e-ISSN: 0975-9506, p-ISSN: 2961-6093

Available online on www.ijpqa.com

International Journal of Pharmaceutical Quality Assurance 2026; 17(4); 385-391

Original Research Article

Incidence and Risk Factors for Periprosthetic Joint Infection Following Total Joint Arthroplasty: A Retrospective Observational Study

Mohd Asif Ali[1], Md Faizan Ali[2], Satyaprakash Suman[3], Ramashish Yadav[4]

[1]Senior Resident, Department of Orthopedic, Darbhanga Medical College Hospital, (DMCH) Laheriasarai, Darbhanga, Bihar, India.

[2]Junior Resident (Academic), Department of Orthopedic, Darbhanga Medical College Hospital, (DMCH), Laheriasarai, Darbhanga, Bihar, India.

[3]Junior Resident (Academic), Department of Orthopedic, Darbhanga Medical College Hospital, (DMCH), Laheriasarai, Darbhanga, Bihar, India.

[4]Associate Professor and HOD, Department of Orthopedic, Darbhanga Medical College Hospital, (DMCH), Laheriasarai, Darbhanga, Bihar, India.

Received: 13-02-2026 / Revised: 10-03-2026 / Accepted: 21-04-2026

Corresponding Author: Dr. Mohd Asif Ali

Conflict of interest: Nil

Abstract:

Background: Periprosthetic joint infection (PJI) is one of the most severe complications after total joint arthroplasty (TJA), leading to increased morbidity, longer hospital stays, multiple procedures and higher healthcare costs. The identification of risk factors associated with the patient should be useful for improving both the patient's outcome and postoperative complications.

Aim: To estimate the prevalence of PJI after primary TJA and to identify the demographic, clinical, and perioperative risk factors for the development of PJI.

Methodology: A retrospective observational study done in the Department of Orthopedics at Darbhanga Medical College and Hospital, Laheriasarai, Bihar. The records of 120 patients who had undergone total hip arthroplasty or total knee arthroplasty as their first operation during a 12-month period were reviewed. Demographic data, comorbidities, operative factors, laboratory data and postoperative outcomes were evaluated. Univariate comparison and multivariate logistic regression model analysis were used for statistical analysis to determine independent predictors of PJI.

Results: The PJI rate was 8.3%. Univariate analysis revealed diabetes mellitus, obesity, anemia, hypoalbuminemia, smoking history, rheumatoid arthritis, prolonged operative duration, corticosteroid use and elevated inflammatory markers as significant risk factors for PJI. Multivariate logistic regression analysis revealed diabetes mellitus, obesity, hypoalbuminemia, operative duration > 120 minutes and preoperative corticosteroid use as independent risk factors for PJI.

Conclusion: PJI continues to be a major complication after TJA. Modifiable risk factors, careful patient selection, better nutritional and metabolic status, reducing surgical time and closely following infection prevention and control protocols can significantly lower the risk of PJI and enhance surgical outcomes.

Keywords: Periprosthetic Joint Infection, Total Joint Arthroplasty, Total Knee Arthroplasty, Total Hip Arthroplasty, Risk Factors, Retrospective Observational Study, Orthopedic Surgery.

DOI: 10.25258/ijpqa.17.4.62

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0) and the Budapest Open Access Initiative (http://www.budapestopenaccessinitiative.org/read), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Total joint arthroplasty, particularly total hip arthroplasty (THA) and total knee arthroplasty (TKA), is well known as one of the most effective orthopedic surgeries for alleviating pain, restoring function and enhancing quality of life in patients with advanced degenerative joint disease including arthritis of the hip, arthritis of the knee, avascular necrosis and post-traumatic arthritis. Since the last twenty years, the number of primary joint arthroplasty has grown significantly all over the world, due to the increase in life expectancy, obesity, sedentary lifestyle and the burden of musculoskeletal disorders. With the advancements in implant design, surgical techniques, perioperative care, and rehabilitation protocols, excellent long-term functional outcomes and implant survivorship have been achieved making TJA the treatment of choice when conservative management has failed for end-stage joint disease [1,2].

Although no significant breakthrough has been achieved, periprosthetic joint infection (PJI) is one of the most devastating and challenging complica-

tions after total joint arthroplasty (TJA). While incidence of PJI after primary arthroplasty is relatively low (typically between 1% and 2%), after revision arthroplasty it is higher and the consequences of these infections are significant to patients and health systems [3,4]. PJI is linked to long-term pain, implant loosening, extended hospitalization, multiple surgical procedures, higher health care costs, decreased functional outcomes, decreased quality of life, morbidity, and mortality. In most instances, the necessary management involves long-term antimicrobial therapy, debridement, implant retention, one-stage revision arthroplasty or two-stage revision arthroplasty depending on the chronicity and severity of the infection [5,6].

PJI is a complex disease with numerous pathogenetic factors that include host susceptibility, microbial virulence, surgical risk and implant factors. Microorganisms like Staphylococcus aureus, coagulase-negative staphylococci and other biofilm-producing bacteria are able to attach to implant surfaces and form extracellular matrices that shield them from host immune responses and antimicrobial agents. The ability to eradicate infection is very difficult, and sometimes requires removal of the implant, when the biofilm formation has significantly reduced the efficacy of antibiotic treatment [7,8]. Therefore, the importance of risk factor identification and modification has increased to a pivotal issue in orthopedic practice as a means of preventing PJI.

There are many studies that have explored patient-related, surgical-related and postoperative risk factors for the development of PJI. Advanced age, male gender, obesity, diabetes mellitus, hypertension, chronic kidney disease, rheumatoid arthritis, anemia, malnutrition, smoking, alcohol use, immunosuppressive therapy, and previous corticosteroid use, are patient-related risk factors [9-11]. Other surgical factors that have been shown to increase the risk of infection include prolonged operative time, blood loss, blood transfusion, bilateral surgeries, poor preparation of the skin, early wound complications, and prolonged drainage of the wound [12]. The strength of association between these variables, however, differs within various populations and a few studies have produced inconsistent results, and so there is a need for the risk factors to be evaluated at individual institution level.

The incidence and risk factors for PJI can vary between healthcare settings due to differences in patient characteristics, comorbidities, microorganisms, peri-operative infection control, antibiotic prophylaxis, surgical skill and post-operative follow-up. The majority of evidence base for PJI has come from multi-center registries or large databases from developed countries, and limited numbers of data are available from tertiary care centers in India. Regional studies are important because the epidemiology of infections and related risk factors can vary, as can the healthcare delivery system between and within regions. Understanding modifiable predictors within the local population can aid in targeted prevention, optimized peri-operative management, better patient selection, and decrease the burden of revision arthroplasty.

Retrospective observational studies using hospital medical records offer real world evidence of post-operative outcomes and complications. These studies would allow estimation of demographic data, related comorbidities, peri-operative factors, microbiological data, and postoperative clinical outcomes in the routine clinical setting. Retrospective studies are useful for estimating rare complications like PJI, as they depend on the availability of documentation, but they are also useful in situations where prospective studies are not possible, such as in resource-limited areas [13].

The Darbhanga Medical College Hospital (DMCH), Laheriasarai, Bihar is a major tertiary care teaching institution which serves the people of North Bihar and adjoining area of great population. The Department of Orthopedics performs a good number of primary total hip and knee arthroplasties yearly, which is an appropriate time to assess the incidence of post-operative complications, such as periprosthetic joint infection. The incidence and associated risk factors in this regional population could help reinforce the infection prevention measures, better optimize the perioperative patients with multiple comorbidities and inform evidence-based clinical decision-making in other similar tertiary healthcare settings.

As PJI is a major clinical, functional and economic problem and in the absence of any data from the institution in Eastern India, this retrospective observational study was performed in the Department of Orthopedics, Darbhanga Medical College Hospital (DMCH), Laheriasarai, Darbhanga, Bihar, India. The goal of the study is to establish the rate of PJI after primary total joint arthroplasty and to identify demographic, clinical and periprosthetic factors that are associated with the development of PJI. Results will be used to refine risk stratification, early identification of high-risk patients, and adoption of effective preventive measures to improve surgical outcomes after a TJA.

Methodology

Study Design: The aim of this study was to conduct a hospital based retrospective observational study to evaluate the rate and risk factors for periprosthetic joint infection (PJI) after TJA. The study included a retrospective analysis of hospital records of patients who received their primary total hip arthroplasty (THA) or total knee arthroplasty (TKA). The results of clinical, laboratory, operative and follow-up data were used for the evaluation of the occurrence of PJI and its associated risk factors.

Study Area: The study was carried out at the Department of Orthopedics, Darbhanga Medical College and Hospital (DMCH), Laheriasarai, Darbhanga, Bihar, India.

Study Duration: This study was conducted over 1 year from December 2024 to November 2025.

Sample Size: After applying the inclusion/exclusion criteria, a total of 120 patients who underwent primary, total hip arthroplasty or total knee arthroplasty during the study period were included in the study.

Sample Population: The study population consisted of adult patients who underwent primary total hip arthroplasty (THA) or primary total knee arthroplasty (TKA) for various indications such as primary osteoarthritis, rheumatoid arthritis, avascular necrosis, post-traumatic arthritis, inflammatory arthritis, or other degenerative joint disorders. Patients were identified from the departmental operative register and hospital medical records, and only those with complete clinical documentation and adequate postoperative follow-up were included for analysis.

Data Collection: Data were retrieved from the hospital case record, operative register, discharge summary, laboratory report, radiology report, microbiology report and outpatient follow-up record kept in the Department of Orthopedics, retrospectively. Data concerning demographic characteristics (age, sex, BMI), clinical diagnosis, indication for arthroplasty, associated comorbidities (DM, HT, CKD, RA, obesity, smoking, anemia, and others), previous use of corticosteroid, laboratory parameters including hemoglobin, TLC, serum albumin, ESR, and CRP before surgery, type of arthroplasty performed (THA/TKA), and duration of hospital stay were obtained using a structured data collection proforma. Postoperative complications were also recorded. Periprosthetic joint infection was defined by clinical manifestations, laboratory tests, microbiological culture, and a treating surgeon diagnosis in the postoperative follow-up period. Then the incidence of PJI and associated risk factors was assessed.

Inclusion Criteria

Patients fulfilling the following criteria were included in the study:

- Patients aged 18 years or older.
- Patients who underwent primary total hip arthroplasty (THA) or primary total knee arthroplasty (TKA) during the study period.
- Patients with complete preoperative, operative, and postoperative medical records.
- Patients with a minimum postoperative follow-up of 12 months.

Exclusion Criteria

The following patients were excluded from the study:

- Patients who underwent revision hip or knee arthroplasty as the primary procedure.
- Patients who had undergone primary arthroplasty at another institution.
- Patients with incomplete or missing medical records.
- Patients with less than 12 months of postoperative follow-up.
- Patients with active infection at the surgical site before the primary arthroplasty.

Procedure: All records of patients who had primary total hip or knee arthroplasty during the study period were reviewed in the hospital. The patients were selected from the departmental operative database using the inclusion and exclusion criteria. A standardized data collection sheet was used to obtain demographic data, indication for surgery, comorbid conditions, history of corticosteroid use, laboratory investigations, surgical details, and postoperative clinical records. Follow-up records were reviewed to check for evidence of periprosthetic joint infection according to the clinical features noted in the medical record including persistent wound discharge, pain, swelling, erythema, fever, positive microbiological cultures, imaging where available and the orthopedic surgeon's diagnosis. Patients were divided into two groups, PJI and non-PJI, and the incidence of PJI was determined. The two groups were compared with each other in terms of potential demographic, clinical, and laboratory risk factors to determine factors that are associated with the development of PJI following TJA.

Statistical Analysis: Collected data were inputted into Microsoft excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 26.0 (IBM Corp., Armonk, NY, USA). The data were presented as mean ± SD for continuous variables and frequency and percentage for categorical variables. Independent student's t-test was used for continuous variables, and the Chi square test or Fisher's exact test was used for categorical variables to compare patients with and without PJI. The statistically significant variables in univariate analysis were taken and included in a multivariate logistic regression to determine independent risk factors for PJI. Association was reported as odds ratios (ORs) and 95% confidence intervals (CIs). A p value of < 0.05 was used as the threshold for statistical significance in all analyses".

Result

Table 1 shows the demographic data of the 120 patients who had primary total joint arthroplasty during this period. The mean age of the study population was 63.8 ± 9.4 years, with the largest proportion of patients belonging to the 60–69 years age group (35.0%), followed by 50–59 years (28.3%), ≥70 years (21.7%), and 18–49 years (15.0%). Females (56.7%) made up a slightly larger proportion of the

study population than males (43.3%). With respect to body mass index (BMI), 38.3% of patients were overweight (BMI 25–29.9 kg/m²), 33.3% were obese (BMI ≥30 kg/m²), while 28.3% had a BMI below 25 kg/m².

Table 1: Baseline Demographic Characteristics of the Study Population (N = 120)		
Variable	**Frequency (n)**	**Percentage (%)**
Age Group (years)		
18–49	18	15
50–59	34	28.3
60–69	42	35
≥70	26	21.7
Mean age (years)	**63.8 ± 9.4**	
Gender		
Male	52	43.3
Female	68	56.7
Body Mass Index (kg/m²)		
<25	34	28.3
25–29.9	46	38.3
≥30	40	33.3

The clinical characteristics and comorbidities of the study participants are summarized in Table 2. The most frequent comorbidities were hypertension (46.7 %), diabetes mellitus (35.0 %), obesity (33.3 %) and anemia (31.7 %). Twenty-five.0% had a history of smoking and 20.0% had hypoalbuminemia. The prevalence of rheumatoid arthritis and chronic kidney disease were noted to be 10.0% and 7.5% respectively. In addition, 12.5% of patients had a prior history of steroid use noted prior to surgery.

Table 2: Clinical Characteristics and Comorbidities of the Patients (N = 120)		
Variable	**Frequency (n)**	**Percentage (%)**
Diabetes mellitus	42	35
Hypertension	56	46.7
Obesity (BMI ≥30 kg/m²)	40	33.3
Smoking history	30	25
Rheumatoid arthritis	12	10
Chronic kidney disease	9	7.5
Anemia (Hb <12 g/dL)	38	31.7
Corticosteroid use	15	12.5
Hypoalbuminemia (<3.5 g/dL)	24	20

The operative characteristics of patients undergoing TJA are summarized in Table 3. The distribution of the procedures was 61.7% total knee arthroplasty (TKA) and 38.3% total hip arthroplasty (THA). Surgery was most commonly indicated for primary osteoarthritis (56.7%) followed by avascular necrosis (15.0%), post-traumatic arthritis (13.3%), rheumatoid arthritis (10.0%) and other (5.0%). The mean operative time was 112.6 ± 18.9 minutes, and the mean postoperative hospital stay was 8.9 ± 2.8 days.

Table 3: Operative Characteristics of Patients Undergoing Total Joint Arthroplasty (N = 120)		
Variable	**Frequency (n)**	**Percentage (%)**
Type of Arthroplasty		
Total Knee Arthroplasty (TKA)	74	61.7
Total Hip Arthroplasty (THA)	46	38.3
Indication for Surgery		
Primary osteoarthritis	68	56.7
Rheumatoid arthritis	12	10
Avascular necrosis	18	15
Post-traumatic arthritis	16	13.3
Others	6	5
Mean duration of surgery (minutes)	**112.6 ± 18.9**	
Mean hospital stay (days)	**8.9 ± 2.8**	

Table 4 shows the rate of periprosthetic joint infection (PJI) after TJA. The 10 patients (8.3%) with P.J.I had a mean time to diagnosis of 19.5 months from surgery while the 110 patients (91.7%) without P.J.I had a mean follow-up of 17.4 months without diagnosis. These results suggest that the overall incidence of PJI was 8.3% in the current study.

Table 4: Incidence of Periprosthetic Joint Infection Following Total Joint Arthroplasty (N = 120)		
Outcome	**Frequency (n)**	**Percentage (%)**
Periprosthetic Joint Infection (PJI)	10	8.3
No PJI	110	91.7

Demographic and clinical parameters were compared between patients with and without periprosthetic joint infection (PJI) (Table 5). Patients with PJI and those who were not infected were of similar mean age (p = 0.143). There was also no significant difference for male gender (p = 0.265). Patients who developed PJI, however, had significantly increased prevalence of obesity (BMI ≥30 kg/m2) (p=0.014), diabetes mellitus (p=0.018), smoking history (p=0.048), rheumatoid arthritis (p=0.039), hypoalbuminemia (p=0.020), and anemia (p=0.049). The association of chronic kidney disease with PJI was not statistically significant (p = 0.132).

Table 5: Comparison of Demographic and Clinical Variables Between Patients with and Without Periprosthetic Joint Infection			
Variable	**PJI (n=10)**	**Non-PJI (n=110)**	**p-value**
Mean age (years)	67.9 ± 8.1	63.4 ± 9.5	0.143
Male gender	6 (60.0%)	46 (41.8%)	0.265
BMI ≥30 kg/m²	7 (70.0%)	33 (30.0%)	0.014
Diabetes mellitus	7 (70.0%)	35 (31.8%)	0.018
Smoking history	5 (50.0%)	25 (22.7%)	0.048
Rheumatoid arthritis	3 (30.0%)	9 (8.2%)	0.039
Chronic kidney disease	2 (20.0%)	7 (6.4%)	0.132
Hypoalbuminemia	5 (50.0%)	19 (17.3%)	0.02
Anemia	6 (60.0%)	32 (29.1%)	0.049

Operative and laboratory factors are compared between patients with and without periprosthetic joint infection in Table 6. The distribution of total hip arthroplasty (THA) and total knee arthroplasty (TKA) was similar, and not statistically different between the two groups (p = 0.908). PJI patients did, however, experience a much longer operating room (OR) time, 129.4 ± 15.8 minutes vs. 111.1 ± 18.2 minutes, p = 0.003, and a longer postoperative hospital stay, 12.8 ± 3.2 days vs. 8.5 ± 2.4 days, p < 0.001, than non-PJI patients. Moreover, the presence of corticosteroid use, and higher levels of the inflammatory markers (ESR/CRP) were significantly higher in the PJI group with P values of 0.011 and 0.010, respectively.

Table 6: Comparison of Operative and Laboratory Variables Between Patients with and Without Periprosthetic Joint Infection			
Variable	**PJI (n=10)**	**Non-PJI (n=110)**	**p-value**
THA	4 (40.0%)	42 (38.2%)	0.908
TKA	6 (60.0%)	68 (61.8%)	
Mean operative time (minutes)	129.4 ± 15.8	111.1 ± 18.2	0.003
Mean hospital stay (days)	12.8 ± 3.2	8.5 ± 2.4	<0.001
Corticosteroid use	4 (40.0%)	11 (10.0%)	0.011
Elevated ESR/CRP	6 (60.0%)	24 (21.8%)	0.01

Table 7 shows the multivariate logistic regression analysis conducted to determine risk factors independent of PJI after total joint arthroplasty. Diabetes mellitus (OR = 3.84; p = 0.025), obesity (BMI ≥30 kg/m²) (OR = 3.21; p = 0.041), hypoalbuminemia (OR = 3.67; p = 0.032), operative duration exceeding 120 minutes (OR = 4.18; p = 0.017), and preoperative corticosteroid use (OR = 3.42; p = 0.048) were identified as significant independent predictors of PJI. The increased odds of infection with smoking history and rheumatoid arthritis were not significant after multivariate adjustment (p > 0.05). The results indicate that not just patient-related but also surgery-related factors play an important role in the incidence of PJI after TJA.

Table 7: Multivariate Logistic Regression Analysis of Independent Risk Factors for Periprosthetic Joint Infection			
Variable	**Adjusted OR**	**95% CI**	**p-value**
Diabetes mellitus	3.84	1.18–12.46	0.025
BMI ≥30 kg/m²	3.21	1.05–9.82	0.041
Hypoalbuminemia	3.67	1.12–11.94	0.032
Operative time >120 minutes	4.18	1.29–13.52	0.017
Corticosteroid use	3.42	1.01–11.61	0.048
Smoking history	2.26	0.71–7.15	0.165
Rheumatoid arthritis	2.18	0.59–8.04	0.243

Discussion

One hundred and twenty patients who had undergone primary total joint arthroplasty (TJA) were assessed in this retrospective observational study, aiming to identify periprosthetic joint infection (PJI) rates and risk factors. The average age of the study population was 63.8 ± 9.4 years, with the majority (35.0%) being in the age group 60-69 years and 28.3% in the 50-59 years age group. The study population was slightly more female (56.7%) than male (43.3%) and over two-thirds of the population was overweight or obese. These findings are similar to the findings of Kunutsor *et al.,* who found that patients undergoing primary TJA are predominantly older, overweight, and obese individuals and these factors have been associated with postoperative complications such as PJI [13]. The same goes for Tande and Patel, who found that advanced age and high body mass index are common among arthroplasty patients as they are more likely to experience degenerative joint diseases [5]".

In the present study, hypertension (46.7%) was the most prevalent comorbidity, followed by diabetes mellitus (35.0%), obesity (33.3%), anemia (31.7%), smoking history (25.0%) and hypoalbuminemia (20.0%). The findings of these observations are similar to the findings of Zhu et al. who found that metabolic disorders, anemia, and nutritional deficiency are prevalent among patients receiving total joint arthroplasty and significantly affect the healing process and risk of postoperative infection [14]. Likewise, Dale *et al.* found diabetes mellitus, obesity and smoking as common preadmission comorbidities that affect the healing of the operative site and the risk of surgical site infection following total joint replacement surgery [15]. The relatively high prevalence of the comorbid conditions in this study emphasizes the need for a thorough preoperative optimization process prior to arthroplasty.

As for operative characteristics, total knee arthroplasty (61.7%) was more common than total hip arthroplasty (38.3%) with the majority of procedures (56.7%) indicated by primary osteoarthritis. The mean operative duration was 112.6 ± 18.9 minutes, and the mean hospital stay was 8.9 ± 2.8 days. Lenguerrand *et al.* reported similar findings, with osteoarthritis being the most common reason for primary TJA, and TKA accounted for a greater percentage of arthroplasty surgeries than THA in most tertiary care centers [16]. Previous studies have also reported similar operation times of 100–120 min when assessing infection-related outcomes after primary joint arthroplasty [12].

The overall rate of PJI in this study was 8.3% (10/120 patients). This incidence is significantly higher than large international registry studies reporting an incidence of 0.5%-2.5% [17] on average. For example, Gundtoft *et al.* reported an incidence of ~1.0% after primary hip arthroplasty, while Kurtz et al. reported rates from 2.0% to 2.4% in the USA [8]. Similarly, Kim *et al.* conducted a study based on CDM and reported an overall incidence rate of 0.27% [19]. This higher prevalence in the present study could be due to differences in number of patients, retrospective design of hospital-based study, patient selection, referral bias of the tertiary care center, differing diagnostic criteria, and surveillance methods. In addition, the number of patients was relatively small, which can have introduced an overestimate of the incidence compared to multicenter registry studies.

Several other important predictors of infection were identified by operative and laboratory variables. Patients who developed PJI had significantly longer operative durations (129.4 ± 15.8 vs. 111.1 ± 18.2 minutes; p=0.003) and prolonged postoperative hospital stays (12.8 ± 3.2 vs. 8.5 ± 2.4 days; p<0.001). Previous studies by Peersman *et al.* also showed a correlation between longer operative time and more exposure to bacteria and handling of tissue, leading to a higher risk of infection [9]. The use of corticosteroid was also significantly higher in infected patients (40.0% vs. 10.0%, p=0.011), which is consistent with previous findings that immune response is impaired and wound healing delayed in chronic corticosteroid use.

Smoking history and RA had an increased odds ratio for infection, but these variables were not independent of other patient-related factors and did not reach the level of significance after multivariate adjustment. The present results confirm previous data showing that PFs and surgery-related factors play significant roles in the pathogenesis of PJI and that patients should be carefully evaluated preopera-

tively, optimized in their nutritional and metabolic parameters, and surgery should not be prolonged unnecessarily and should avoid unnecessary use of corticosteroids, in order to decrease postoperative infectious complications.

Conclusion

Despite the development of new surgical techniques and perioperative care, the present retrospective observational study showed that PJI is still an important complication after PTA. The results show that patient factors and surgical factors are responsible for the onset of infection, with comorbid conditions, poor nutritional status, longer operative time, and the use of preoperative steroids being significant risk factors. The early detection and optimization of risk factors that can be modified prior to surgery, combined with careful surgical technique, strict perioperative infection control measures and comprehensive perioperative management, can help decrease the incidence of periprosthetic joint infection and enhance postoperative results. These results are helpful for risk stratification and preventive measures during routine orthopedic surgery and may help improve the safety and long-term success of TJAs in the same tertiary care environment.

References

1. Kurtz S, Ong K, Lau E, Mowat F, Halpern M. Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030. Jbjs. 2007 Apr 1;89(4):780-5.
2. Learmonth ID, Young C, Rorabeck C. The operation of the century: total hip replacement. The Lancet. 2007 Oct 27;370(9597):1508-19.
3. Zimmerli W, Trampuz A, Ochsner PE. Prosthetic-joint infections. New England journal of medicine. 2004 Oct 14;351(16):1645-54.
4. Del Pozo JL, Patel R. Infection associated with prosthetic joints. New England Journal of Medicine. 2009 Aug 20;361(8):787-94.
5. Tande AJ, Patel R. Prosthetic joint infection. Clinical microbiology reviews. 2014 Apr;27(2): 302-45.
6. Osmon DR, Berbari EF, Berendt AR, Lew D, Zimmerli W, Steckelberg JM, Rao N, Hanssen A, Wilson WR. Executive summary: diagnosis and management of prosthetic joint infection: clinical practice guidelines by the Infectious Diseases Society of America. Clinical infectious diseases. 2013 Jan 1;56(1):1-0.
7. Arciola CR, Campoccia D, Speziale P, Montanaro L, Costerton JW. Biofilm formation in Staphylococcus implant infections. A review of molecular mechanisms and implications for biofilm-resistant materials. Biomaterials. 2012 Sep 1;33(26):5967-82.
8. Trampuz A, Zimmerli W. Prosthetic joint infections: update in diagnosis and treatment. Swiss medical weekly. 2005 May 7;135(1718):243-.
9. Peersman G, Laskin R, Davis J, Peterson M. Infection in total knee replacement: a retrospective review of 6489 total knee replacements. Clinical Orthopaedics and Related Research®. 2001 Nov 1;392:15-23.
10. Pulido L, Ghanem E, Joshi A, Purtill JJ, Parvizi J. Periprosthetic joint infection: the incidence, timing, and predisposing factors. Clinical Orthopaedics and Related Research®. 2008 Jul 1;466(7): 1710-5.
11. Bozic KJ, Lau E, Kurtz S, Ong K, Berry DJ. Patient-related risk factors for postoperative mortality and periprosthetic joint infection in medicare patients undergoing TKA. Clinical Orthopaedics and Related Research®. 2012 Jan;470(1): 130-7.
12. Parvizi J, Gehrke T. Definition of periprosthetic joint infection. The Journal of arthroplasty. 2014 Jul 1; 29(7):1331.
13. Kunutsor SK, Whitehouse MR, Blom AW, Beswick AD, Inform Team. Patient-related risk factors for periprosthetic joint infection after total joint arthroplasty: a systematic review and meta-analysis. PloS one. 2016 Mar 3;11(3):e0150866.
14. Zhu Y, Zhang F, Chen W, Liu S, Zhang Q, Zhang Y. Risk factors for periprosthetic joint infection after total joint arthroplasty: a systematic review and meta-analysis. Journal of Hospital Infection. 2015 Feb 1;89(2):82-9.
15. Dale H, Hallan G, Espehaug B, Havelin LI, Engesæter LB. Increasing risk of revision due to deep infection after hip arthroplasty: a study on 97,344 primary total hip replacements in the Norwegian Arthroplasty Register from 1987 to 2007. Acta orthopaedica. 2009 Dec 1;80(6): 639-45.
16. Lenguerrand E, Whitehouse MR, Beswick AD, Jones SA, Porter ML, Blom AW. Revision for prosthetic joint infection following hip arthroplasty: Evidence from the National Joint Registry. Bone & joint research. 2017 Jun 1;6(6):391-8.
17. Turppo V. Validity of the Finnish arthroplasty register and outcomes of hip and knee arthroplasty.
18. Ong KL, Kurtz SM, Lau E, Bozic KJ, Berry DJ, Parvizi J. Prosthetic joint infection risk after total hip arthroplasty in the Medicare population. The Journal of arthroplasty. 2009 Sep 1;24(6): 105-9.
19. Bozic KJ, Ward DT, Lau EC, Chan V, Wetters NG, Naziri Q, Odum S, Fehring TK, Mont MA, Gioe TJ, Della Valle CJ. Risk factors for periprosthetic joint infection following primary total hip arthroplasty: a case control study. The Journal of arthroplasty. 2014 Jan 1;29(1):154-6.