EDITORIAL

Circumstances that Increase the Risk of Periprosthetic Joint Infection after Total Knee Arthroplasty

E. Carlos Rodriguez-Merchan, MD, PhD[1]

1. Department of Orthopedic Surgery, Hospital Universitario La Paz, Madrid, Spain

Periprosthetic joint infection (PJI) is a severe adverse event that may happen following total knee arthroplasty (TKA). In fact, PJI significantly affects both the healthcare system and individuals because of its elevated costs and mortality rates.[1-5]

The aim of this Editorial is to analyze a number of circumstances that can increase the risk of PJI after TKA. To accomplish this objective, a search of the literature in PubMed on 18 September 2025, using "PJI TKA 2025" as keywords, was carried out. A total of 139 articles were encountered, of which 16 were analyzed because they were directly related to the title of this Editorial (inclusion criterion). The remaining 123 were excluded because they did not meet the aforementioned inclusion criterion.

In a study with level III of evidence Nikman et al (May 2025) compared the rates of PJI between individuals who experienced arthroscopic lysis of adhesions (LOA) after TKA due to postoperative limited range of motion (ROM) with those who did not experience arthroscopic LOA. Nikman et al found that individuals who experienced LOA had greater rates of PJI (2.7% versus 1.3%) than those who did not. Individuals who experienced LOA had significantly higher odds of PJI [Odds Ratio (OR), 2; $p < 0.014$) within 1 year after the initial TKA.[6] Therefore, it is essential that patients understand that good postoperative rehabilitation after TKA is crucial to prevent arthrofibrosis and the need for arthroscopic LOS, which would increase their risk of PJI.

A special circumstance is that of patients who suffer from rheumatoid arthritis (RA) and require TKA. Mori et al (May 2025) observed that RA individuals have greater risk of PJI than osteoarthritis patients.[7]

According to Goel et al (retrospective cohort study), an increasing number of patients with chronic anticoagulation (CA) require TKA. In their study they included patients treated with warfarin, low-molecular-weight heparin or direct oral anticoagulants within 6 months both prior to and following TKA. They compared the rates of PJI after TKA between individuals who were on CA versus those who were not on CA. At 2 years, the rate of PJI was significantly greater in the CA cohort (0.4 versus 1.1%).[8]

With regard to the use of antibiotics, the articles by Rumalla et al,[9] and McNamara et al,[10] are very interesting. Rumalla et al reported (June 2025) that cefazolin prophylaxis substantially lowered 3-month PJI risk after TKA compared to other antibiotics. Using a national database investigation they compared three prophylaxis cohorts: cefazolin only, noncefazolin, or cefazolin plus another antibiotic. The study showed 90-day PJI rates of 1% in noncefazolin versus 0.7% in both cefazolin-only and combination groups ($p < 0.001$). After adjusting for age, sex, payer, race, ethnicity, and comorbidities, both cefazolin-only and cefazolin plus another antibiotic had lower odds of PJI. Therefore, cefazolin prophylaxis significantly lowered 3-month PJI risk following TKA compared to noncefazolin antibiotics.[9]

In a high-risk surgical group McNamara et al compared the rates of PJI between patients receiving intraosseous (IO) vancomycin and those receiving intravenous (IV) vancomycin. It was found that the IO vancomycin cohort had a lower rate of PJI through 1-year follow-up. The frequency of PJI was substantially lower in the IO cohort compared to the IV cohort at 1-month (0.3% versus 2.1%,), 3-month (0.9% versus 3.1%), and 1-year follow-up (1.6% versus 4.9%).[10]

Another special circumstance is when the patient requiring TKA has a previous history of cellulitis. In the study of Erling et al (July 2025), individuals who had cellulitis of the lower limbs prior to TKA were matched 1:1 to those who did not have a history of cellulitis. Erling et al found that individuals who had prior cellulitis had a greater frequency of PJI than controls (7.2% versus 3.1%). Besides, individuals who had cellulitis within 1 year of surgery had greater PJI frequency than individuals who had more remote cellulitis (9.3% versus 4.7%). It seemed that prior cellulitis was a risk factor for PJI following TKA, particularly when it happens within a year of surgery.[11]

Telang et al found (July 2025) that individuals who had preoperative anemia (hemoglobin of 10 g/dL) had a 1.86-fold greater risk of PJI than individuals without preoperative anemia.[12]

Corresponding Author: E. Carlos Rodriguez-Merchan, Department of Orthopedic Surgery, Hospital Universitario La Paz, Madrid, Spain

Email: ecrmerchan@hotmail.com

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Verhey et al (August 2025) found that a clostridium difficile infection within 2 years before TKA was independently related to greater odds of PJI.[13]

A healthcare database was used by Telang et al (August 2025) to retrospectively identify all primary TKA patients between 2016 and 2021 with available preoperative albumin values within a 28-day window. Telang et al observed that individuals experiencing TKA who have a preoperative albumin < 3.1 g/dL (hypoalbuminemia) were at greater risk of PJI.[14]

One of the circumstances in which controversy persists concerns intraarticular injections prior to TKA. In an observational cohort study Nin et al (March 2025) found that intraarticular injections (corticosteroids, hyaluronic acid, joint aspiration) carried out before to TKA did not increase the risk of developing postoperative PJI (rates of PJI at 6 months were similar between individuals with and without injections).[15] However, in the study of Jones et al (March 2025) they analyzed patients experiencing TKA who received an hyaluronic acid injection without a corticosteroid injection within 12 months prior to surgery. The hyaluronic acid cohort was matched 1:1 to a control cohort experiencing no preoperative injections. Jones et al found that hyaluronic acid injections within 1 month before TKA caused significant increase in rates of PJI at 90-day, 180-day, 1-year, and 2-year after surgery. Hyaluronic acid injections between 30-60 days before TKA led to greater rates of PJI at 1-year after surgery.[16] Therefore, the fact that intraarticular injections increase the risk of PJI after TKA requires further and better studies to resolve the current controversy.

Conclusion

All the circumstances analyzed in this Editorial are of great practical interest, as they are aimed at ensuring that the risk of PJI following TKA does not increase unnecessarily. However, given that the level of evidence in the published studies is not very high, all the conclusions mentioned here must be confirmed by studies with a high level of scientific evidence. Until this is achieved, I believe it is worth taking into account the analysis in this article, as PJI is such a devastating adverse event that anything that can be done to prevent or minimize should be welcomed.

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E. Carlos Rodriguez-Merchan MD, PhD[1]

1 Department of Orthopedic Surgery, Hospital Universitario La Paz, Madrid, Spain

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