

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

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INTRODUCTION: The optimal duration of antibiotic prophylaxis in primary arthroplasty is still subject to debate. Recent recommendations advocate a single-shot approach instead of a 24-hour regimen, but its efficacy in arthroplasty remains uncertain. We performed a non-inferiority analysis to compare early infection rates between single-shot and 24-hour prophylaxis, aiming to demonstrate equivalence while reducing costs, staff workload and antibiotic exposure.

METHODS: In this single-center retrospective before-after interventional study, we compared all primary unicompartmental (UKA) and total knee arthroplasties (TKA) performed under a 24-hour protocol in 2023 (UKA n=527; TKA n=1337) with those under single-shot prophylaxis in 2024 (UKA n=624; TKA n=1372). Revisions were excluded. We recorded early infections (≤ 90 days), age, sex, Body Mass Index (BMI), American Society of Anesthesiologists physical status classification system (ASA), use of a central venous catheter, anesthesia type and surgical time. Descriptive statistics and uni- and multivariate logistic regression analyses were conducted.

RESULTS:

Demographics and procedural variables were similar between periods. Early infection rates did not differ significantly: UKA 0% (0/527) vs. 0,2% (1/624; $p=0,993$) and TKA 0,5% (7/1337) vs. 0,3% (4/1372; $p=0,349$). Mean \pm SD age, BMI, and surgical time were comparable (UKA: $67,2 \pm 9,2$ vs. $66,9 \pm 8,6$ years; $31,1 \pm 5,4$ vs. $30,6 \pm 5,1$ kg/m²; $58,8 \pm 14,8$ vs. $56,4 \pm 13,9$ min; TKA $70,8 \pm 8,9$ vs $70,2 \pm 8,9$ years; $32,0 \pm 6,1$ vs $32,1 \pm 6,3$ kg/m²; $70,2 \pm 16,5$ vs. $68,9 \pm 17,5$ min).

In multivariate models neither prophylaxis type nor any patient- or procedure related factor was significantly associated with infection risk (all $p \geq 0,123$).

DISCUSSION AND CONCLUSION: Single-shot prophylaxis is non-inferior to a 24-hour regimen in UKA and TKA, exhibiting comparable early infection rates. Adoption of a single-shot protocol may streamline workflows and reduce antibiotic exposure without compromising patient safety.