Pulmonary Mycobacterium Szulgai Infection

Abstract:
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Abstract
There has been an increase in the number of pulmonary infections caused by non-tuberculous mycobacteria (NTM) in the non-HIV-infected population with a heightened awareness clinically and in the laboratory of the significance of these respiratory isolates and newer identification techniques. As far as we are aware, this is the first case report of pulmonary Mycobacterium szulgai infection in Ireland

Case Report
A 61-year-old male smoker presented with chronic cough productive of light green sputum and dyspnoea on moderate exertion. There was no history of haemoptysis or weight loss and no known exposure to tuberculosis. Bronchial breathing was noted over the left apex and a chest X-ray revealed abscess formation in the left apex that had not been present on a chest X-ray ten years previously. CT Thorax showed bi-apical bullous emphysema with a 1.8cm left upper lobe abscess and a 1.8cm right upper lobe abscess. There was no history of hilar lymphadenopathy. Bronchoscopy did not demonstrate any endobronchial lesion or mucosal abnormality. Left and right upper lobe bronchoalveolar lavage was performed. A CT guided biopsy of the left upper lobe lesion was performed and did not reveal any evidence of malignant cells.

Figure 1: Initial CT of Thorax on presentation. Bi-apical bullous emphysema with a 1.8cm left upper lobe cavity with an associated soft tissue mass

Six sputum samples were positive for acid-fast bacilli (AFB). Culture confirmed these to be a mycobacterium species. No other significant respiratory pathogens were repeatedly isolated. Isolates were identified as Mycobacterium szulgai by the Mycobacterium Reference Unit using the commercial reverse hybridisation assay (GenoTypefi Mycobacterium CM/AS), sensitive to rifampicin, clarithromycin and ethambutol, with which the patient was treated for a total of eighteen months. The repeated isolation and definitive identification confirmed suspicions that this was a significant pulmonary NTM pathogen. The patient satisfied both the clinical (pulmonary symptoms and cavitation on imaging) and microbiological (isolated repeated isolation from sputa and bronchial washing) ATS criteria for significant NTM infection with appropriate exclusion of malignancy and other pathogens that could have also caused this clinical picture CT thorax one year later showed interval improvement in cavity wall thickening (Figure 2), sputa are negative for mycobacterial culture and the patient reports an improvement in symptoms.

Figure 2: Follow up high resolution CT, four months into treatment showing marked improvement.

Discussion
NTM are frequently regarded as being of low pathogenicity. The mean incidence of NTM infection in the southwest of Ireland was estimated by Kennedy et al to be 0.4/100,000 population, mirroring the global upward trend

Isolates found that isolation was clinically relevant in 76% of twenty-one patients studied

In their study

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M. szulgai grows slowly and produces smooth or rough pigmented colonies after 2-4 weeks. The revised by a more comprehensive classification scheme using 16S ribosomal ribonucleic acid (16S rRNA) sequencing to divide the slow and rapidly growing mycobacteria into clades. Results of sequencing of isolates can be compared with those of publicly available databases for isolates that cannot be identified by commercial nuclear acid probes

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Sequencing based methods use several target genes including 16S rRNA, heat shock protein and nrdB and novel techniques such as restriction fragment length polymorphism of the heat shock 65 protein or 16 S-23S rDNA intergenic spacer region, pyrosequencing and microchip array are in development

Pulmonary infections clinically similar to those caused by M. tuberculosis are the most common presentation, with cough, fever, night sweats and weight loss

A study by van Ingen et al on the clinical relevance of M. szulgai isolates found that isolation was clinically relevant in 76% of isolates. Thin walled cavities within apical infiltrates are considered to be common. The small number of previous case reports in the English language literature mainly describes pulmonary infection in middle aged males with pre-existing lung disease as we could ascertain, this is the first reported case of pulmonary M. szulgai infection in Ireland. Extra-pulmonary infection due to M. szulgai includes cases of tenosynovitis of the hand, olecranon bursitis, osteomyelitis, keratitis, cervical lymphadenitis, and renal or cutaneous infection

Disseminated infection has been reported in immuno-compromised patients

As with most NTM infections there is no evidence of human-to-human transmission of M. szulgai

In summary, this case illustrates both the clinical importance of detection of more rarely isolated NTM and the importance of laboratory characterisation of NTM strains. With advances in molecular identification techniques, it is likely that more cases will be identified in the future in routine clinical laboratories. It is crucial that microbiology laboratories identify these isolates and that they are not dismissed as non-pathogenic mycobacteria without appropriate clinical correlation.

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Acknowledgements
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References