Changes in trauma management following the implementation of the whole-body computed tomography: a retrospective multicentre study based on the trauma registry of the German Trauma Society (TraumaRegister DGU®)

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Abstract

Objectives Whole-body computed tomography (WBCT) plays an increasingly important role in the diagnostic assessment of trauma room patients. It is still unclear whether its use has led to changes of trauma room procedures and patient outcomes.

Methods In a retrospective multi-centric study based on the trauma registry of the German Trauma Society (TraumaRegister DGU®), we analysed patients with an ISS ≥ 9 between 2002 and 2013. Two periods of time, i.e. up to 3 years preceding (pre-WBCT) and up to 3 years following the introduction of the WBCT (WBCT-group), were assessed separately for every hospital (TR-DGU Project ID 2014-020).

Results 19,838 patients underwent treatment in 77 hospitals. Of these, 5,621 were assigned to the pre-WBCT group and 11,307 to the WBCT group. Basic data did not differ relevantly. The time spent in the trauma room decreased from 77.9 min (pre-WBCT) to 63.3 min (WBCT). Following the introduction of the trauma scan, the number of diagnoses per patient increased from 4.6 to 5.1. The percentage of patients who underwent surgery immediately after the completion of trauma room procedures decreased from 44.5 to 39.1%. There was an increase in mortality from 15.7 to 15.9%.

Conclusions Routine use of WBCT is not superior to a combination of conventional radiography, ultrasound and focused CT in terms of mortality. The entire process involving the introduction of the trauma scan and the further development of algorithms has caused changes that can be observed in the trauma room setting.

Keywords Multiple trauma · Tomography spiral computed · Tomography X-ray computed · Algorithms · Diagnostic imagine · Outcome

Background

Algorithms are intended to facilitate, standardise and structure decision-making processes. Trauma room algorithms define clear diagnostic and therapeutic priorities that are ultimately directed at improving patient outcome. Diagnostic evaluation is a crucial part of the management of patients in the trauma room setting and helps physicians prioritise and target treatment depending on the injuries identified. Conventional radiography, ultrasound and computed tomography (CT) are imaging modalities that are available in the trauma room. If CT is the only initial imaging modality, CT findings must be available as early as or earlier than the results of conventional radiography and ultrasound. This condition was met in 1998 when technical advances in CT technology led to the introduction of spiral and multi-slice computed tomography (MSCT). This technique allows large volumes of image data to be acquired within a short period of time [1, 2]. In recent years, an increasing number of hospitals have used MSCT to obtain...