of primary TKA surgery. and all three were kept on oral and intravenous antibiotics. The knee score was reported to be normal at the end of their treatment. (Table 2)

Table 2: Distribution of study participants according to block

Characteristics features	**No. of cases**
Total no. of infected patients	03
Culture was done	03
Organism reported	*Staphylococcus* and *E. coli*
Patient with deep infection	01
Got treated with antibiotics	03

Discussion:

In the present study, we enrolled 50 patients who were given consent and undergone for total knee arthroplasty at our tertiary care hospital during the study duration. Among the total study participants, 01 (2%) patients were in the age group of 21-40 years, 16 (32%) cases were in the age group of 41-60 years and 33 (66%) patients were in the age group of 61-80 years. The mean age of study participants was 65.7 ± 4.6 years. Out of the total study participants, 26 (52%) patients were male and 24 (48%) patients were female. The mean value of BMI of study participants was 26.52 ± 1.34. However, this distribution was statistically non-significant (P value >0.05). The chronic infection has wide scenario of presentation, with symptoms and signs resembles to those which were reported in the acute and subacute infections. Hence, only from the assessment of the detailed clinical history, it can be confirmed that whether the patient had acute, subacute or chronic infections, which is very important for diagnosis and management of the condition [9].

In the present study Infection was reported in 03 patients. It was found that culture was done in all 03 patients and it was reported that *Staphylococcus* and *E. coli*

were the most common organism identified. On the drug sensitivity testing it was found that, *Staphylococcus* was sensitive to Flucloxacillin and *E. coli* were found sensitive to Chloramphenicol. Out of the 03 patients one patient had deep infection and had two-stage revision of primary TKA surgery. and all three were kept on oral and intravenous antibiotics. The knee score was reported to be normal at the end of their treatment. A similar study was conducted by Rudani S et al and found nearly similar results to the present study and concluded that infection after primary total knee arthroplasty was rare but conditions is devastating and further led to a poor outcome. It was reported that the *Staphylococcus* and *E. coli* were the most common organism identified. The knee score was reported to be normal at the end of their treatment of surgery and oral and intravenous antibiotics [10]

Many previous studies have been reported that preventive measures when taken during primary total knee arthroplasty result in reduction of the risk of contamination. The outcome of patients who were presented with deep infection after primary total knee arthroplasty were reported to be poor [11]. A study conducted by Koskinen E et al reported similar results in a much larger cohort of patients from Sweden, they found that with only 20% patients recovering from infection after TKA with a good functioning prosthesis [12].

Conclusion

We concluded from the present study that the follow-up period of present study of 1 years is shorter duration and more elaborative research should be conducted to generalize the result to the population. We found that infections after primary total knee arthroplasty were less frequent but devastating and generally result in poor outcome. We recommend from the present study that all the cases of infections after primary total knee arthroplasty should promptly treated with radical debridement. After that only complete revision of primary total knee arthroplasty should be done.

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