



Observed versus expected mortality in pediatric patients intubated in the field with Glasgow Coma Scale scores < 9

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Abstract

Purpose A Glasgow Coma Scale (GCS) score of 8 or less in patients suffering from severe traumatic brain injury (TBI) represents a decision-making marker in terms of intubation. This study evaluated the impact of prehospital intubation on the mortality of these TBI cases among different age groups.

Methods This study included the data from patients predominantly suffering from severe TBI [Abbreviated Injury Scale (AIS) of the head ≥ 3 , GCS score < 9, Injury Severity Score (ISS) > 9] who were registered in TraumaRegister DGU® from 2002 to 2013. An age-related analysis of five subgroups was performed (1–6, 7–15, 16–55, 56–79, and ≥ 80 years old). The observed and expected mortality were matched according to the Revised Injury Severity Classification, version II.

Results A total of 21,242 patients were included. More often, the intubated patients were severely injured when compared to the non-intubated patients (median ISS 29, IQR 22–41 vs. 24, IQR 16–29, respectively), with an associated higher mortality (42.2% vs. 30.0%, respectively). When compared to the calculated expected mortality, the observed mortality was significantly higher among the intubated patients within the youngest subgroup (42.2% vs. 33.4%, respectively; $p = 0.03$).

Conclusions The observed mortality in the intubated children 1–6 years old suffering from severe TBI seemed to be higher than expected. Whether or not a GCS score of 8 or less is the only reliable criterion for intubation in this age group should be investigated in further trials.

Keywords Glasgow Coma Scale · Intubation · Pediatric · Prehospital · Traumatic brain injury

Introduction

Hypoxia is associated with increased mortality in patients suffering from severe traumatic brain injury (TBI), which underscores the impact of adequate airway management [1–3]. Although intubation is considered to be the standard procedure for managing patients suffering from severe TBI with Glasgow Coma Scale (GCS) scores < 9 in Germany [4, 5], there is a lack of evidence confirming this approach. The reasons for this controversy surrounding prehospital intubation include the potential benefits, such as maintaining the airway, preventing aspiration, and improving oxygenation, weighed against the risks, such as a prolonged scene time, multiple intubation attempts, improper tube placement, and hyperventilation resulting in hypocapnia [6, 7]. A publication by Hoffmann et al. showed better outcomes and lower mortality rates for those patients that were both intubated and sedated in the prehospital setting [8]. Other surveys

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