HK87: Should antibiotic prophylaxis be altered for patients undergoing primary joint arthroplasty secondary to prior septic arthritis?

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Response/Recommendation: Given the relatively high risk (10-15%) of periprosthetic joint infection (PJI) in patients with prior septic arthritis, patients should receive prophylaxis directed towards the previous causative pathogen or standard perioperative prophylaxis if the previous pathogen is unknown. Consideration should be given to extending the course of antibiotic prophylaxis in this patients population.

Strength of Recommendation: Limited

Delegate Vote:

Rationale:

Periprosthetic joint infection (PJI) is one of the most devastating causes of morbidity after total joint arthroplasty surgeries. One of the most important non-patient related factors that can prevent PJI is antibiotic prophylaxis. Preoperative antibiotic prophylaxis before total joint arthroplasty is now recommended by most guidelines [1][2]. Septic arthritis is one of the common causes of cartilage damage and secondary arthritis that is eventually treated with total joint arthroplasty. A prior history of septic arthritis increases the risk of PJI after total joint arthroplasty in up to 15% of patients, putting these patients at higher risk of infection related complications and morbidity [3][4].

In order to address the question posed, we performed a comprehensive systematic review on the subject. A search of PubMed and Scopus databases using the MeSH terms developed by libriarins, was conducted. Initial search yielded 2,272 potential studies. We excluded 2,256 articles by title and abstract screening. 16 articles were eligible for full-text screening. Finally, nine articles were included in our review. All included studies had limited data with few details about the antibiotic regimens used.

In one study by Bettencourt et al., the risk of PJI between two cohorts was compared, with the first cohort undergoing total knee or hip arthroplasty after a native joint septic arthritis and the second cohort underwent TJA but after osteoarthritis (OA). The septic arthritis cohort had an 8% higher risk of PJI and superficial wound infection (9% risk compared to 1% in OA cohort). They reported an increased rate of reoperation and aseptic revisions in the septic arthritis cohort. They

also found no relation between the time from the diagnosis of septic arthritis to TJA and the risk of PJI. They used organism specific antibiotic prophylaxis in most patients [5][6]. Similarly, Sultan et al. studied 62 patients who underwent total knee arthroplasty (TKA) and total hip arthroplasty (THA) after a native joint septic arthritis. The mean interval from treatment of the native septic joint to their total joint arthroplasty was 3.7 years. The most commonly used antibiotic prophylaxis agents were first generation cephalosporins and vancomycin administered intravenously for at least four weeks. The study reported a higher risk of PJI in their cohort reaching 8%[7]. Chen et al. studied 22 patients who underwent TKA after native joint septic arthritis. They used double antibiotic treatment for longer duration for prophylaxis against PJI [8]. Both studies reported that factors such as smoking, multiple debridement surgeries to eradicate the native infection, polymicrobial infection, or high-virulence pathogens causing the native infection, required more aggressive treatment sometimes even in a two stage arthroplasty and reported that those factors are strongly associated with a high risk of PJI and poor function of the joint arthroplasty [7][8].

Portier et al. reported the results of 49 patients undergoing TJA after prior septic arthritis. They used intraoperative antibiotics directed towards the causative organism of the native septic arthritis and continued until the results of the intraoperative cultures were obtained. If the cultures remained negative, the antibiotics were stopped after seven to 14 days. But, if the cultures were positive the regimen was extended for a prolonged period. Most patients received an intravenous first generation cephalosporins (e.g. cefazolin), amoxicillin or vancomycin [9]. The risk of PJI was about 10% in their cohort and only one patient had a PJI with the same organism of the native septic arthritis (Staph. aureus), which was considered a new infection, given the long duration between the native joint septic arthritis and PJI. [9]. There was no consensus on the time period between the cure of native septic arthritis and total joint arthroplasty. Some authors recommended at least 2 years to ensure complete infection cure. Others recommended a shorter period of 3-6 months[7][9]. Huang et. Al. reported the results of 14 patients with septic hip arthritis treated in a two-stage procedure with a 100% success rate during the period of follow up. All patient received intravenous antibiotics against the organism causing the native septic arthritis, but if not organism was identified, the patients received a combination of a first generation cephalosporin and gentamicin[10]. Jerry et al. used systemic antibiotic prophylaxis(semisynthetic penicillin or cephalosporin)for 48-72 hoursin 65 patients undergoing primary TKA after a native knee septic arthritis. Recurrence of infection occurred in five patients (5/65) with Staphylococcal species [11]. Ohlmeier et al. reported the results of treatment of 68 patients with prior septic arthritis of the knee receiving TKA with the use of empirical Flucloxacillin (32%), Cefazolin (22%) Vancomycin (21%) Ampicillin/Sulbactam (12%) and others: Fosfomycin, Imipenem, Meropenem (13%). Two patients (2.9 %) had septic revisions during the period of follow-up[12]. Kim et al. reported the use of 2-day regimen of intravenous antibiotic prophylaxis with cephalosporins in 44 hips with native septic arthritis [13]. Mainard et al. reported treatment of 92 cases of hip and knee arthroplasty after a native septic arthritis and used prophylactic antibiotics according to intraoperative samples[14].

Conclusion:

Because of the higher risk of periprosthetic joint infection (PJI) in patients with prior septic arthritis reaching up to 10 to 15% risk. Based on the reviewed evidence, two primary approaches may be suggested:

1. **Extended Prophylaxis**: Administer intravenous antibiotics for 2–14 days postoperatively. Common regimens include first-generation cephalosporins (e.g., cefazolin) or vancomycin, depending on patient-specific factors such as prior colonization or allergies.
2. **Pathogen-Specific Prophylaxis**: Utilize intravenous antibiotics targeting the organism responsible for native septic arthritis. If the causative pathogen is unknown, consider broad-spectrum combinations of a first-generation cephalosporin with quinolones, vancomycin or Ampicillin/Sulbactam. Antibiotics can be discontinued once intraoperative cultures are confirmed negative. If cultures are positive, therapy should be extended and guided by culture and sensitivity results**.**

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