



Contents lists available at ScienceDirect

Chinese Journal of Traumatology

journal homepage: <http://www.elsevier.com/locate/CJTEE>

Original Article

Why do some trauma patients die while others survive? A matched-pair analysis based on data from Trauma Register DGU®

Dan Bieler^{a, f, *, 1}, Thomas Paffrath^{b, 1}, Annelie Schmidt^a, Maximilian Völlmecke^a, Rolf Lefering^c, Martin Kulla^d, Erwin Kollig^a, Axel Franke^a, Sektion NIS of the German Trauma Society^e^a Department of Trauma Surgery and Orthopaedics, Reconstructive and Hand Surgery, Burn Medicine, German Armed Forces Central Hospital Koblenz, Koblenz 56072, Germany^b Department of Trauma and Orthopaedic Surgery, Witten/Herdecke University, Faculty of Health – School of Medicine, Cologne, 51109, Germany^c Institute for Research in Operative Medicine, Witten/Herdecke University, Cologne, 51109, Germany^d Department of Anaesthesiology and Intensive Care, German Armed Forces Hospital Ulm, Ulm, 89081, Germany^e Committee on Emergency Medicine, Intensive Care and Trauma Management (Sektion NIS) of the German Trauma Society (DGU), Germany^f Department of Orthopaedics and Trauma Surgery, Heinrich Heine University Hospital, Düsseldorf, 40225, Germany

ARTICLE INFO

Article history:

Received 4 October 2019

Received in revised form

21 November 2019

Accepted 2 January 2020

Available online xxx

Keywords:

Emergency medicine

Registries

Mortality

Severely injured patients

ABSTRACT

Purpose: The mortality rate for severely injured patients with the injury severity score (ISS) ≥ 16 has decreased in Germany. There is robust evidence that mortality is influenced not only by the acute trauma itself but also by physical health, age and sex. The aim of this study was to identify other possible influences on the mortality of severely injured patients.

Methods: In a matched-pair analysis of data from Trauma Register DGU®, non-surviving patients from Germany between 2009 and 2014 with an ISS ≥ 16 were compared with surviving matching partners. Matching was performed on the basis of age, sex, physical health, injury pattern, trauma mechanism, conscious state at the scene of the accident based on the Glasgow coma scale, and the presence of shock on arrival at the emergency room.

Results: We matched two homogeneous groups, each of which consisted of 657 patients (535 male, average age 37 years). There was no significant difference in the vital parameters at the scene of the accident, the length of the pre-hospital phase, the type of transport (ground or air), pre-hospital fluid management and amounts, ISS, initial care level, the length of the emergency room stay, the care received at night or from on-call personnel during the weekend, the use of abdominal sonographic imaging, the type of X-ray imaging used, and the percentage of patients who developed sepsis. We found a significant difference in the new injury severity score, the frequency of multi-organ failure, hemoglobine at admission, base excess and international normalized ratio in the emergency room, the type of accident (fall or road traffic accident), the pre-hospital intubation rate, reanimation, in-hospital fluid management, the frequency of transfusion, tomography (whole-body computed tomography), and the necessity of emergency intervention.

Conclusion: Previously postulated factors such as the level of care and the length of the emergency room stay did not appear to have a significant influence in this study. Further studies should be conducted to analyse the identified factors with a view to optimising the treatment of severely injured patients. Our study shows that there are significant factors that can predict or influence the mortality of severely injured patients.

© 2020 Chinese Medical Association. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

According to Trauma Register DGU®, the mortality rate for severely injured patients with an injury severity score (ISS) ≥ 16 has continuously decreased in Germany in recent years. While the observed hospital mortality rate for this patient population was

* Corresponding author. Department of Trauma Surgery and Orthopaedics, Reconstructive and Hand Surgery, Burn Medicine, German Armed Forces Central Hospital Koblenz, Koblenz 56072, Germany.

E-mail address: dr.dan.bieler@t-online.de (D. Bieler).

Peer review under responsibility of Chinese Medical Association.

¹ The authors Bieler D and Paffrath T considered as first co-authors.

<https://doi.org/10.1016/j.cjtee.2020.05.001>

1008-1275/© 2020 Chinese Medical Association. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).