

ORIGINAL RESEARCH

Open Access



Damage to the eye and optic nerve in seriously traumatized patients with concomitant head injury: analysis of 84,627 cases from the TraumaRegister DGU® between 2002 and 2015

Torge Huckhagel^{1*} , Jan Regelsberger¹, Manfred Westphal¹, Jakob Nüchtern² and Rolf Lefering³

Abstract

Background: To determine the prevalence and characteristics of prechiasmatic visual system injuries (VSI) among seriously injured patients with concomitant head trauma in Europe by means of a multinational trauma registry.

Methods: The TraumaRegister DGU® was searched for patients suffering from serious trauma with a Maximum Abbreviated Injury Scale (AIS) ≥ 3 between 2002 and 2015 in Europe. After excluding cases without significant head injury defined by an AIS ≥ 2 , groups were built regarding the existence of a concomitant damage to the prechiasmatic optic system comprising globe and optic nerve. Group comparisons were performed with respect to demographic, etiological, clinical and outcome characteristics.

Results: 2.2% (1901/84,627) of seriously injured patients with concomitant head trauma presented with additional VSI. These subjects tended to be younger (mean age 44.7 versus 50.9 years) and were more likely of male gender (74.8% versus 70.0%) compared to their counterparts without VSI. The most frequent trauma etiologies were car accidents in VSI patients (28.5%) and falls in the control group (43.2%). VSI cases were prone to additional soft tissue trauma of the head, skull and orbit fractures as well as pneumocephalus. Primary treatment duration was significantly longer in the VSI cohort (mean 23.3 versus 20.5 days) along with higher treatment costs and a larger proportion of patients with moderate or severe impairment at hospital discharge despite there being a similar average injury severity at admission in both groups.

Conclusions: A substantial proportion of patients with head injury suffers from additional VSI. The correlation between VSI and prolonged hospitalization, increased direct treatment expenditures, and having a higher probability of posttraumatic impairment demonstrates the substantial socioeconomic relevance of these types of injuries.

Keywords: Craniocerebral trauma, Epidemiology, Eye injuries, Optic nerve injuries

* Correspondence: torgehuckhagel@gmx.de

¹Department of Neurosurgery, University Medical Center
Hamburg-Eppendorf, Hamburg, Germany

Full list of author information is available at the end of the article



© The Author(s). 2020 **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.