ASSESSMENTS OF INFECTION PROFILE AFTER TOTAL KNEE REPLACEMENT

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ABSTRACT

Background: Infection following TKAs 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. Newer diagnostic modalities including ultrasound and molecular studies are playing a helpful role. **Material & Methods:** The present study was conducted in department of orthopedics at our tertiary care hospital. The study was conducted in duration of three years, 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 TKA in study duration. **Results:** Infection was reported in 15 patients in the present study. It was found that culture was done in all 15 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 15 patients four patients had treated with single stage joint debridement with prosthesis retention and three patients had two-stage revision of primary TKA surgery in which first stage was debridement with use of antibiotic spacer and second stage was reimplantation with prosthesis. Two patients refused for the surgery and six were kept on antibiotic for long period. Rest of all the patients were started 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.

Key words: total Knee arthroplasty, knee replacement, periprosthetic infection.

INTRODUCTION

Total knee arthroplasty (TKA) 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. The most common and challenging complication reported after total knee arthroplasty is periprosthetic infection (PPI). It was reported among 1-2 % cases of primary TKAs and magnitude is seen higher 3-5 % among cases of revision TKAs **(1)**. 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. 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 (2).

Infection following TKAs 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. Newer diagnostic modalities including ultrasound and molecular studies are playing a helpful role (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). The evidences are limited about irrigation and debridement, chronic antibiotic suppression, direct one-stage exchange, arthrodesis and salvage procedures like amputation (5).

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 TKA and 0.5% incidence among cases per year after two years (6). Total knee arthroplasty is performed worldwide, with a reported evidence of more than 6 lac surgical procedures per year only in the USA and with the mean survival rate of 95% which was studied over 15 years (7). Hence taking consideration of all factors we designed present study to assess the magnitude of infections after total knee arthroplasty during a follow up period of three years.

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 was conducted in duration of three years, 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. We used predesigned the questionnaire Performa, study procedure was explained to all the individuals who consented and undergone TKA in study duration. Those who were not present in the city, had been contacted telephonically and by emails as per their convenience. 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 TKA, history of hospitalization due to it and any debridement or re-surgery for their infection, history of antibiotics and etc. The results thus obtained shall be subjected to statistical analysis. The data were analyzed by using software's MS Excel 2010, Epi Info v7 and SPSS v22.

RESULTS

During the period of the present study 236 primary TKAs were performed on 200 patients. We were able to contact only 165 patients by telephonically and by emails. Out of the remaining 35 patients, 15 had died and 20 were lost to follow-up or had changed the hospital for one or the other reason. Follow-up assessments were completed for 165 patients out of the 200 patients with a mean follow-up duration of 1.8 years (1 to 3 years). (Table 1)

Table 1: Distribution of study participants according to study parameters

Demographic parameters	No. of patient
Total Knee replacement performed	236
Total patient included	200
Total patient contacted	165
No. of patient died in follow up	15
Lost in follow up period	20

Infection was reported in 15 patients in the present study. It was found that culture was done in all 15 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 15 patients four patients had treated with single stage joint debridement with prosthesis retention and three patients had two-stage revision of primary TKA surgery in which first stage was debridement with use of antibiotic spacer and second stage was

reimplantation with prosthesis. Two patients refused for the surgery and six were kept on antibiotic for long period. Rest of all the patients were started 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	15
Culture was done	15
Patient with single stage joint debridement	4
Patient with two stage revision	3
Refused to undergo surgery	2
Got treated with antibiotics	6

DISCUSSION

Infections after total knee arthroplasty can be divided into three types: acute, subacute and chronic. The time period reported to vary for all the above types of infection. The time period depends upon the start of the infectious condition and the extent of it and hence it is necessary to plan the treatment protocol accordingly **(8)**. The acute and subacute types or phases of infections are related to the surgical intervention and commonly the causative etiology behind is bacterial infection, related to skin. Acute infections are identified by signs and symptoms of pain, heat, edema, erythema along with fever. The most common pathogens associated are virulent germs such as S. aureus and Gram-negative bacilli. Patients with subacute infections usually presented with signs and symptoms that are non-characteristic and sometimes present as persistent pain, which makes aseptic suspicion in differential diagnosis and implant loosening **(9)**.

During the period of the present study 236 primary TKAs were performed on 200 patients. We were able to contact only 165 patients by telephonically and by emails. Out of the remaining 35 patients, 15 had died and 20 were lost to follow-up or had changed the hospital for one or the other reason. Follow-up

assessments were completed for 165 patients out of the 200 patients with a mean follow-up duration of 1.8 years (1 to 3 years).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 **(10)**.

Infection was reported in 15 patients in the present study. It was found that culture was done in all 15 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 15 patients four patients had treated with single stage joint debridement with prosthesis retention and three patients had two-stage revision of primary TKA surgery in which first stage was debridement with use of antibiotic spacer and second stage was reimplantation with prosthesis. Two patients refused for the surgery and six were kept on antibiotic for long period. Rest of all the patients were started 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 **(11)**

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 **(12)**. 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

(13). A study conducted by Blom A et al reported similar results to present study that outcome of PPI after primary TKA is poor and intervention like two-stage revision of primary TKA and the total debridement were improved the outcome **(14)**.

CONCLUSION

We concluded from the present study that the follow-up period of present study of 3 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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