

Epidemiology of pulmonary non-tuberculous mycobacterial infections: need to identify environmental sources

THE INCIDENCE of lung disease caused by non-tuberculous mycobacteria (NTM) is increasing worldwide.¹ NTM are ubiquitous organisms frequently isolated from environmental sources, including water and soil;² isolation of NTM species from a respiratory sample is therefore insufficient evidence for the presence of NTM lung disease. In addition, cases of NTM lung disease are not reported to public health authorities in many countries, and formal epidemiological and surveillance data, particularly population-based data, are not readily available.

In this issue of the *Journal*, Jankovic et al. report on a nationwide population-based study in Croatia from 2006 to 2010, in which all NTM clinical isolates were sent to the National Reference Laboratory for accurate identification.³ This is the first in-depth study of NTM epidemiology in Croatia to provide data on both the incidence and prevalence of NTM infections. These data show a rapid decrease in the number of *Mycobacterium tuberculosis* isolates (from 3717 in 2006 to 2283 in 2010), while the number of NTM isolates increased steadily (from 235 in 2006 to 416 in 2010).

The most clinically relevant NTM species identified in this study were *M. xenopi* and *M. avium* complex. The distribution of NTM species isolated from respiratory samples differs significantly among countries;⁴ the isolation of *M. xenopi* is limited to distinct geographical regions, primarily in Europe (Hungary, Croatia, Belgium and France) and eastern Canada.⁴ Interestingly, the estimated annual incidence of probable NTM lung disease was higher in the urbanised coastal region (0.35/100 000) than in the rural continental region (0.17/100 000) of Croatia. These data suggest that differences in NTM species distribution and the incidence of NTM lung disease may be a result of differential exposure to NTM through municipal and rural water supplies.

In the absence of clinical and radiographic data, the authors defined 'possible' NTM lung disease as two positive sputum specimens or one positive bronchoalveolar lavage (BAL) or brush. 'Probable' NTM lung disease was defined as three or more positive sputum samples, or one positive BAL/brush along with one or more positive sputum samples.³ To differentiate

between colonisation of the airway and diagnosis of clinically relevant NTM lung disease, three aspects—symptomatic, radiological, and microbiological—need to be evaluated. However, obtaining complete clinical and radiological data is difficult in a population-based epidemiological study. Fortunately, microbiological criteria alone are highly predictive (86%) of true NTM lung disease.⁵ Therefore, most patients with 'possible' and 'probable' NTM lung disease in the study by Jankovic et al. could reasonably be assumed to have actual disease. These results suggest that microbiological diagnostic criteria alone may be useful for laboratory-based NTM disease surveillance.

The environmental reservoirs and behavioural risk factors associated with NTM lung disease are not well understood. More epidemiological research is necessary to identify specific environmental reservoirs for the various NTM species, which may help prevent transmission to susceptible individuals.

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