

Improving Initial Trauma Management- What's Next?

Gerrit Matthes*

Department of Orthopedics and Trauma Surgery, Unfallkrankenhaus Berlin, Trauma Center, 12683 Berlin, Germany

*Corresponding author: Gerrit Matthes, Department of Orthopedics and Trauma Surgery, Unfallkrankenhaus Berlin, Trauma Center, 12683 Berlin, Germany, Tel: +49 30 5681 0; Fax: +49 30 5630 1475; E-mail: gerrit.matthes@ukb.de

Received date: April 22, 2014; Accepted date: April 23, 2014; Published date: April 26, 2014

Copyright: © 2014 Matthes G. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Introduction

Severe injury still plays a crucial role among cause of death particularly in younger individuals worldwide. Here, especially traffic accidents are of key importance.

For that the UN pronounced the Decade of Action for Road Safety 2011-2020 [1].

Although the number of traffic accident fatalities seems to decrease worldwide there are still certain variations. In 2011 the number of deceased after accidents in Germany increased after 20 years of continuous decrease. However, out of our view those statistics do represent more a snapshot than a turnaround [2].

Nevertheless further attempts to improve trauma care are mandatory.

Preclinical Management

Within an extensive systematic analysis of trauma associated fatalities in the German capital city Berlin as well multiple trauma as the isolated traumatic brain injury were figured out as leading cause of death. Moreover the authors were able to identify two hotspots of trauma management- preclinical care and ICU. Thus they suggest a certain shift of the former asserted „trimodal“ contribution of death towards a „bimodal“ contribution of death [3].

Within another study the same authors found that 15,2% of all trauma-associated deaths were to be classified as preventable [4].

This points out that further efforts to improve education and skills of preclinical medical personnel are of somewhat high importance.

Another focus of interest is the predictive value of as well technical as clinical parameters to be harvested on scene of accident.

Within an own investigation we were able to demonstrate that neither basic technical parameters that are easy to obtain after a car crash nor additional technical information markedly contribute to the emergency physician's estimation of a vehicle driver's injury severity [5].

Also the estimation of external loss of blood on scene of accident is critical. However, estimations are influenced impressively by the given vital parameters. For both stable and unstable patients, small actual volumes were overestimated, whereas higher volumes tended to be underestimated [6].

In addition, the classification of hypovolemic shock suggested by the renowned Prehospital Trauma Life Support- (PHTLS-) program shows certain weaknesses [7].

There are certain discussions going on concerning requested technical skills for emergency medical service personnel.

Bernhard et al. set out to verify the learning curve of endotracheal intubation (ETI) skills within a prospective single center study. They concluded that approximately 200 supervised endotracheal intubations are needed to gain a satisfying ETI experience [8]. However, out of our view this study raises a number of questions. A final requirement for qualifications in emergency medicine may not been concluded from this study.

While several studies concerning the transportation of the injured to a suitable clinic do favor helicopter transfer a recent Cochrane review of Galvagno et al. states that there is not enough evidence given at this point [9].

Shock Room

For a long time the success rate of cardiopulmonary resuscitation after traumatic cardiac arrest was supposed to be very low. Graesner et al. demonstrated that at least in 29,1% of cases spontaneous circulation could be achieved. Even so the overall hospital mortality was still 73% [10].

In 2013 Lockey et al. introduced a simple algorithm to guide the effective management of traumatic cardiac arrest [11].

During the last decades Advanced Trauma Life Support (ATLS) has gained a major role in trauma management protocols worldwide. Also in Germany this program has been implemented very successful [12]. However, still there is no clear evidence concerning the positive effect of this program on the outcome after management of severe injury. In 2011 Drimoudis et al. stated an even worse outcome after implementation of ATLS in Greece [13]. Nevertheless also this study had weaknesses as regards content [14].

Scientifically sound studies are needed.

In 2011 the German Trauma Society introduced interdisciplinary evidence based S3-Guidelines for multiple injury care as a fundamental progress [15].

Recent studies suggest a clear positive effect on outcome after severe trauma when implementing these guidelines [16].

Yet unpublished data show a clear accordance of ATLS contents with these guidelines.

Initial diagnostics play a crucial role during initial trauma management. Within a Cochrane Review Stengel et al. stated that there is currently insufficient evidence from RCTs to justify promotion of ultrasound-based clinical pathways in diagnosing patients with suspected blunt abdominal trauma [17].

On the other hand initial Whole Body CT Scan (WBCT) has gained major importance during initial diagnostics. Frequency and pattern of organ injury within multiple trauma have been described in very detail after implementing computer tomography [18]. A noteworthy study

demonstrated the positive effect of an initial WBCT regarding outcome after major trauma [19].

Within an own study we found that the pan-scan algorithms reduces, but does not eliminate, the risk of missed injuries. Especially regarding injuries to hollow organs the sensitivity of the WBCT is comparable low.

Furthermore we found the best balance between sensitivity and specificity when the pan-scan was performed about 30 minutes after admission.

In addition to better visibility of lesions after blood circulation and tissue perfusion are restored, we speculate that the clinical situations that allowed a short delay before scanning were associated with less time pressure when reviewing the CT images [20].

In conclusion we are on a good way to further reduce the number of trauma fatalities but we don't have reached our goal yet.

References

1. http://www.who.int/roadsafety/decade_of_action/en/
2. Brand S, Schmucker U, Lob G, Haasper C, Juhra C, et al. (2014) [Increasing Number of Road Traffic Fatalities in Germany - Turnaround or Snap-Shot.] *Zentralbl Chir* [Epub ahead of print].
3. Kleber C, Giesecke MT, Tsokos M, Haas NP, Schaser KD, et al. (2012) Overall distribution of trauma-related deaths in Berlin 2010: advancement or stagnation of German trauma management? *World J Surg* 36: 2125-2130.
4. Kleber C, Giesecke MT, Tsokos M, Haas NP, Buschmann CT (2013) Trauma-related preventable deaths in Berlin 2010: need to change prehospital management strategies and trauma management education. *World J Surg* 37: 1154-1161.
5. Matthes G, Schmucker U, Frank M, Huwer C, Ekkernkamp A, et al. (2013) [Assessment of injury severity at the accident scene by the emergency physician: utility of technical crash parameters: results of a pilot study]. *Unfallchirurg* 116: 825-830.
6. Frank M, Schmucker U, Stengel D, Fischer L, Lange J, et al. (2010) Proper estimation of blood loss on scene of trauma: tool or tale? *J Trauma* 69: 1191-1195.
7. Mutschler M, Nienaber U, Münzberg M, Fabian T, Paffrath T, et al. (2014) Assessment of hypovolaemic shock at scene: is the PHTLS classification of hypovolaemic shock really valid? *Emerg Med J* 31: 35-40.
8. Bernhard M, Mohr S, Weigand MA, Martin E, Walther A (2012) Developing the skill of endotracheal intubation: implication for emergency medicine. *Acta Anaesthesiol Scand* 56: 164-171.
9. Galvagno SM Jr, Thomas S, Stephens C, Haut ER, Hirshon JM, et al. (2013) Helicopter emergency medical services for adults with major trauma. *Cochrane Database Syst Rev* 3: CD009228.
10. Gräsner JT, Wnent J, Seewald S, Meybohm P, Fischer M, et al. (2011) German Resuscitation Registry Working Group, Trauma Registry of the German Society for Trauma Surgery (DGU): Cardiopulmonary resuscitation traumatic cardiac arrest- there are survivors. An analysis of two national emergency registries. *Crit Care* 15: R276.
11. Lockey DJ, Lyon RM, Davies GE (2013) Development of a simple algorithm to guide the effective management of traumatic cardiac arrest. *Resuscitation* 84: 738-742.
12. Münzberg M, Mahlke L, Bouillon B, Paffrath T, Matthes G, et al. (2010) [Six years of Advanced Trauma Life Support (ATLS) in Germany: the 100th provider course in Hamburg]. *Unfallchirurg* 113: 561-566.
13. Drimousis PG, Theodorou D, Toutouzias K, Stergiopoulos S, Delicha EM, et al. (2011) Advanced Trauma Life Support certified physicians in a non trauma system setting: is it enough? *Resuscitation* 82: 180-184.
14. Flohe S, Bouillon B, Stengel D, Paffrath T, Matthes G, et al. (2011) ATLS-certified physicians and outcome from trauma. *Resuscitation* 82: 1356.
15. Neugebauer EA, Waydhas C, Lendemans S, Rixen D, Eikermann M, et al. (2012) The treatment of patients with severe and multiple traumatic injuries. *Dtsch Arztebl Int* 109: 102-108.
16. Schoeneberg C, Schilling M, Keitel J, Kauther MD, Burggraf M, et al. (2014) TraumaNetwork, Trauma Registry of the DGU*, Whitebook, S3 Guideline on Treatment of Polytrauma/Severe Injuries - An Approach for Validation by a Retrospective Analysis of 2304 Patients (2002-2011) of a Level 1 Trauma Centre. *Zentralbl Chir*.
17. Stengel D, Bauwens K, Rademacher G, Ekkernkamp A, Güthoff C (2013) Emergency ultrasound-based algorithms for diagnosing blunt abdominal trauma. *Cochrane Database Syst Rev* 7: CD004446.
18. Matthes G, Stengel D, Bauwens K, Seifert J, Rademacher G, et al. (2006) Predictive factors of liver injury in blunt multiple trauma. *Langenbecks Arch Surg* 391: 350-354.
19. Huber-Wagner S, Lefering R, Qvick LM, Körner M, Kay MV, et al. (2009) Working Group on Polytrauma of the German Trauma Society: Effect of whole-body CT during trauma resuscitation on survival: a retrospective, multicentre study. *Lancet* 373: 1455-1461.
20. Stengel D, Ottersbach C, Matthes G, Weigeldt M, Grundei S, et al. (2012) Accuracy of single-pass whole-body computed tomography for detection of injuries in patients with major blunt trauma. *CMAJ* 184: 869-876.