**Safety of Topical Tobramycin Powder During Operative Treatment of Fractures**

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**Purpose:** Topical tobramycin powder is increasingly used to prevent infections in fracture patients. However, there is limited evidence on the safety profile of this common prophylaxis. This study evaluated the nephrotoxic risks and systemic absorption of tobramycin powder locally administered to patients at high risk of infection.

**Methods:** This safety study was nested within the intervention arm of a large, randomized controlled trial. We included patients with a tibial pilon or plateau fracture treated with plate and screw fixation and deemed at high risk of infection according to prespecified criteria. The study participants received 1.2 g of tobramycin powder and 1 g of vancomycin powder in their wound bed at the time of definitive fixation. We assessed nephrotoxicity using the Acute Kidney Injury Network criteria, measuring serum creatinine levels before surgery and again 1 day and 14 days post-treatment. Systemic tobramycin absorption levels were measured <1 hour, 4-6 hours, and 24 hours after treatment, with 24-hour levels less than 2 mcg/mL thought to be of low concern for renal injury.

**Results:** The study enrolled 64 patients with a median age of 49 years (interquartile range [IQR], 33 to 57), and 39% were female. 9 patients (14%) had diabetes mellitus, and 2 (3%) had chronic kidney disease. Two patients (3%) experienced a ≥26.2 µmol/L increase (i.e., stage 1 acute kidney injury) in serum creatinine within a day of their surgery. However, the renal function of both patients improved to baseline at weeks. Median peak tobramycin level <1 hour after treatment was 2.5 mg/mL (IQR, 1.3 to 4.3), and all measured peak levels were within or below recommended therapeutic levels. The serum concentration 24 hours after treatment was below 2 mcg/mL in all patients.

**Conclusion:** The findings of this safety study suggest that although 1200 mg of locally administered tobramycin powder can often be detected at some level in the systemic circulation, serum levels were reassuring and there are no increased signs of long-term nephrotoxicity.