

2012

“Pre-Hospital airway management in severe traumatic brain injury – the importance of education, evaluation and research”

Helen Webb

Recommended Citation

Webb, H. (2003). “Pre-Hospital airway management in severe traumatic brain injury – the importance of education, evaluation and research”. *Australasian Journal of Paramedicine*, 1(3).

Retrieved from <http://ro.ecu.edu.au/jephc/vol1/iss3/25>

This Conference Proceeding is posted at Research Online.

<http://ro.ecu.edu.au/jephc/vol1/iss3/25>

ACAP Conference Abstracts 2003

Abstract No. 990056-25

"Pre-Hospital airway management in severe traumatic brain injury – the importance of education, evaluation and research"

Helen Webb

Lecturer, School of Public Health, Charles Sturt University

Review of Literature

Traumatic Brain Injury (TBI) is a major cause of disability, death and economic cost to society. Brain injury evolves over hours to days after the primary insult. These evolving secondary insults have been demonstrated to have a deleterious effect on patient functional outcome (Brain Trauma Foundation 2000).

The deleterious effects of hypoxaemia on patient outcome following severe TBI have been well established. Pre-hospital hypoxaemia in TBI patients (arterial haemoglobin saturation < 90%) is a parameter associated with poor patient outcome (Brain Trauma Foundation 2000). The causality of hypoxaemia can include patient hypoventilation, lack of assisted ventilation or oxygenation, poor airway management, or the non-use of appropriate airway adjuncts.

According to the Brain Trauma Foundation (2000), the efficacy of pre-hospital treatment of brain trauma patients has not been adequately evaluated. Studies have shown the efficacy of pre-hospital care in the reduction of mortality rates following cardiac arrest, however, the ability of pre-hospital emergency care systems to reduce mortality rates in cases of severe trauma is unknown (Demetriades et al. 1996).

Methodology

A retrospective cohort study was undertaken to investigate the relationship between pre-hospital management and functional outcome of persons with severe traumatic brain injury Glasgow Coma Score (GCS) < 9 in the Sydney metropolitan area from June 1999 to July 2001. Descriptive analysis on airway management has been completed for the first 100 cases.

Results

On arrival at the Emergency Department (ED), 30% (n=30) of patients presented with an airway obstruction unrelieved in the pre-hospital setting. The major cause of airway obstruction was blood in the airway (23%). A total of 36.5% (n=19) of patients with a GCS of 3-4 (n=50), presented at ED with an airway obstruction.

On arrival at ED 10.0% of patients had an oxygen saturation level of less than 85% (n=10), 2.0% (n=2) with saturation between 85-89, 9.0% (n=9) with saturation between 90-94 and 67.0% (n=67) with saturation between 95-100%. In twelve cases, the oxygen saturation levels were not documented at ED.

Of those patients with a GCS of 3-4 (n=50), 18% received no airway adjunct, 60% received an oropharyngeal airway, 8% a nasopharyngeal airway and 14% were intubated.

Outcome was measured using the Glasgow Outcome Scale (GOS) at discharge from hospital. A total of 37.4% of patients died, whilst 6.1% of patients were in a persistent vegetative state. Severe disability was experienced by 17.2% of patients; moderate

disability by 5.1%, whilst 34.3% of patients made a good recovery (may have minor neurological or psychological deficits).

A total of 56% (n=56) of patients were transported to the closest hospital which was an Area Trauma Hospital (ATH), 30% (n=30) bypassed the local hospital for an ATH and 14% (n=14) of patients were transported to a District hospital. All 14 patients initially transported to the District hospital were later transferred to an ATH for neurosurgical assessment and intervention.

Conclusion

Significant airway management problems exist within the pre-hospital setting with respect to patients experiencing severe TBI. A significant number of patients with severe TBI are experiencing hypoxaemia in the pre-hospital setting. Hypoxaemia has been demonstrated to adversely affect function outcome following severe TBI.

Implications for pre-hospital care education are widespread. Extensive curriculum content on airway anatomy, physiology, pathophysiology and effective airway management procedures are essential to improve neurological outcome. Moreover, evaluation of clinical practice needs to be undertaken to ensure an optimal relationship between pre-hospital management and patient outcome.

References

Brain Trauma Foundation 2000, *Management and prognosis of severe traumatic brain injury*, Brain Trauma Foundation, New York, USA.

Brain Trauma Foundation 2000, *Guidelines for the pre-hospital management of traumatic brain injury*, Brain Trauma Foundation, New York, USA.

Demetriades, D, Chan, L, Cornwell, E, Belzberg, H, Berne, T, Asensio, J, Chan, D, Eckstein, M & Alo, K. 1996. Paramedic vs private transportation of trauma patients, *Archives of Surgery*, **131**, pp.133-138.

Acknowledgments

The author wishes to thank Christine Meek and Garrick Burgess, graduate students, for their assistance with data entry.