

Extended Oral Antibiotics Increase Tetracycline Resistance in Patients who Fail Two-Stage Exchange

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INTRODUCTION:

Although recent studies have demonstrated a reduction in the rate of recurrent periprosthetic joint infection (PJI) with administration of prolonged oral antibiotics at time of stage-two reimplantation, the potential for increasing bacterial resistance remains a concern.

METHODS: We retrospectively reviewed patients from four academic medical centers who underwent two-stage exchange for PJI from 2014 to 2020. Patients were stratified based on those who had received at least two weeks of oral antibiotics at the time of stage-two reimplantation compared to those who did not receive oral antibiotics. The primary outcomes were the rates of antibiotic resistance to four classes of antibiotics in any subsequent PJI (oral beta-lactams, antifolates, tetracyclines, clindamycin). The secondary outcome was the overall rate of recurrent PJI in the two groups.

RESULTS: Of the 421 patients who underwent two-stage exchange for PJI, 227 patients received prolonged oral antibiotics at the time of stage-two reimplantation. Baseline characteristics were similar between patients who received prolonged antibiotics compared to those who did not. Fifty-five patients had a recurrent PJI (13%). The prevalence of tetracycline resistance among the recurrent infections was 62% in the group that had received extended oral antibiotics compared to 27.6% in the group that did not ($p=0.04$). The prevalence of resistance to other classes of antibiotics was not significantly different between the two groups. Recurrent PJI was diagnosed in 28 out of 227 (12%) patients who received oral antibiotics compared to 27 out of 194 (14%) patients who did not receive antibiotics ($p=0.63$).

DISCUSSION AND CONCLUSION:

Prolonged oral antibiotics following two-stage exchange increases tetracycline resistance in subsequent PJI. We did not find a reduced incidence of recurrent PJI in the group who received prolonged oral antibiotics. We recommend further research in the area to refine antimicrobial protocols while considering the risks and benefits of prolonged antibiotic treatment.