Single shot or not? Early infection rates under single-dose versus 24-hour antibiotic prophylaxis in primary hip arthroplasty

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INTRODUCTION:
The optimal duration of antibiotic prophylaxis in primary arthroplasty remains debated. Recent guidelines support a single-dose approach over a 24-hour regimen, but its efficacy in arthroplasty is uncertain. We performed a non-inferiority analysis to compare early infection rates between single-dose and 24-hour prophylaxis, aiming to demonstrate equivalence while reducing costs, workload, and antibiotic exposure.
METHODS: In this single-center, retrospective before–after interventional study, we compared all primary total hip arthroplasties (THA) under 24-hour protocol in 2023 (n=1571) with single-dose in 2024 (n=1483). Revisions were excluded. Recorded variables included early infections (≤ 90 days), age, sex, Body Mass Index (BMI), American Society of Anesthesiologists (ASA) score, central venous catheter (CVC), anesthesia type, and surgical time (ST). Descriptive statistics, uni- and multivariate logistic regression analyses were performed.
RESULTS: Demographics and procedural variables were similar between periods. Early infection rates did not differ significantly: 0.6 % (10/1571) vs. 0.9 % (13/1483; p = 0.445). Age (70.4 ± 9.7 vs. 68.9 ± 9.9 years), BMI (28.8 ± 5.2 vs. 29.1 ± 5.5 kg/m²), and ST (64.5 ± 18.5 vs. 66.6 ± 19.0 min) were comparable. In univariate analysis, infection risk between periods was not significant (OR = 1.38, CI [47,8-392.1], p = 0.445). In multivariate models, CVC (OR = 136.9; 95% CI [47.8-392.1], p < 0.001) and anesthesia type (OR = 2,69, 95% CI [1,08-6,73], p = 0.034) were significantly associated with infection risk; the prophylaxis regimen and all other factors showed no significant associations (p ≥ 0.123).
DISCUSSION AND CONCLUSION: Single-dose prophylaxis is non-inferior to a 24-hour regimen for preventing early infections in THA. Anesthesia type and CVC were significant risk factors. Whether CVC is a direct risk factor or a marker of underlying health remains unclear. Implementing a single-dose protocol can reduce cost, workload and antibiotic exposure without compromising patient safety.