

## Inhaled Amikacin in hospital acquired pneumonia post cardiac surgeries

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**Objective:** Nebulized antibiotics offer high efficacy due to significant local concentrations and safety with minimal blood levels. This study evaluates the efficacy and nephrotoxicity of nebulized versus intravenous amikacin in post cardiothoracic surgical patients with nosocomial pneumonia caused by multi-drug resistant gram-negative bacilli.

**Design & Patients:** Prospective, randomized, controlled study on surgical patients divided into two groups. The first group was administered intravenous amikacin 20 mg/kg once daily. The second group was prescribed amikacin nebulizer 400 mg twice daily. Both groups were co-administered intravenous piperacillin/tazobactam empirically. Recruited patients were diagnosed by either hospital acquired pneumonia or ventilator associated pneumonia where 56 (42.1%) patients were diagnosed with hospital acquired pneumonia, 51 (38.34%) patients were diagnosed with early ventilator associated

pneumonia and 26 (19.54%) patients with late ventilator associated pneumonia.

**Measurements & Main Results:** Clinical cure in both groups was assessed on day 7 of treatment was the primary outcome. Efficacy was additionally evaluated through assessing the length of hospital stay, ICU stay, days on amikacin, days on mechanical ventilator, mechanical ventilator free days, days to reach clinical cure, and mortality rate. Lower nephrotoxicity in the nebulized group was observed through significant preservation of kidney function ( $p < 0.001$ ). Although both groups were comparable regarding length of hospital stay, nebulizer group showed shorter ICU stay ( $p = 0.010$ ), lower number of days to reach complete clinical cure ( $p = 0.001$ ), fewer days on mechanical ventilator ( $p = 0.035$ ), and fewer days on amikacin treatment ( $p = 0.022$ ).

**Conclusion:** Nebulized amikacin is a less nephrotoxic option which was associated with less deterioration in kidney function besides lower trough levels and more effective option which was associated with better clinical cure rates, less ICU stay, and fewer days to reach complete recovery compared to IV amikacin for surgical patients with nosocomial pneumonia.

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