guidelines represent the first national, evidence-based standards for pediatric disaster and terrorism preparedness.

The methodology used to develop the guidelines and recommendations in the current report was one of a previously validated, evidenced-based, consensus process used in prior studies, supplemented by a modified Delphi approach for topic selection. Experts from multiple disciplines and areas of expertise involved in the planning for and care of children during times of disaster and/or terrorist events were convened for the discussion. There were several goals of this process:

1. To build collaboration among individuals with expertise in pediatrics, pediatric emergency medicine, pediatric critical care, pediatric surgery, and emergency management (including disaster planning, management, and response);
2. To review and summarize the existing data on the needs of children in disaster planning, preparation, and response;
3. To develop evidence-based guidelines and recommendations on the needs of children in disasters, and develop evidence-based consensus guidelines for dealing with the gaps in the evidence; and
4. To create a research agenda to address knowledge gaps based on the limited data that exist on the needs of children in disasters.

The final recommendations of the conference focused on three major areas: (1) emergency and prehospital care; (2) hospital care; and (3) terrorism preparedness and response, including biological terrorism, chemical terrorism, radiological terrorism, physical protection, decontamination, and the Strategic National Stockpile (SNS).

Keywords: children; disasters; events; guidelines; preparedness; response; terrorism
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Special Seminar: The Tsunami of Southeast Asia

Theme 4: Transport Medicine

Chair: Per Ortenwall

Emergency Air-medical Transport of Patients with Severe Head Injuries from a Remote Island to Taiwan

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Introduction: Transporting patients with severe head injuries has been considered a great challenge to medical professionals. Although the severity of head injuries directly affects patient outcome, the professional dedication of all parties during transport plays a significant role on patient survival. On the remote island of Taiwan, the shortage of neurosurgical professionals and facilities has resulted in increasing demands on emergency air-medical services (EAMS) for patient transport. The quality of EAMS between Taiwan and the remote islands has become an important issue, which directly relates to the outcome of patients with severe head injuries.

Objectives: To investigate the outcome of patients with head injuries transported by fixed-wing, air ambulances.

Methods: Medical records of patients transported from Kinmen, an outer island of Taiwan, during January 2001 and August 2004 were reviewed. A total of 426 cases were transported during this period. Demographic information about these patients, including age, gender, mechanism of injury, Glasgow Coma Scale Score (GCS), and the use of a ventilator, was entered into a database for further statistical analysis.

Results: All patients were transported to the receiving hospital within eight hours. Patients' demographic characteristics in two groups were similar in gender, mean age, and the mode of transport; and they were transported to the same receiving hospitals. Among the 72 patients with head injuries, 39.1% (n = 18) of the patients had severe head injuries (GCS <9). The mean value of the ages was 45.0 ±20.57 years. The majority of patients were male (male:female ratio = 3:1). In the study group, 26.4% were between the ages of 16 and 30 years old (n = 19, $p = 0.022$).

Nearly 40% of the patients required mechanical ventilation ($p = 0.024$), and most of them were comatose ($p = 0.04$). Eight patients (19.0%) did not survive (survival rate = 81%), and the findings were significantly different compared to the control group (survival rate 95.1%, $p = 0.004$). In the study group, four patients (9.5%) were not transported due to deterioration of their condition, one patient expired on arrival at the receiving hospital, and three patients expired within 24 hours after transport ($p = 0.006$).

The overall mortality rate for patients with head injuries was 19.0% and the mortality rate for patients with severe head injury was 44.4%.

Conclusion: The critical condition of patients and the mortality rates demonstrate a critical task for emergency transport. It is recommended that the quality of EAMS must be defined as an airborne intensive care unit (ICU). Patients with severe head injuries requires a 24-hour alarm center, and the patients transported should be received by neurosurgeons, critical care specialists, and flight nurses with sufficient critical care training carrying ICU-level medical equipments. Most importantly, the guidelines of the World Federation of Neurosurgical Societies (WFNS) for the care of patients with head injuries are strongly recommended as a model.

Keywords: air; head injuries; neurosurgery; prehospital care; Taiwan; transport
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