Antibiotic Resistance in PJI, is the Prevalence Changing?

Calvin Chandler, Jesse E Otero¹, Alexander Dombrowsky, Thomas K Fehring

¹Orthocarolina Hip and Knee Center

INTRODUCTION: Periprosthetic joint infection (PJI) can be a catastrophic complication following total joint arthroplasty, which places a significant burden on patients, surgeons, and the economy. Traditionally, PJI has been predominantly associated with gram-positive organisms such as Staphylococcus aureus and Staphylococcus epidermidis, which are common causes of infections in hospital settings. However, recent studies have suggested a shift in the microbial etiology within hospitals and an increasing incidence of gram negative and antibiotic resistant organisms (eg. MRSA, MRSE, VRE, coagulase negative staphylococcus). Understanding the evolution of pathogenicity and pathogen prevalence may help guide future treatment and prevention of PJI.

METHODS: A retrospective review of our institutional database was performed for surgically treated PJI between January 1, 2010 and December 2021. 916 patients were identified who met Musculoskeletal Infection Society (MSIS) criteria for PJI. Incidence of patients whose infection was caused by drug resistant organisms was recorded and compared to the incidence of those with drug-sensitive infection

RESULTS: Of the 916 cases identified, 27.5% (n=337) of the organisms identified were resistant. Of the resistant organisms, MRSA was most common (62.4%), followed by MRSE (22.2%), coagulase negative staphylococcus (14.6%) and VRE (0.87%). The total number of PJI cases increased from 60 in 2010 to 162 in 2021 (R2= 0.86). Additionally, the total number of observed cases of resistant organisms increased from 30 in 2010 to 41 in 2021(R2= 0.47). The percentage of PJI caused by a resistant organism, however, was not statistically different over the decade observed 50.0% in 2010 as to 25.3% in 2021 (R2= 0.04).

DISCUSSION AND CONCLUSION:

For the years queried, we did not observe an increase in the percentage of surgically treated PJIs caused by a resistant organism at our regional referral center. However, as the volume of PJI referrals to our center has increased over time, so has the total number of PJIs caused by drug resistant organisms.

Moving forward, it will be critical to understand the microbiological profile in PJI to optimize treatment strategies and enhance patient outcomes in large referral centers.