Debugging: Is Routine Antimicrobial Prophylaxis Indicated in Medical Thoracoscopy?

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Endoscopic pleuroscopy has evolved over more than a century from a procedure using a modified cystoscope with a candle for a light source, to the technologically advanced video-assisted thoracic surgery (VATS) [1]. While the “father of thoracoscopy,” a Swedish internist named Hans Christian Jacobaeus, primarily used the technique for intrapleural pneumolysis in tuberculosis patients, he also advocated its use for diagnostic purposes in a range of both pleural and parenchymal disorders [1, 2]. His vision proved true, and today after numerous innovations in instrumentation, thoroscopic techniques are invaluable to both thoracic surgeons and pulmonary physicians.

Surgical or open thoracotomy is accompanied by an inherent risk of postoperative infection – in the form of an empyema, pneumonia, or a surgical site infection (SSI) [3]. Surgical society guidelines appear reasonably well-supported by the literature in their recommendations that antimicrobial prophylaxis be administered in open thoracic procedures [3]. The overall rate of infection associated with thoracic surgery is quoted as 0.76–2.04%, with rates of pneumonia from 3 to 24%, and empyema from 0 to 7%, when antimicrobial prophylaxis is administered [3]. The rate of SSI may be as high as 14% without antimicrobial prophylaxis and drops to 0.42–4.0% when prophylaxis is administered [3].

The rate of SSI with VATS, which is less invasive than open thoracic surgery, is lower, ranging from 1.7 to 5.5%, and for medical thoracoscopy it is even lower [4, 5]. Empyema occurs in 1.9–2.7% and SSI around 3% of cases following medical thoracoscopy without antimicrobial prophylaxis [6–9].

Whereas the strength of evidence for antimicrobial prophylaxis in open thoracic surgery patients is good (level A), this could not be further from the truth for thoracoscopy. Some evidence shows that antimicrobial prophylaxis is not indicated for intercostal drain insertion unless in the setting of trauma [10]. With a paucity of high-quality evidence, there is significant heterogeneity of practice worldwide with regard to antimicrobial prophylaxis for medical thoracoscopy. Even current guidelines, which reasonably recommend routine prophylaxis only in patients with risk factors such as asplenia, prosthetic heart valves, and previous endocarditis, preface their recommendations with the note that their document is drafted solely on the basis of expert opinion [11].

Considering the population of patients who are likely to undergo such a procedure – patients with malignancy, immunocompromised, who have had repeated pleural aspirations or even biopsies – it seems reasonable to hypothesise that the risk of post-procedural infection would

be high. The sterile pleural space may have been repeatedly compromised, and adhesions or anatomical abnormalities of the pleura itself may provide a potentially microbe-friendly environment.

It is also clear that in the current climate of rapidly emerging highly resistant microbes, every physician has a duty to enforce strict antibiotic stewardship, making evidence-based decisions and justifying every dose of antimicrobial agent prescribed. The question of prophylactic use of antimicrobials becomes even more important and controversial in this light; and it must be answered.

In the present edition of *Respiration*, Dhooria and colleagues have made admirable inroads into gathering the evidence that we need [12]. They recruited patients who underwent diagnostic medical thoracoscopy without recent exposure to antimicrobials, randomised them to a single dose of 2 g intravenous cefazolin (a choice based on a surgical guideline) or placebo infusion prior to thoracoscopy, and analysed whether there was a significant difference in the rate of empyema or SSI between the groups. This, they did not find.

The overall incidence of infectious complications among their 100 participants was 10%, which seems high

until one considers that many of their procedures were prolonged by the presence of dense pleural adhesions. A rate of 6% for empyema and 4% for SSI is higher than previously reported rates for medical thoracoscopy, but this remains comparable to the rates obtained for VATS, and far lower than the infection rates of open thoracic surgery without antimicrobial prophylaxis [4, 6].

The baseline characteristics and risk factors for infection, such as diabetes and chronic kidney disease, did not differ between the groups, and specifically were not different between patients who developed infection and those who did not [12]. Two deaths occurred in the study and appear to have been unrelated to infection.

Whilst the numbers in the study were small, it remains to the best of our knowledge the only prospective study to address this particular question. Moreover, at the very least, it clarifies the fact that the surgical guidelines regarding antimicrobial prophylaxis simply cannot be considered “coverall” guidelines for every thoracic procedure. Clearly, only large prospective multicentre studies will ultimately assist us in debugging the issues around antimicrobial prophylaxis and medical thoracoscopy.

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