The use of OPAT in patients with non-cystic fibrosis bronchiectasis: key findings from a retrospective and prospective audit.

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Introduction

Non-cystic fibrosis Bronchiectasis incidence and prevalence has risen over the last decade. Severe, recurrent or resistant infection in bronchiectasis may necessitate intravenous antimicrobials. Outpatient parenteral antimicrobial therapy (OPAT) is a formal method of providing intravenous antibiotics outside of the inpatient setting, associated with high patient satisfaction and cost saving. It is unclear whether the use of OPAT in bronchiectasis provides a long-term reduction in admissions.

Aims:

We aimed to establish:

- Any change in unplanned all-cause inpatient admissions after OPAT (primary aim).
- Adverse events experienced by the OPAT bronchiectasis population.
- Microbiological and antimicrobial resistance profile of sputa isolates.
- Prospective changes in healthcare related quality of life (HRQoL) scores after OPAT.

Methods

OPAT data base in Wythenshawe hospital, Manchester retrospectively searched

Patients with non-CF bronchiectasis diagnosis between July 2015-June 2017 included.

Patients previously receiving outpatients IV antimicrobials excluded.

Collection of data generated through clinical practice.

Prospective study between April and August 2018, using the St George's respiratory questionnaire (SGRQ) at initial OPAT appointment and 2 weeks after antimicrobial course.

Population Characteristics

In 2 years, 73 patients started OPAT for bronchiectasis, 87% had a CT confirmed diagnosis, mean age was 64.6 years, 61.6% were women. *Pseudomonas aeruginosa* was cultured in 60% of patients in the year before OPAT., additional organisms are described in table 1. The most frequently used antimicrobial treatment was ceftazidime with tobramycin.

Table 1. Organisms cultured before OPAT

Organism	Percentage of population culturing organism (n=73)
Pseudomonas aeruginosa	60.3%
Haemophillus influenzae	16.4%
Staphylococcus aureus	15.1%
Aspergillus fumigatus	12.3%
Candida albicans	6.8%
Serratia marcesans	6.8%
Moraxella catarrhalis	5.5%
Escherichia coli	5.5%
Stenotrophomonas maltophila	5.5%

*some patients had multiple organisms recorded, so sum of percentages exceeds 100%

Results

The mean number of all-cause inpatient admissions per year before OPAT was 1.18 (95% CI 0.78 - 1.57) and 1.12 after OPAT (95% CI 0.79 - 1.46). The mean difference was 0.053, which was not significant (p=0.738).

In the year after OPAT, 4/73 patients (5.5%) died, 5/73 patients (6.8%) suffered from an intravenous access complication. No patients suffered *Clostridium difficile* infection.

From a median of 3 cultures in 1 year post-OPAT 21/44 patients (47.7%) remained culture negative for *P. aeruginosa.* In the year after OPAT, 11 patients (25%) isolated *Pseudomonas spp* resistant to an antimicrobial used during OPAT. Patterns of resistance are described in table 2.

In the prospective study, the SGRQ was completed by 8 patients before and after OPAT. 7 patients (87.5%) had a reduction in SGRQ score greater than the clinically significant difference of 4 points. The mean reduction in SGRQ score after OPAT was 13.13 points (95% CI 3.27-22.98), p=0.016.

Table 2. New resistance in P. aeruginosa isolates to OPAT antimicrobials, in the year after OPAT.

Antimicrobial	Number of patients with newly resistant isolates	Patients developing resistance who had received the antimicrobial via OPAT
Piperacillin/ tazobactam	7	1
Meropenem	4	0
Ceftazidime	4	All
Tobramycin	3	All

Conclusion

- No significant benefit in admission reduction could be found in the year after OPAT.
- Use of OPAT has shown sustained *P. aeruginosa* suppression rates of close to 50%.
- Though significant numbers of resistant organisms are cultured after OPAT, the resistance is infrequently to the antimicrobial used in OPAT, so is unlikely to represent in vivo resistance developing.
- The significant decrease in SGRQ may be indicative of a clinical benefit of OPAT in non-CF bronchiectasis. The sample size was too small to stratify by microbiology, antimicrobials used or demographics. We are collecting data on a larger population to enable this.

Acknowledgements

This project was supervised and guided by Dr EG Muldoon at the Univserity of Manchester, Dr C Kosmidis at Wythenshawe hospital, with operational input by Sr L Wilson, and prosepective data collection by Sr R Gomez-Salinias.

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