

A retrospective study to evaluate the use of nebulised meropenem at a large UK adult CF centre

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Background

- Cystic Fibrosis (CF) is the most common life-threatening inherited disease in Caucasians, affecting more than 9000 people in the UK [1].
- It is caused by dysfunction of the CF transmembrane conductance regulator (CFTR), an epithelial chloride channel essential for normal fluid movement across epithelial surfaces.
- The resultant thickened airway secretions result in chronic bacterial airway infection and progressive lung damage, with median life expectancy of 41 years [1].
- Pseudomonas aeruginosa is the most common bacterial pathogen affecting adults with CF, being associated with increased morbidity and more rapid decline in lung function.
- Meropenem is commonly used intravenously in CF patients infected with P. aeruginosa, but there is limited evidence of its tolerability and effectiveness when used as a nebulised treatment.

Aim

To evaluate the use of nebulised meropenem in our large UK adult CF centre

Methods

Medical records of CF patients who trialled nebulised meropenem between 2008-2012 were reviewed for: demographics, lung function, BMI, sputum microbiology, indications and tolerability and also number of exacerbations requiring intravenous (IV) antibiotics.

Results

Demographics

- 37 patients (18 male) trialled nebulised meropenem
- Median age (IQR), 27 (20-37) years
- Median FEV1% predicted (IQR), 48 (35-64)%
- Median BMI (IQR), 23.1 (21.4-24.1) kg/m²
- All patients were chronically infected with P. aeruginosa

Administration

- Patients received a 250 mg dose, reconstituted with 4ml water for injection, twice daily preceded by a bronchodilator

Indications

- Deteriorating condition or intolerance to other antibiotic nebulisers (21/37)
- Treatment of Burkholderia cepacia complex (BCC) (8/37)
- Treatment of non-tuberculous mycobacteria (8/37)

Tolerability

- 22/37 continue to tolerate nebulised meropenem.
- 10 of these 22 had previously been intolerant to Tobramycin Inhalation Solution (TIS) and 1 intolerant to nebulised amikacin.
- 4/37 discontinued due to no benefit or poor concordance
- 11/37 did not tolerate nebulised meropenem, reporting adverse effects including chest tightness, increased cough, chest discomfort, nausea and lethargy. 6 of these 11 had previously been intolerant to TIS and 2 were intolerant to amikacin.

Outcomes

- There were no significant changes in lung function, BMI or requirement for IV antibiotics comparing the 12-month period before and after commencing nebulised meropenem.
- However, CF patients with BCC appeared to benefit most in terms of courses of IV antibiotics and days in hospital compared to patients with other sputum microbiology (see Table 1).

	No of courses of IV 12/12 pre	No of courses of IVs 12/12 post	Days in hosp 12/12 pre	Days in hosp 12/12 post
M. Abscessus	7	10	43	44
B. Cepacia	8	5	43	11
Other	23	25	211	293

Table 1. Courses of intravenous antibiotics and days in hospital pre and post-nebulised meropenem

Conclusion

Nebulised meropenem is generally well tolerated in CF adults and offers an alternative antibiotic choice for people with CF unable to tolerate other treatments.

References

1. Cystic Fibrosis Trust Registry Report 2010.