Absence of Atypical Pathogens in Pleural Infection

To the Editor:

“Atypical” pneumonia organisms (i.e., Legionella pneumophila, Mycoplasma pneumoniae, Chlamydia pneumoniae, Chlamydia psittaci, and Coxiella burnetii) frequently cause community-acquired pneumonia, but their role in pleural infection is unknown because they are not detected by standard pleural fluid culture. Such knowledge could have relevance to empirical antibiotic choices and routine microbiology culture protocols.

Nucleic acid amplification testing (NAAT) of the 16S ribosomal RNA gene allows atypical detection with high sensitivity and specificity. Therefore, we undertook a 16S NAAT-based study to estimate the prevalence of atypical pathogens in pleural infection, either as a sole pathogen or in polymicrobial infection.

Pleural fluid from 374 patients with pleural infection (89% community acquired) from 52 centers in the United Kingdom, collected as part of two randomized controlled trials between 1999 and 2008, were analyzed. Further experimental details are found in e-Appendix 1. Nested polymerase chain reactions, initially targeting conserved regions of the 16S gene, common to all bacteria, and subsequently targeting genus-specific sequences, were used to detect atypical organisms. 16S sequencing was used to confirm species identity for any positive reactions.

Of the 374 samples tested, only two samples were positive using Mycoplasma species primers. Sequencing confirmed Mycoplasma salivarium in one and M salivarium/arthritis in the other. M salivarium has been isolated in the oropharynx, particularly within the gingival crevices, and may play a role in periodontal disease. Its DNA has been isolated in synovial fluid of patients with arthritis, and has also been found in polymicrobial brain abscesses.

M arthritis has not been demonstrated to cause human disease and seems unlikely to be the implicated pathogen in the second case. There were two weak false-positive results using Coxiella species primers. No samples were positive for Legionella species or Chlamydia species.

To our knowledge, this study presents the first systematic assessment for atypical pathogens by using highly sensitive NAAT in a patient group with pleural infection representative of routine clinical practice. In contrast to the 20% to 40% of cases of pneumonia caused by atypical pathogens, we found that atypical pathogens cause pleural infection very infrequently, lending further weight to the hypothesis that the bacteriology of pleural infection differs from that of pneumonia. There is no evidence that atypical coverage is required in the empirical antibiotics chosen for pleural infection. Furthermore, there is no requirement for specialist atypical culture during routine pleural fluid analysis.

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Additional information: The e-Appendix can be found in the Supplemental Materials section of the online article.
References


