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INVITED COMMENTARY

Re: Should We Use Routinely Prophylactic Antibiotics in Patients with Chest Trauma?

Antibiotic prophylaxis may be able to prevent post-traumatic empyema and pneumonia, but how often is this necessary? The incidence of post-traumatic empyema is about 1,6–2,4% according to large observational studies[1,2], which has been objected by Richardson and Carillo[3]. Another aspect for the decision to use prophylactic antibiotics may be the prognosis of the trauma. Blunt thoracic trauma has been accused to have a higher mortality rate that penetrating trauma (73% versus 22%)[4]. Again, this was not unanimously accepted[5,6].

The benefit of antibiotic prophylaxis after thoracic injury has been doubted in many observational studies[1,2,7,8,9].

In a situation like this it sounds reasonable to perform randomized controlled trials (RCT). Several RCTs which differed in study design (type of trauma, antibiotics, etc.) came up with conflicting results: eight studies were in favour of antibiotic prophylaxis[10,11,12,13,14,15,16,17] whereas three studies did not recommend routine antibiotic prophylaxis[18,19,20].

Although RCT has been considered gold standard for clinical research, there is no guarantee that the results are valid due to deficiencies in design, conduct, analysis or interpretation of results[21,22,23], or quality of reporting of RCTs[24].

Meta-analysis, which has been proposed as an important research tool for integrating the results of RCTs, may be a way to solve the problem[25].

Sanabria and colleagues (DOI: 10.1007/s00268-006-0672-6; this issue) have analyzed five RCTs of prophylactic antibiotics in chest trauma using meta-analysis and came to the conclusion that antibiotic prophylaxis decreases the frequency of post-traumatic empyema and pneumonia[26].

Two previous meta-analyses reported opposite results: Fallon and Wears[27] observed no effects of antibiotics whereas Evans[28] recommended the use of antibiotics.

Conflicting results of RCTs and meta-analysis may have different reasons: identification and assessment of trials in terms of relevance, validity, reliability and generalisability[29] or heterogeneity in conventional meta-analysis[30]. Measures for evaluation of heterogeneity were used by Sanabria *et al.*[26] For the practising surgeon the question remains: do the results apply to my patient (external validity)[31]?

The decision to use or not to use prophylactic antibiotics may be influenced by risk factors in a patient which make this patient more likely to develop a post-traumatic empyema: mechanism and extent of trauma, transfusion requirements[9,32]. Despite the above well-performed meta-analysis the decision to apply antibiotic prophylaxis will remain the task of the physician on duty. RCTs, meta-analysis are helpful but will not be able to serve as a definite and unrestricted guideline for treatment of the individual patient as multiple factors contribute to the development of posttraumatic empyema[33].

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