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### **Inhaled colistin monotherapy for respiratory tract infections in adults without cystic fibrosis: a meta-analysis**

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**Background:** Inhaled colistin is becoming increasingly popular against respiratory tract infections due to multidrug resistant (MDR) Gram-negative bacteria since it may overcome the problems associated with IV administration. We evaluated the effectiveness and safety of inhaled colistin as monotherapy (without concomitant intravenous administration of colistin) in the treatment of respiratory tract infections due to MDR or colistin only susceptible Gram-negative bacteria.

**Material/methods:** A meta-analysis was conducted. PubMed and Scopus databases were searched until October 2016. Inhaled colistin could be used either only as monotherapy (no other antibiotic was administered) or as adjunctive treatment to other intravenous (IV) antibiotics (active or inactive to the isolated pathogen) except for colistin. Patients receiving IV colistin in addition to inhaled colistin were excluded from the analysis.

**Results:** Twelve studies (373 patients receiving inhaled colistin for respiratory tract infection) were included. Two randomized trials were identified. Ten studies studied patients with pneumonia (including 8 with ventilator-associated pneumonia) and 2 with ventilator-associated tracheobronchitis. Patients with infections due to MDR *Acinetobacter baumannii* and *Pseudomonas aeruginosa* were mainly studied. Daily dose of inhaled colistin (1.25-15 million IU) and treatment duration (mean 7 to 17.5 days) varied in the individual studies. In 5 studies colistin was the only active agent against the causative pathogen of the respiratory infection; additional inactive antibiotics against the causative pathogens might have been administered. Additional antibiotics active against the causative pathogen were used in the remaining 7 studies. The pooled all-cause mortality was 33.8% (95% CI 24.6% – 43.6%, figure 1). Clinical success was 70.4% (58.5% – 81.1%); excluding the two studies with VAT, the pooled clinical success was 65.9% (53.3% - 77.5%). Eradication of Gram-negative bacteria was shown in 71.3% (57.6% – 83.2%) of cases.

**Conclusions:** Inhaled colistin monotherapy may deserve further consideration as a mode for colistin administration for the treatment of patients with respiratory tract infections due to MDR *A. baumannii* and *P. aeruginosa*.

**Figure 1. Pooled analysis of mortality among patients treated with inhaled colistin. (Squares = proportion in each study; Horizontal lines = 95% CI; Diamonds = pooled proportion for all studies).**

