



Resource use and clinical outcomes in blunt thoracic injury: a 10-year trauma registry comparison between southern Finland and Germany

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Abstract

Purpose Serious thoracic injuries are associated with high mortality, morbidity, and costs. We compared patient populations, treatment, and survival of serious thoracic injuries in southern Finland and Germany.

Methods Mortality, patient characteristics and treatment modalities were compared over time (2006–2015) in all patients with Abbreviated Injury Scale (AIS) thorax ≥ 3 , Injury Severity Score (ISS) > 15 , age > 15 years, blunt trauma mechanism, and treatment in Intensive Care Unit (ICU) in Level 1 hospitals included in the Helsinki Trauma Registry (HTR) and the TraumaRegister DGU[®] (TR-DGU).

Results We included 934 patients from HTR and 25 448 patients from TR-DGU. Pre-hospital differences were seen between HTR and TR-DGU; transportation in the presence of a physician in 61% vs. 97%, helicopter use in 2% vs. 42%, intubation in 31% vs. 55%, and thoracostomy in 6% vs. 10% of cases, respectively. The mean hospital length of stay (LOS) and ICU LOS was shorter in HTR vs. TR-DGU (13 vs. 25 days and 9 vs. 12 days, respectively). Our main outcome measure, standardised mortality ratio, was not statistically significantly different [1.01, 95% confidence interval (CI) 0.84–1.18; HTR and 0.97, 95% CI 0.94–1.00; TR-DGU].

Conclusions Major differences were seen in pre-hospital resources and use of pre-hospital intubation and thoracostomy. In Germany, pre-hospital intubation, tube thoracostomy, and on-scene physicians were more prevalent, while patients stayed longer in ICU and in hospital compared to Finland. Despite these differences in resources and treatment modalities, the standardised mortality of these patients was not statistically different.

Keywords Trauma registry · Thoracic · Blunt injury · Expected mortality · Standardised mortality ratio

Introduction

Blunt thoracic injuries can cause severe morbidity and mortality [1–3]. Most patients with serious thoracic injuries are treated in intensive care units (ICU) and the length of stay (LOS) in hospital is often long. These patients are a heterogeneous group with whom it is difficult to compare different

treatment options or perform randomised controlled studies [4].

A previous trauma registry comparison of severely injured patients (including all injuries in different body regions) between southern Finland and Germany [5] showed distinct differences in outcome in patients with severe traumatic brain injury. Because of this finding, another comparison was performed to determine the possible reasons for that particular difference [6]. After this analysis, it was feasible to also look closely at other injuries to determine whether differences exist in, e.g., patients with severe thoracic injuries if isolated from all other severely injured patients. This would also be a way to benchmark the treatment of patients with severe thoracic injuries in the Helsinki Trauma Registry (HTR). The study by Brinck in 2015 [5] revealed thoracic injuries to be common in both Finnish and German trauma registries; 47% of Finnish patients and 58% of German patients had at least a moderate chest injury (Abbreviated

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