

Emergency Physicians' Use of Prophylactic Antibiotics in Blunt Thoracic Trauma Patients Not Requiring Immediate Chest Drain. Protocol for an E-Survey.

Santi Di Pietro¹, Elena Regeni², Ceri Battle³, Virginia Valeria Ferretti⁴, Valeria Musella⁴, Federico Matteo Maggi¹, Johanna Walter⁵, Ilenia Mascherona⁶, Roberta Petrino⁶, Ari Palomäki⁷, Matthew J Reed⁸, Myrto Bolanaki⁹, Luis Garcia-Castrillo¹⁰, Stefano Perlini¹

¹ Emergency Medicine Unit and Emergency Medicine Postgraduate Training Program, IRCCS Policlinico San Matteo Foundation, Department of Internal Medicine, University of Pavia, Pavia, Italy

² Emergency Medicine Resident, University of Trieste, Trieste, Italy

³ Physiotherapy Department, Swansea Bay University Health Board, Swansea, UK

⁴ Unit of Clinical Epidemiology and Biostatistics, Fondazione IRCCS Policlinico S. Matteo, Pavia, Italy

⁵ Emergency Department, Victoria Hospital Kirkcaldy, Kirkcaldy, UK

⁶ Emergency Department, Ente Ospedaliero Cantonale, Canton Ticino, CH

⁷ Professor of Emergency Medicine, Faculty of Medicine and Health Technology, Tampere University, Tampere, Finland

⁸ Emergency Medicine Research Group Edinburgh (EMERGE), Royal Infirmary of Edinburgh

⁹ Department of Emergency and Acute Medicine, Campus Virchow and Mitte, Charité-Universitätsmedizin Berlin, Berlin, Germany

¹⁰ Emergency Department, Hospital Universitario Marqués de Valdecilla, Santander, Cantabria, Spain

Background

Rib fractures are the most prevalent injury following blunt thoracic trauma and are associated with significant morbidity and mortality. Among the possible complications of rib fractures, the occurrence of pneumonia – with an incidence as high as 24.5% in previous studies - can have a major impact on patient outcomes. In a large nationwide retrospective study of more than 17,000 trauma patients, the occurrence of pneumonia was significantly associated with mortality (odds ratio 3.5, 95% CI 2.2–5.7) in patients with isolated thoracic trauma, with stronger association in the elderly and in multimorbid patients. Therefore, interventions that reduce the incidence of pneumonia may reduce mortality in this patient cohort and are therefore much needed in clinical practice. Conceptually, the use of prophylactic antibiotics, i.e. an antibiotic regimen started soon after thoracic trauma to prevent occurrence of pneumonia, may be a plausible option. Nevertheless, current evidence only recommends the prophylactic use of antibiotics when chest drain insertion is required, whereas studies in blunt thoracic trauma patients not requiring immediate chest drain are lacking. Similarly, there is no evidence documenting whether emergency physicians - who manage thoracic trauma patients in the early phase after a traumatic event - tend to prescribe antibiotics in this clinical scenario.

Methods

We designed an e-survey which is intended for a convenience sample of emergency physicians practising across Europe. This protocol follows the CHERRIES checklist for reporting internet e-surveys and it was given exempt status from the “Comitato Etico Territoriale Lombardia 6”, Pavia, Italy. The e-survey consists of 3 sections: sections 1 & 3 include questions about participants' general practices and clinical background. Section 2 includes 6 clinical cases that present patients with blunt thoracic trauma and no immediate indication for chest drain. Each vignette includes randomised clinical factors which were selected based on literature review and clinical experience. Following each clinical vignette, participants will be asked how much they agree or disagree with the administration of antibiotic therapy to prevent occurrence of pneumonia/infectious complications. Each vignette is designed to investigate the potential influence of a known risk factor for respiratory complications (including pneumonia) on physicians' tendency to prescribe antibiotics. In particular, we examine the effect of the number of rib fractures,

presence and severity of lung contusion, history and severity of COPD, patient's age, use of antiplatelet or anticoagulant therapy, and smoking status.

The e-survey will be "open", i.e. accessible through a dedicated link not restricted by any password. The target population will receive a survey invitation via email. To ensure the highest number of respondents, we will send a formal invitation to participate to the European Society of Emergency Medicine (EUSEM) and to all its 37 individual national society members [<https://eusem.org/membership/national-society-membership>, accessed on March 29th 2024]. We will also send an invitation to national or regional networks of emergency medicine trainees, such as ITEMS (Italian Emergency Medicine Schools) or TERN (Trainee Emergency Research Network - UK).

The survey is anonymous, and participation is voluntary and free. Participants can decline to participate or discontinue participation at any time.

Statistics

Descriptive statistics will be used to assess participant characteristics, choice to initiate antibiotics, and case realism. Variables will be reported as absolute and relative frequencies of each category. Quantitative variables will be summarised as mean and standard deviations, or as median and interquartile ranges, according to the variable distribution. Where possible, logistic regression models will be applied to evaluate the association between responders' characteristics and their attitude to prescribing prophylactic antibiotics. Results will be reported in terms of Odds Ratios (OR) with 95% Confidence Intervals (95%CI). Two-sided type I error will be set at 0.05. All statistical analyses will be performed using Stata 18 or later versions (StataCorp. 2023. Stata Statistical Software: Release 18. College Station, TX: StataCorp LLC.) Participant responses following randomised factors will be assessed using multivariable logistic regression models.