

Abstract

Background: South African data on the bacteriology and sensitivity profile of periprosthetic joint infection is lacking. Our aim is to determine the characteristics of periprosthetic joint infection in a South African clinical setting by identifying the most common microorganisms cultured and establishing their antibiotic sensitivities in order to propose the most appropriate empiric antibiotic treatment regimen. In the case of two-stage revision procedures with positive cultures during the second stage, we aim to compare the microorganisms cultured during the first stage *versus* the second stage. Furthermore, we aim to correlate the bacterial culture during the second stage with the erythrocyte sedimentation rate/ C-reactive protein result.

Patients and Methods: We performed a retrospective cross-sectional study looking at all hip and knee periprosthetic joint infections in patients 18 years and older, treated at a government institution and a private revision practice in Johannesburg, South Africa between January 2015 and March 2020. Data were collected from the Charlotte Maxeke Johannesburg Academic Hospital hip and knee and the Johannesburg Orthopaedic hip and knee databanks.

Results: We included 69 patients whom underwent 101 procedures relating to periprosthetic joint infection. Positive cultures were found in 63 samples and 81 different microorganisms were identified. The most common microorganisms cultured were *Staphylococcus aureus* ($n = 16$, 19.8%) and *Coagulase negative Staphylococcus* ($n = 16$, 19.8%), followed by *Streptococci* species ($n = 11$, 13.6%). The positive yield in our cohort was 62.4% ($n = 63$). A polymicrobial growth was found in 19% ($n = 12$) of the culture-positive specimens. Of all the microorganisms cultured, 59.2% ($n = 48$) were Gram-positive *versus* 35.8% ($n = 29$) Gram-negative. The remainder were fungal and anaerobic microorganisms at 2.5% ($n = 2$) each. Gram-positive microorganisms displayed 100% sensitivity to Vancomycin and Linezolid, whereas Gram-negative microorganisms displayed 82% sensitivity towards Gentamycin and 89% sensitivity towards Meropenem respectively.

Conclusion: Our study identifies the bacteriology of periprosthetic joint infections and their sensitivities in a South African clinical setting. We recommend that antibiotic-loaded cement spacers and systemic antibiotic regimens should consist of Meropenem or Gentamycin; Vancomycin and Rifampicin to achieve the broadest spectrum of coverage and most likely success in eradicating infection.