Prosthetic Joint Infection: Clinical Outcomes of a Multidisciplinary Approach in a Tertiary Care Centre

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Background

An aging population has resulted in increasing rates of joint replacement surgery. Prosthetic joint infection (PJI) is common and is one of the most serious complications of joint replacement, occurring in approximately 1-2% of cases[(1)]. The diagnosis can be challenging, and the treatment typically requires extensive courses of antimicrobials and surgical intervention[(2)]. Galway University Hospital has a combined infectious diseases and orthopaedic programme treating PJI according to IDSA guidelines. There is little data on clinical outcomes of this approach.

Methods

This was a single-centre retrospective study. Patients were identified using the Hospital In-Patient Enquiry (HIPE) health information system and Outpatient Parenteral Antimicrobial Therapy (OPAT) records. All patients treated for first-episode PJI at our institution from 01/01/2015 until 31/12/2019 were included. Patients were excluded if the surgical intervention for their PJI was performed in an outside institution, or if they were lost to follow-up. Clinical, microbiological, and outcome data were collected using the electronic health record.

The 2-sample t-test was used to analyse continuous variables. Logistic regression analysis was used to determine if there were any predictors of outcome. Chi-square and Fisher's exact tests were used for comparing proportions depending on group size. All statistics were performed using Minitab software.

PJI was defined using the IDSA definition[(2)]. Treatment success was defined as being infection-free with or without suppressive antimicrobials at time of data collection. Relapse of same infection, reinfection with a different organism, and death due to PJI were all considered treatment failure.

Results

91 patients were identified. 12 were not included as they did not meet the IDSA definition of PJI. 12 were excluded (4 lost to follow-up, 8 PJI surgery in another hospital). 67 patients were included in the final analysis. 70.1% (47/67) of patients were male. Median age was 69 (range 32-91). 23.9% (16/67) had an underlying inflammatory arthritis. 77.6% (52/67) of PJI involved the hip, and 22.4% (15/67) the knee. 22.4% (15/67) were early infections (<1 month from surgery), 77.6% (52/67) were late. Median hospital stay was 42 days (range 10-183), and median duration of IV antimicrobials was 42 days (range 0-90). Median follow-up was 44 months (range 15-85). 23.9% (16/67) were bacteraemic, of these *S. aureus* accounted for 75.0% (12/16). Debridement, antibiotics and implant retention (DAIR) was the commonest treatment for early PJI (7/15, 46.7%). Two-stage exchange was commonest for late PJI (28/52, 53.8%). 62.7% (42/67) were infection-free at follow-up. Relapse occurred in 19.4% (13/67), 10.4% (7/67) were reinfected with a different organism. There was one death from PJI (1.6%), and 4 from other causes (5.9%). In early PJI, DAIR was successful in 71.4% (5/7), with 28.6% (2/7) relapsing. Two-stage exchange was successful in 71.4% (20/28) of late PJI, with 10.7% (3/28) relapsing, and 14.3% (4/28) becoming reinfected. Age, sex, inflammatory markers, microorganism or comorbidities did not predict outcome.

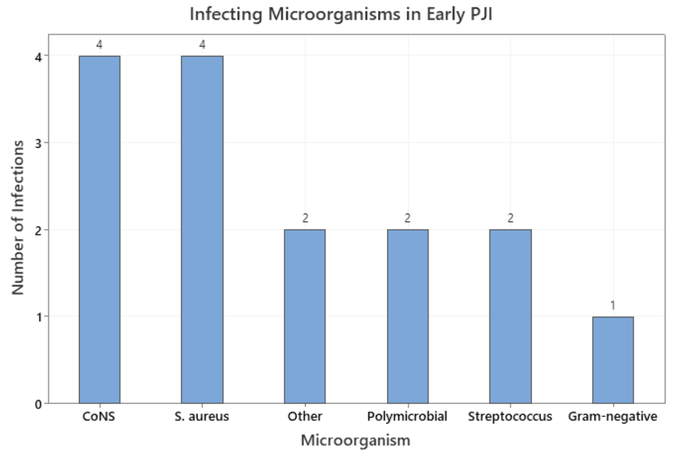

***Figure 1.* Bar charts showing the most common infecting microorganisms in early and late PJI**

Abbreviations: CoNS: coagulase-negative Staphylococci

Conclusion

PJI is associated with long length of hospital stay and antimicrobial treatment. Of interest, we found a high prevalence of inflammatory arthritis in our cohort.

In a real-world setting, DAIR can be successful in appropriately selected patients with early PJI. Two-stage exchange has low rates of relapse in late PJI. We advocate for a multidisciplinary approach to the management of this complex infection with involvement of orthopaedic and infectious diseases specialists in order to achieve high success rates at first intervention.

References

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