



Original Article



The Rate of Postoperative Infections in Patients with Total Hip Replacement Done In Ayub Teaching Hospital, Abbottabad

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ABSTRACT

After total hip replacement many complications occur postoperatively. One of the serious complications is the surgical wound site infection that can convert into peri-prosthetic joint infection. **Objective:** To determine the rate of postoperative infection in patients with total hip replacement done in Ayub Teaching Hospital, Abbottabad. **Methods:** This retrospective cross-sectional study investigated 32 patients underwent total hip replacement in the Orthopedic Department of Ayub Teaching Hospital, Abbottabad from January 2020 to April 2024. All the adult patients underwent unilateral total hip replacement were enrolled. Patient's demographic details, indication for surgery, co-morbidities, hip deformity, and post-operative complications were recorded. SPSS version 26.0 was used for data analysis. **Results:** The overall mean age and length of hospital stay was 54 ± 15.9 years and 14 ± 12.8 days. The incidence of post-operative infection was 34.4% (n=11). Wound infection was the most prevalent post-operative infection/complications found in 6 (18.8%) followed by urinary tract infection 3 (9.4%), dislocation 1(3.1%), and pneumonia 1(3.1%). According to univariate analysis, American system of anesthesiologist (ASA) grades, hip deformity, and blood transfusion were significantly associated with post-operative infection. **Conclusions:** It was concluded that several pre-operative risk factors considerably affect the probability of post-operative wound infection following total hip arthroplasty; hence, early diagnosis, management, and treatment are necessary to decrease morbidity and death.

INTRODUCTION

Total Hip Replacement (THR) remains a highly effective method for relieving symptoms and restoring function in a variety of conditions, including osteoarthritis, inflammatory arthritis, infection etc [1]. Among these, Osteoarthritis (OA) emerges as an important determinant of THR (cemented or cementless). Prevention of hip pain in OA includes various preventive measures such as analgesics, exercise, education, and weight management, with surgical intervention in THR appears to be the most effective strategy for the advanced stage of the disease [2]. The annual rate of Total Hip Arthroplasty (THA) performed in the United States continues to rise,

paralleling the rise in infectious complications [3]. However, despite the proven efficacy of THR, complications can arise, potentially leading to suboptimal functional outcomes in suffering patients [4]. Surgical site Infections (SSI) that occur after surgery after Total Hip Arthroplasty (THA) were generally classified into three main types: a. Complication after surgery (early onset), occurring within three months of surgery. b. Delayed deep infection, occurring three to twelve months after surgery. c. Late hematogenous infections, seen more than one year after surgery [5]. A meta-analysis found that the incidence of deep infections after Total Hip Arthroplasty (THA) ranged



from 1.2% to 2.3%, which is consistent with the lower rates observed with antibiotic-impregnated cements [6, 7]. Contrary to their use, another study showed that implementation of closed- suction surgical wound drainage did not reduce the risk of Surgical Site Infection (SSI) after THA [8]. Major complications frequently encountered after Total Hip Replacement (THR) include mortality, reoperation, infection, pulmonary embolism, and abscess [9]. The incidence of these complications shows variability in records and health care. Several factors were associated with increased morbidity after THR. Preoperative identification of predictive risk factors for postoperative complications, particularly high-risk patients, is an important advance in strategies aimed at minimizing complications [10]. In developed countries, efforts were directed to evaluate changes in raw materials and metallurgy to achieve increased outcomes, reduced complications, and expanded coverage in longevity. In contrast, developing countries tend to focus on preventing complications.

The present study aimed to determine the rate of postoperative infection in patients with total hip replacement done in Ayub Teaching Hospital, Abbottabad.

METHODS

In this retrospective cross-sectional study 32 patients underwent total hip replacement in the Orthopedic Department of Ayub Teaching Hospital, Abbottabad from January 2020 to April 2024 after approval from institutional review board with reference number RC-EA-2024/092. All the adult patients who underwent unilateral total hip replacement were enrolled. Patients who underwent reconstruction, double grafts, initially treated, and individuals with incomplete data were excluded. Sample size was calculated based on following parameters; power of 80%, and precision of 8%, 95% confidence interval, incidence rate of SSI 5.6% [11]. Patient's demographic details, indication for surgery, comorbidities, hip deformity, and post-operative complications were recorded. In accordance with hospital protocol, all patients underwent preoperative cardiac and anesthesia testing, including measurement of blood glucose levels. This study identified the requirement for postoperative intensive care unit hospitalization based on the projected risk complications. Prophylactic antibiotics of first generation cephalosporins, i.e., cefazolin were used in all cases at the induction of anesthesia and were continued for 72 hours [11]. The diagnosis of infection was obtained from clinical and microbiology reports. Among 11 cases of wound infection, 7 cases had age 46-55 years and 4 cases had age 30-45 years. Leg length discrepancy, unexpected pain and swelling were the most common causes of hospital stay. SPSS version 26.0 was used for data analysis. Continuous variables were assessed as mean \pm standard deviation. All risk factors that showed a significant effect on morbidity at the 5% level of

significance in univariate analysis were retested using multivariate logistic regression factors associated with complications were presented as Adjusted Odds Ratio (AOR) with 95% Confidence Interval (CI). The significance level for multivariate analysis was set at $p < 0.05$.

RESULTS

The overall mean age and length of hospital stay was 54 ± 15.9 years and 14 ± 12.8 days (Table 1).

Table 1: Baseline Characteristics of study participants (n=32)

Variables	Values Mean \pm SD/N (%)
Age (Years)	54 ± 15.9
Duration of Hospital Stay (Days)	14 ± 12.8
Length of Surgery (Minutes)	228 ± 76
Hip Deformity	14 (43.8%)
Blood Transfusion	24 (75%)
Estimated Blood Loss	678 ± 398

Patient's distribution based on their Body Mass Index (BMI) illustrated in figure 1.

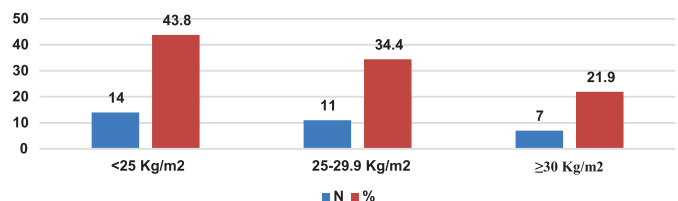


Figure 1: Patient's Distribution Based on their Body Mass Index (n=32)

The incidence of post-operative infection was 34.4% (n=11). Wound infection was the most prevalent post-operative infection/complications found in 6 (18.8%) followed by urinary tract infection 3 (9.4%), dislocation 1 (3.1%), and pneumonia 1 (3.1%). Majority of the cases had ASA I and II (Table 2).

Table 2: Incidence of Infection and ASA

Variables	Value N (%)
Type of Infections	
Wound Infection	6 (18.8%)
Urinary Tract Infection	3 (9.4%)
Dislocation	1 (3.1%)
Pneumonia	1 (3.1%)
ASA	-
I-II	20 (62.5%)
III-IV	12 (37.5%)

According to univariate analysis, ASA grades, hip deformity and blood transfusion were significantly associated with post-operative infection (Table 3).

Table 3: Univariate and Multivariate Analysis

Variables	OR	95% CI and AOR	p-Value
Blood Transfusion	3.5	2.9 (1.2-6.9)	0.021
ASA	-	-	0.049
I-II	1	-	-

III-IV	0.46	2.9(0.12-1.00)	-
Hip Deformity	2.2	3.1(1.3-7.2)	0.005

DISCUSSION

The current study primarily focused on the rate of postoperative infection in patients who had total hip replacement performed at Ayub Teaching Hospital in Abbottabad. The researchers discovered that the incidence of post-operative infection was significantly influenced by pre-operative hip deformity, blood transfusion and ASA grade following total hip replacement. A total of 34.4% of patients were found to have major postoperative infections, with wound infections being the most prevalent variety of infection. Previously, a number of studies that produced data that were equivalent to this finding found that the frequency of infection was between 30 and 40 percent [10-12]. According to the findings, the two most common problems and infections that might occur after Total Hip Replacement (THR) were hip dislocation and wound infection. Studies conducted in industrialized nations have demonstrated that the rate of dislocation was influenced by a variety of variables. These factors include (a) patient-related factors, which include sex, hip dysplasia, smoking, significant disease or episode, body mass index, gender and age. The surgical method, the removal or repair of the capsule, the anatomical location, and any previous hip surgery were all considered to be surgical considerations. (c) Anthropometric data, including the length of the femoral neck, the offset, and the size of the head [11-14]. Patients receiving blood transfusions have been shown to have an increased risk of postoperative infections, short-term mortality, duration of hospital stay, and length of stay in critical care unit, according to the majority of the prior studies that have been conducted on orthopedic patients. Previous research has shown that the findings of the current study were in agreement with those findings [15, 16]. A high incidence of blood transfusions can indicate that the surgical technique was more complicated overall, which can result in longer surgical procedures and a larger amount of blood loss that necessitates blood transfusions. In addition, the blood transfusion itself stops the patient from immobilizing themselves and causing them to remain in bed for an extended period of time. Additionally, it can lead to pressure sores and atelectasis. As a result, minimizing the amount of blood that was lost essential in order to lessen the likelihood of problems and infections [17, 18]. It has been demonstrated that preoperative impairment was positively linked with postoperative morbidity. This includes leg length discrepancies and abductor imbalances, both of which can put patients in a state of discontent and cause them to return to their previous level of mobility. According to the findings of these case series, patients who had preoperative flexion contracture rates had a greater risk of developing complications such as abscess and wound

infection [19, 20]. Post-operative infection was shown to be substantially linked with ASA grades, hip deformity and blood transfusion according to the findings of this research. It was found that the findings were consistent with those of previous investigations [20]. The purpose of this study was to describe the experience of Total Hip Replacement (THR) from hospital care in a poor nation, exhibiting greater complication rates in comparison to industrialized countries. One possible explanation for this disparity was that different surgical procedures and after care regimens were being utilized. The level of competence possessed by the surgeon was a significant factor in determining the outcome of surgical procedures. In addition, the insufficient number of participants in this study reflected the statistically significant relationships between the factors related to patients and associated factors to operative room, surgical skills and co-morbid presence.

CONCLUSIONS

It was concluded that several pre-operative risk factors considerably affect the probability of post-operative wound infection following total hip arthroplasty; hence, early diagnosis, management, and treatment are necessary to decrease morbidity and death.

Authors Contribution

Conceptualization: MY

Methodology: SUS, MY

Formal analysis: AUR, AGSK, RK

Writing, review and editing: SUS, MY, AGSK, MSZ, SA

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

All the authors declare no conflict of interest.

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