

EPIDEMIOLOGY AND CHANGING TRENDS OF PEDIATRIC BRAIN DEATH IN AUSTRALASIAN ICUS

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Background

The first edition of the Australia and New Zealand Intensive Care Society (ANZICS) Statement detailing standard practice for brain death (BD) determination was published in 1993, informed by the Harvard Criteria form 1968. Clinical utilization of this process has not been reviewed in the pediatric population.

Aims and hypotheses

We sought to determine the epidemiology of pediatric deaths meeting BD criteria in intensive care units (ICUs) in Australia and New Zealand. We hypothesized that patients with BD would have unique clinical and demographic characteristics.

Significance

This study will inform current practice with implications for future quality improvement initiatives to optimize management of pediatric end-of-life care.

Methods

We identified children (<16 years) who died in ICU between 01/01/2006 and 31/12/2016 from the Australian and New Zealand Pediatric Intensive Care Registry. Primary outcome was ICU mortality diagnosed by BD criteria.

Key Findings

Of 103367 admissions, 430 of 2672 ICU deaths (16.1%) met BD criteria. Compared with other modes of death, decedents with BD were older (58 vs 12 months, $p<0.001$) and more likely to be admitted from an emergency department or inter-hospital transfer and arrest, trauma and neurological diseases were the most common primary admission diagnosis ($p<0.001$). Compared with other modes of death, decedents with BD were 4 times less likely to have a comorbidity or previous ICU admission and 20 times more likely to be an organ donor (OR 3.0-6.0 and 14.3-28.0 respectively $p<0.001$). The ICU length of stay prior to death was 2.4 days shorter in patients with BD versus other modes of death (1.8 vs 4.2 days $p<0.001$). There was an increase in both the absolute number of patients meeting BD criteria ($p=0.0022$) and the proportion of decedents with brain death (0.71%/year, $p<0.005$).

Implications

Patients with brain death are a unique population with implications for palliative care team involvement, decision making and resource allocation. Although the ICU mortality rate for Australian and New Zealand children is declining, the absolute number and proportion of decedents meeting BD criteria is increasing. This necessitates future research to determine if this pattern reflects changes in acute care resuscitation practices or increasing confidence in diagnosing brain death.