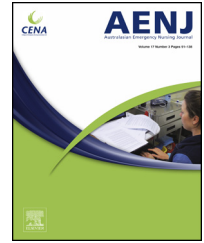




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DISCUSSION PAPER

Initial emergency nursing management of patients with severe traumatic brain injury: Development of an evidence-based care bundle for the Thai emergency department context



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Summary

Background: Thai emergency nurses play a vital role in caring for patients with severe TBI, and are an important part of the healthcare team throughout the resuscitation phase. They are also responsible for continuous physiological monitoring, and detecting deterioration associated with increased intracranial pressure and preventing secondary brain injury. However, there is known variation in Thai nurses' knowledge and care practices for patients with severe TBI. In addition, there are no specific evidence-based practice guidelines available for emergency nursing management of patients with severe TBI.

Aim: The aim of this paper is to describe the development of an evidence-based care bundle for initial emergency nursing management of patients with severe TBI for use in a Thai ED context.

Results: An evidence-based care bundle focused on seven major elements: (1) establish a secure airway along with c-spine protection, (2) maintain adequacy of oxygenation and ventilation, (3) maintain circulation and fluid balance, (4) assessment of GCS, and pupil size and reactivity,

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(5) maintain cerebral venous outflow, (6) management of pain, agitation, and irritability, and (7) administer for urgent CT scan.

Conclusions: A care bundle is one method of promoting consistent, evidence-based emergency nursing care of patients with severe TBI, decreasing unnecessary variations in nursing care and reducing the risk of secondary brain injury from suboptimal care. Implementation of this evidence-based care bundle developed specifically for the Thai emergency nursing context has the potential to improve the care of the patients with severe TBI.

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Introduction

In Thailand, incidence of hospitalisation from traumatic brain injury (TBI) is increasing,¹ mostly due to the severity and the impact of road traffic accidents (RTAs).² According to the Bureau of Policy and Strategy reports, the number of patients with severe TBI rose dramatically by approximately 18%, from 70,134 cases in 2007 to 82,993 cases in 2010, in every region of Thailand.¹ RTAs are the major cause of severe TBI.² In 2007, a study of severe injury due to transport accidents in 28 Thai regional and tertiary hospitals indicated that approximately 6% ($n=4852$) died from RTAs, and 80% ($n=62,934$) were seriously injured.² Almost 30% ($n=39,911$) of RTA cases studied sustained isolated head injuries, and approximately 17% ($n=23,023$) had multiple injuries.² Due to the increasing number of persons suffering TBI and specifically severe TBI, the management of severe TBI is a continuing challenge for Thai healthcare providers, particularly for emergency department (ED) clinicians providing initial care for patients with severe TBI.

Severe TBI is defined as a Glasgow Coma Scale (GCS) score of 8 or less.^{3,4} Evidence-based guidelines for the management of severe TBI initially developed in Western countries have been adapted for use in Thai ED settings.⁵ However, there are several gaps identified in relation to implementing an evidenced-based guideline for care of patients with severe TBI in the Thai ED context. Firstly, Thai emergency care varies greatly from Western countries, particularly in terms of trauma care systems and emergency care facilities. In Western countries, emergency medical services personnel-paramedics are often the first healthcare providers to assess and treat patients with severe TBI according to the advanced trauma life support (ATLS) protocols.⁶ In addition, the paramedics in Western countries are commonly enabled to commence advanced treatment including medication administration in the field.^{7,8} In Thailand, however, pre-hospital care for patients with severe TBI is variable depending on the attending staff and equipment available on the scene,⁹ and the essential care for patients with severe TBI according to ATLS concepts are mostly commenced in the ED.⁵ Second, the majority of the guidelines for the management of patients with severe TBI focus on physician care^{5,10} however in Thailand like many other countries, it is emergency nurses who are responsible for emergency care delivery and who are with the patient for the entirety of their ED episode of care. Physician input into the care of patients with severe TBI is episodic and intermittent and it is emergency nurses who make decisions regarding type and frequency of

physiological monitoring, cervical spine precautions, patient positioning, and urgent CT scan administration.^{11,12} Third, there is known variation in Thai nurses' knowledge and care practices for patients with severe TBI.¹³ Some elements of variation are placing patients at risk of harm particularly increased intracranial pressure and risk of secondary brain injury.¹³ Finally, in Thailand there are no specific evidence-based practice guidelines available for emergency nursing management of patients with severe TBI that are suitable for the Thai ED context.

Aims

The aim of this paper is to describe the development of an evidence-based care bundle for initial emergency nursing management of patients with severe TBI for use in a Thai ED context. For the purposes of the development of the care bundle, 'severe TBI' was defined as a Glasgow Coma Scale (GCS) score of 8 or less, and 'initial' emergency nursing management was defined as nursing care delivered to the patients with severe TBI from arrival to the ED until the patient was transferred to another department. The term of 'care bundle' is defined as a small number of evidence-based practice elements; generally limited to three to five key elements, which, when executed together, result in better outcomes than when implemented individually.¹⁴

The care bundle for initial emergency nursing management of patients with severe TBI was developed specifically for the Thai ED context so the ED structure, staffing, processes and resources of the emergency healthcare system were major considerations during the development process. It is therefore important to understand the ED context in Thailand and the local conditions at the regional hospital where the care bundle was developed and then implemented so the sections to follow will provide detail about the structure and process of emergency care in Thailand and specifically at the hospital where the care bundle was developed.

Emergency care in Thailand

In Thailand, severe TBI patients will be commonly taken to an ED by an ambulance through the emergency medical service (EMS) system, which has responded to an emergency '1669' call. For patients with severe TBI, ED medical and nursing staff working as ALS personnel will be the first healthcare providers to go out as part of the EMS/ambulance response. Larger government and private hospitals, mostly around the centre of Thailand, tend to have the best

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