Outpatient Parenteral Antimicrobial Therapy (OPAT) for Mycobacterial infections in the Republic of Ireland from 2013 - 2021

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Background

- Mycobacterial infections represent some of the most complex and difficult to treat diseases observed in humans and are refractory to many conventional antimicrobials [1]. Tuberculosis, when multidrug resistant (MDR) and extensively drug resistant (XDR), is frequently managed with the addition of an injectable antimicrobial. Non-tuberculosis mycobacteria (NTM) are infections of varying virulence and can also require injectable antimicrobials for significant duration [2].
- Since its initiation in 2013 the national OPAT programme has facilitated the outpatient management of intravenous antimicrobials for mycobacterial infections. It is a safe, cost-effective and patient-centred programme that enables treatment at home for patients who no longer require inpatient care, thus saving hospital bed-days [3].
- This study aims to describe the clinical epidemiology of patients on OPAT for mycobacterial infection between the years 2013 and 2021.

Methods and Materials

- A retrospective analysis of patients discharged on OPAT between 1/1/2013 to 31/8/2021 was performed using data available from the national OPAT portal, a database to which all patients are enrolled. Variables including patient demographics, diagnosis, antimicrobial agent(s) used, duration of therapy and method of OPAT delivery were collected. This study focused on patients with a mycobacterial infection, which was analysed according to NTM and *Mycobacterium tuberculosis*.
- The data were anonymised and analysed using STATA/SE version 17.0. A two-sample t-test was used to compare means and a chi-squared (χ^2) examined the relationship between categorical variables.

	NTM	TB	Total
Amikacin	13	65	78
Tigecycline	13	0	13
Cefoxitin	11	0	11
Meropenem	2	1	3
Ceftriaxone	0	3	3
Imipenem	2	0	2
Cilastatin	2	0	2
Ceftaroline fosamil	2	0	2
Piperacillin-tazobactam	1	0	1

Table 1. Antimicrobials used for mycobacterial infection on OPAT

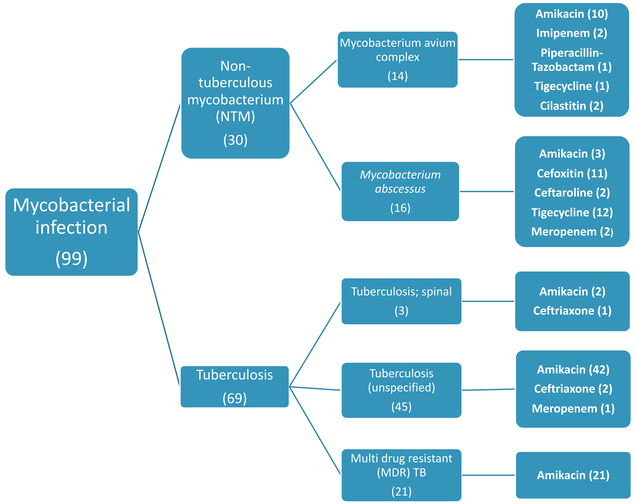

Chart 1. Differentiation of mycobacterial infections and their antimicrobials on OPAT, as per OPAT portal

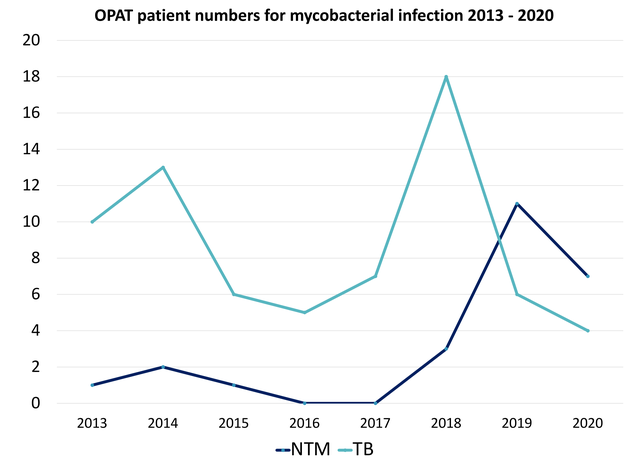

Chart 2. Trend graph demonstrating the increasing utility of OPAT for mycobacterial infection since 2013

Results

- From 1/1/2013 until 31/8/2021 there were 14,749 patients managed through the national OPAT programme, 0.67% (99/14749) of which were mycobacterial infections. NTM accounted for 30/99 (30%) while 69/99 (70%) were *M. tuberculosis* (TB) infections.
- The mean age was 38.4 years (SD 12.4 years, 95% confidence interval (CI) 36 – 41 years). While 56/99 (57%) were H-OPAT (healthcare-administered), 43/99 (43%) were S-OPAT (self-administered).
- The majority of those with NTM (23/30; 77%) were managed using S-OPAT compared with less than one third (20/69; 29%) of those with TB (p <0.001). Patients with NTM on S-OPAT were statistically younger than those on H-OPAT (35 years versus 48 years, p<0.0001 95% CI 35– 41 years).
- The median duration on OPAT was 42 days across both NTM and TB (IQR 24-73 days and 21-44 days, respectively). Two intravenous antimicrobials were used in 16/99 (16%). Amikacin was the most common antimicrobial prescribed (78/99; 79%) followed by tigecycline (12/99; 12%). A total of 3,378 hospital bed days were saved.

Discussion

- Our data show that OPAT is implemented most commonly for TB disease, though important advancements in TB research which support the use of injection-free, oral regimens, coupled with the dramatic rise in patients being treated for NTM, are likely to change this paradigm [4, 5]. While a drop in recruitment to the programme was noted with the advent of the COVID-19 pandemic (see; chart 1), previous trend saw a steady rise.
- Given the significant duration of therapy required in these infections, facilitating therapy at home, where appropriate, is in the interest of both the patient and the hospital. Our data demonstrate that current practice favours the use of H-OPAT delivery in TB disease and S-OPAT among those with NTM, perhaps reflective of the need for directly observed therapy for drug resistant TB.
- The national OPAT programme can be used to facilitate a discharge, or admission avoidance, in those requiring intravenous therapy for complex mycobacterial infections.

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