Late mortality after severe traumatic brain injury

The first Australian report is welcome and should help inform policy

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Traumatic brain injury (TBI) continues to be a significant public health issue in Australia. Despite advances in acute medical care and decreases in mortality, those affected experience long-term morbidity and have an increased late mortality rate. TBI is the leading cause of death and disability among young people, and the incidence of severe TBI is higher in men than women at a ratio of 3.5 : 1.[1] The leading causes of TBI include: motor vehicle accidents (50%); falls (21%); violence (12%); and sports and recreation (10%).[2] In Australia in 2008, there were 2493 new cases of TBI (about 1000 of these were severe),[2] and the estimated total cost of care was $8.6 billion. Across Australia, lifetime cost per incident case of severe TBI was estimated at $4.8 million.[2] In 2007, more than 16 000 patients were admitted to hospitals with TBI,[3] with an average length of stay of 6.1 days in acute care, 64.2 days in rehabilitation and 84.1 days in other care. These patients characteristically have multiple disabilities and, in addition to health care services, they frequently receive other disability support services (eg, case management, individual therapy support, life skills development).

Many factors affecting outcomes after TBI are modifiable, and influenced by medical management. Multidisciplinary assessments early in the course of the disease guide medical care and provide predictive information about the potential for recovery. Rehabilitation interventions have documented benefit in patients with TBI.[4] Research into rehabilitation in severe TBI is challenging because of: the heterogenous manifestations of sequelae of severe TBI; the unpredictable course of the disease; the range and variety of rehabilitation services; and inconsistent use of appropriate outcome measures.[4] Few studies tackle long-term outcomes in this population, so evidence is insufficient for establishing optimum integrated care, agreement on a minimum clinical dataset for effective communication between clinicians, and incorporation of patient and caregiver perspectives.

The multicentre study by Baguley and colleagues in this issue of the Journal[5] adds clarity by describing the long-term mortality pattern in adults with severe TBI, and identifies the risk factors associated with mortality. Among their 2545 patients with severe TBI discharged from tertiary rehabilitation units of the New South Wales Brain Injury Rehabilitation Program, with a mean follow-up period of 10 years, there were 258 recorded deaths. The authors report an increased risk of death up to 8 years after discharge from rehabilitation services that was 3.2 times greater than that for the general population, and higher than rates in previous reports (range of long-term mortality estimates, 1.1–3.1).[6] The mortality rates remained higher than for the general population for up to 5 years after discharge from rehabilitation. True mortality rates may be underestimated; similar data for late mortality after TBI in children and Indigenous people are needed. The findings of Baguley and colleagues have implications for health service use and health modelling.

The study by Baguley et al is the first long-term mortality report of Australian data, and shows an increased risk of death among patients with more severe TBI, greater functional dependence, previous drug and alcohol misuse, epilepsy before their TBI and older age at injury; these findings are consistent with those of other studies.[7,8] Compared with the general population, those with severe TBI had a particularly high risk of death from respiratory disorders, and a high risk of death from nervous system, mental and behavioural, and digestive disorders. Discharge to an aged care facility was identified as a risk factor independent of functional dependency at discharge from rehabilitation, and needs further investigation. Older patients are considered at risk because of an altered pathophysiological response in the ageing central nervous system. Further, health, lifestyle and social deprivation have been linked with survival.[9] Other reports suggest that TBI itself provokes lifestyle and behavioural changes, or defines a subgroup in the population at higher risk of death for other reasons.[7] Future research should target interventions for general preventive measures to maintain health, and social and lifestyle changes in people discharged to the community after a TBI.[7]

The important elements of service provision for patients with TBI are similar to those in other conditions requiring neurorehabilitation:[10]

- involvement and support of primary health practitioners;
- education of doctors, patients and caregivers about mortality, declining health and high-risk behaviours for targeted intervention;
- clinical guidelines to include routine postdischarge follow-up over a longer time, and a flexible health care delivery system that prioritises the rehabilitation needs of patients with TBI; and
- a clear plan of action and compliance, including indications for referral to specialised multidisciplinary services.

Policy recommendations to establish services for continuity of care (acute to subacute and community care) for patients with TBI include:[4,10,11]

- develop rehabilitation services (including infrastructure and personnel) for patients with severe TBI;

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- provide services to meet the complex needs of those with severe TBI, to identify unmet needs for assistance and reduce reliance on informal assistance;
- link TBI rehabilitation programs with the existing Australian Rehabilitation Outcomes Centre dataset for long-term collection of clinical data, using standardised common data elements;
- computerise national monitoring systems in real-time to document mortality and morbidity in TBI, and monitor patterns of recovery;
- review policy and implement rigorous assessment of the impact of quality care to decrease mortality rates and harm from ineffective or insufficient treatment;
- expand national insurance schemes to fund non-compensatable TBI rehabilitation; and
- maintain a sustained public health information campaign to publicise issues and promote strategies for implementation in patients with TBI.

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