The role of whole-body computed tomography in the diagnosis of thoracic injuries in severely injured patients – a retrospective multi-centre study based on the trauma registry of the German trauma society (TraumaRegister DGU®)

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Abstract

Background: Thoracic injuries are a leading cause of death in polytrauma patients. Early diagnosis and treatment are of paramount importance. Whole-body computed tomography (WBCT) has largely replaced traditional imaging techniques such as conventional radiographs and focused computed tomography (CT) as diagnostic tools in severely injured patients. It is still unclear whether WBCT has led to higher rates of diagnosis of thoracic injuries and thus to a change in outcomes.

Methods: In a retrospective study based on the trauma registry of the German Trauma Society (TraumaRegister DGU®), we analysed data from 16,545 patients who underwent treatment in 59 hospitals between 2002 and 2012 (ISS ≥ 9). The 3 years preceding and the 3 years following the introduction of WBCT as a standard imaging modality for the investigation of severely injured patients were assessed for every hospital. Accordingly, patients were assigned to either the pre-WBCT or the WBCT group. We compared the numbers of thoracic injuries and the outcomes of patients before and after the routine use of WBCT.

Results: A total of 13,564 patients (pre-WBCT: n = 5005, WBCT: n = 8559) were included. Relevant thoracic injuries were detected in 47.8%. There were no major differences between the patient groups in injury severity (pre-WBCT: median ISS 21; WBCT: median ISS 22), injury patterns and demographics. After the introduction of WBCT, only minor changes were observed regarding the rates of most thoracic injuries. Clinically relevant injuries were pulmonary contusions (pre-WBCT: 18.5%; WBCT: 28.7%), injuries to the lung parenchyma (pre-WBCT: 12.6%; WBCT: 5.9%), multiple rib fractures (pre-WBCT: 10.6%; WBCT: 21.6%), and pneumothoraces (pre-WBCT: 17.3%; WBCT: 21.6%). The length of stay in the intensive care unit (pre-WBCT: 10.8 days; WBCT: 9.7 days) and in hospital (pre-WBCT: 26.2 days; WBCT: 23.3 days) decreased. There was no difference in overall mortality (pre-WBCT: 15.5%; WBCT: 15.6%).

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