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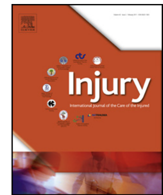

Compliance to prehospital trauma triage protocols worldwide: A systematic review

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ABSTRACT

Background: Emergency medical services (EMS) providers must determine the injury severity on-scene, using a prehospital trauma triage protocol, and decide on the most appropriate hospital destination for the patient. Many severely injured patients are not transported to higher-level trauma centres. An accurate triage protocol is the base of prehospital trauma triage; however, ultimately the quality is dependent on the destination decision by the EMS provider. The aim of this systematic review is to describe compliance to triage protocols and evaluate compliance to the different categories of triage protocols.

Methods: An extensive search of MEDLINE/Pubmed, Embase, CINAHL and Cochrane library was performed to identify all studies, published before May 2018, describing compliance to triage protocols in a trauma system. The search terms were a combination of synonyms for 'compliance,' 'trauma,' and 'triage'.

Results: After selection, 11 articles were included. The studies showed a variety in compliance rates, ranging from 21% to 93% for triage protocols, and 41% to 94% for the different categories. The compliance rate was highest for the criterion: penetrating injury. The category of the protocol with the lowest compliance rate was: vital signs. Compliance rates were lower for elderly patients, compared to adults under the age of 55. The methodological quality of most studies was poor. One study with good methodological quality showed that the triage protocol identified only a minority of severely injured patients, but many of whom were transported to higher-level trauma centres.

Conclusions: The compliance rate ranged from 21% to 94%. Prehospital trauma triage effectiveness could be increased with an accurate triage protocol and improved compliance rates. EMS provider judgment could lower the undertriage rate, especially for severely injured patients meeting none of the criteria. Future research should focus on the improvement of triage protocols and the compliance rate.

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Background

Each year, over 5 million people die as a result of trauma, accounting for 9% of the world's deaths. However, many more patients who survive their injury are left with temporary or permanent disabilities [1]. Timely and adequate treatment is crucial for patient outcomes [2]. Prehospital trauma care by emergency medical services (EMS) providers marks the start of trauma care. The EMS providers must start initial treatment and transport the patient to the most appropriate trauma centre. To improve chances of survival and avert life-long disabilities, severely injured patients should be treated at higher-level trauma centres that have the appropriate trauma care facilities [3,4]. On the other hand, patients without severe injuries must be transported to lower-level trauma centres, in order to lessen unnecessary burden on higher-level trauma centres and prevent relatively high costs [3,4].

EMS providers use a prehospital trauma triage protocol to evaluate injury severity on-scene, and subsequently decide the most appropriate level trauma centre for the patient [2,5,6]. The accuracy of the triage protocol itself is fundamental: it must be able to discriminate between patients in need of specialized trauma care. Secondly, compliance to triage protocols by EMS providers is important in order to guarantee transportation to a higher-level trauma centre when indicated by the criteria. Previous studies have shown that many severely injured patients are not transported to higher-level trauma centres [7–12].

Prehospital trauma triage protocols have been extensively studied over the past decades [7,13–16]; however, it is currently unknown to what extent compliance to triage protocols influences prehospital trauma triage quality. The aim of this systematic review is to describe compliance to triage protocols and evaluate compliance to the different categories of triage protocols.

Methods

Search

An extensive search of MEDLINE/Pubmed, Embase, CINAHL and Cochrane library was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [17]. All studies published before May 2018 on compliance to prehospital trauma triage protocols were eligible for inclusion. The search terms were a combination of synonyms for 'compliance,' 'trauma' and 'triage' (Appendix A).

Eligibility criteria

Studies describing the compliance rate to prehospital trauma triage protocols were included. All articles, regardless of year of publication or language, were eligible for inclusion. Exclusion criteria were: grey literature (i.e. conference abstracts, editorials and dissertations), articles describing only helicopter transport or including only paediatric patients. Studies on helicopter transport use a separate triage protocol to identify patients requiring helicopter transport among the patients in need of higher-level trauma centre care [18,19]. Paediatric trauma patients differ significantly from adults in for example physiology and mechanism of injury [20–23]. Studies on compliance to triage protocol for helicopter transport and paediatric trauma patients require, in our opinion, a separate review.

Critical appraisal

Due to the specific design of the studies, none of the available critical appraisal tools were fully applicable. To assess the risk of bias of the included studies, criteria from the critical appraisal tools from the Centre for Evidence Based Medicine of the University of Oxford were used [24]. The critical appraisal was specifically designed to assess the methodological quality of studies on the compliance to prehospital trauma triage protocols. It consisted of six items: study setting, domain, collection of data, time of measurements, description of initial transport and missing data (Table 1). Two reviewers (EvR and MvH) assessed the risk of bias independently, discrepancies were discussed until consensus was reached.

Data extraction

Prior to the selection of relevant articles, all duplicates were excluded. Two reviewers (EvR and AR) independently assessed titles, abstracts and full-texts, subsequently, eligible studies were included. Discrepancies were discussed with a third reviewer (MvH) until consensus was reached. One reviewer

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