Respiratory infections

Inhalation of aztreonam for treatment of lung infection in cystic fibrosis and bronchiectasis

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In the last decades inhalation of antibiotics mainly tobramycin (liquid and powder) received an important role for treatment of cystic fibrosis and non-cystic fibrosis bronchiectasis which was followed by a strong increase in life expectancy and quality of life in these patients. Due to potential bacterial resistance and side effects even after inhalation other inhalative antibiotic therapies (e. g. aztreonam and colistin/colistimethate) were developed or are in preclinical studies. Aztreonam is inhibitory at low concentrations against Enterobacteriaceae (except Enterobacter species) and is active against Pseudomonas aeruginosa but inactive against Gram-positive aerobic bacteria and anaerobes. In 2010 Aztreonam lysine for inhalation (AZLI; Cayston®; powder for reconstitution prior to inhalation) was introduced in clinical treatment. In the meantime a number of studies evaluated efficacy of aztreonam inhalation. In our literature review we analysed publications on inhalation of aztreonam focusing on recent publications. Most publications were found for inhalation of aztreonam for treatment of cystic fibrosis patients and only few studies for treatment of non-cystic fibrosis bronchiectasis. Targets of therapy were typically infections or exacerbations caused by Pseudomonas aeruginosa which is the most relevant strain for progressive lung destruction in these patients. In summary, studies demonstrate that inhaled aztreonam is effective and well tolerated in patients with cystic fibrosis and non-cystic fibrosis bronchiectasis. In addition, long-time studies indicated that this therapy is safe and superior to tobramycin in these patients. Furthermore, in future beyond Pseudomonas aeruginosa even other bacterial strains which are relevant in cystic fibrosis patients (e. g. Burkholderia species, Stenotrophomonas maltophilia and Bordetella bronchiseptica) may serve as a potential target of inhalative aztreonam administration. However, also even other clinical indications with bacterial strains susceptible for aztreonam, e. g. Pseudomonas infections in patients with ventilator associated pneumonia (VAP) may serve as future study goals.