Those other mycobacteria

The finding of acid-fast bacilli in a sputum specimen rightly raises concern for pulmonary tuberculosis. The reality is that most positive smears will grow atypical or nontuberculous mycobacteria (NTM), ubiquitous environmental organisms that are relatively reluctant pathogens. The original classifications by Runion depended on growth rate, pigment formation, and reaction to exposure to light. Over 125 species have been described. In British Columbia *M. avium complex* (MAC) is the most frequently isolated organism. Other isolates include, *M. kansasii*, *M. fortuitum*, *M. abscessus* and *M. marinum*, which affects only the skin. The organisms can be isolated from the soil and water sources such as shower heads, making exposure unavoidable. Reports from several countries (including Canada) suggest the incidence of pulmonary disease due to NTM appears to be rising, but the disease is not reportable so data are difficult to obtain. Although the cause has not been determined, possible explanations include improved laboratory isolation techniques, an increasingly aging population, and an increase in high-resolution CT imaging. The increased societal preference for showering has also been suggested as it leads to aerosolization of the NTM. There are interesting differences in the organisms isolated depending on geographic location. For example, *M. malmoense* is very common in the United Kingdom and northern Europe but extremely rare in Canada, while *M. xenopi* is common in Europe and in southern Ontario. In addition to pulmonary disease, other disease can be caused by these organisms including lymphadenitis, cutaneous disease, and in the immunocompromised, disseminated disease. Unlike with tuberculosis, the isolation of these organisms does not define a clinical case of disease and thus the term "colonizer" is used to denote an isolate with no demonstrable clinical consequence.

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The diagnosis of NTM pulmonary disease requires the careful collation of clinical, radiological, and bacteriological data. The clinical presentation can be very similar to tuberculosis with cough, fever, hemoptysis, and weight loss. Initially the disease was described in older men with underlying lung disease but is now increasingly found in older women. Common radiological findings of MAC disease, particularly in elderly females, are multifocal bronchiectasis, quite frequently affecting both the lingula and the middle lobe in conjunction with multiple pulmonary nodules, "tree-in-bud" abnormalities, and occasional cavitation. Usually patients with disease have multiple positive cultures over a period of time. Upper lobe fibrocavitary disease is more common in those with underlying lung diseases such as COPD.

The identification of an atypical organism can be made rapidly using DNA probes that distinguish positive smears from *M. tuberculosis*. This is important from a public health perspective as NMT cases do not require isolation. The course is highly variable, with some patients having fairly aggressive disease and others an indolent course with little change over many years. Unfortunately, we have no way of predicting which patient will be in either category. It has not been established that treating all isolates early prevents progression of disease. Unlike tuberculosis, the response of pulmonary MAC to treatment is extremely variable. Even with first-line treatment, only approximately 50% respond. Recurrence is also common, as the underlying lung susceptibility remains even though the organism may be temporarily cleared. The decision to place the patient on treatment is, at times, difficult, and obviously the benefits have to outweigh the risks. Treatment for MAC consists of three antibiotics, notably rifampin, ethambutol, and a macrolide generally for at least 12 months. Unfortunately, linkages between drug susceptibility and clinical outcomes are widely varied, with many studies showing no correlation. Tolerability is also an issue. The drugs can be given three times weekly rather than daily, particularly in those with noncavitary disease. Occasional surgery is required in those with localized pulmonary disease, or nonresolving cavitation may be indicated. This requires careful specialist assessment as many of these patients are poor operative risks. Pulmonary disease caused by NTM other than MAC require different regimens and specialist advice is preferable. Much needs to be learned about the treatment of these organisms and hopefully their rising incidence will trigger appropriate research, which to date has not been a priority. Our patients deserve more.

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