

Invited commentary

Should we use routinely prophylactic antibiotics in patients with chest trauma?

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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 Carillo³. 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 than penetrating trauma. Blunt thoracic 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 RCTs²⁴.

Meta-analysis, which has been proposed as an important research tool for integrating the results of RCTs, may be a way to solve the problem²⁵.

Sanabria and colleagues 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 pneumonia²⁶.

Two previous meta-analyses reported opposite results: Fallon and Wears²⁷ observed no effects of antibiotics whereas Evans²⁸ 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 generalisability²⁹ or heterogeneity in conventional meta-analysis³⁰. 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 myeloma: 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 myeloma.³³

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