Effect of Antibiotic Use on Tissue Culture Results in Patients with Periprosthetic Joint Infection

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INTRODUCTION: Patients with PJI are often on antibiotics prior to surgery, and it is not well-known how long antibiotics must be discontinued to optimize culture results. The purpose of this study was to determine the impact of antibiotic exposure and timing of antibiotic discontinuation on intraoperative culture results in patients with PJI.

METHODS: We identified 926 PJIs (312 hips & 614 knees) in 832 patients that were surgically treated for their infection at a single institution between 2013-2022. All patients met 2013 Musculoskeletal Infection Society (MSIS) criteria for PJI. In total, 60% of PJIs (n=551) had antibiotic exposure within 60 days of the initial PJI surgery. Of the patients with antibiotic exposure, 44% (n=244) discontinued antibiotics at least one day prior to surgery. The association of antibiotic exposure and the duration of time following discontinuation of antibiotics with positive intraoperative culture was evaluated using logistic regression.

RESULTS:

Overall, intraoperative cultures were positive in 89% of PJI surgery. The rate of positive intraoperative culture did not differ between patients with and without prior antibiotic exposure (88% vs 89%, p=0.54). Of those with antibiotic exposure prior to surgery, the odds of positive culture were higher in patients who stopped antibiotics preoperatively (OR = 1.9, 95% confidence interval 1.1-3.4). Tissue culture positivity rates did not differ based upon the timing of antibiotic discontinuation, with positive cultures obtained in 92% for 1-2 days, 94% for 3-12 days, 94% for 13-22 days and 88% for 23-58 days.

DISCUSSION AND CONCLUSION: Utilizing contemporary culture techniques for patients with PJI, intraoperative cultures were positive for almost 90% of cases regardless of antibiotic exposure. Prolonged antibiotic-free periods did not noticeably increase rates of positive intraoperative cultures in patients with PJI.