Preventing suicide after traumatic brain injury: implications for general practice

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ABSTRACT

- People with traumatic brain injury (TBI) have an increased risk of suicide, suicide attempts and suicide ideation compared with the general population.
- Most suicide deaths and attempts involve self-poisoning.
- General practitioners are strategically placed to make a significant contribution to preventing suicide in this group.
- Assessment approaches need to take into account the chronic nature of suicide risk in people with TBI. The assessment of post-TBI depression is complicated by the confounding effect of post-TBI motor–sensory and cognitive impairments, but psychological symptoms (feelings of hopelessness, worthlessness, and anhedonia, in particular) suggest the diagnosis of depression after TBI.
- Management includes close attention to how medications are prescribed, dispensed and administered. Family and community brain injury agencies can be enlisted to provide emotional support and monitoring of people with TBI.
- GPs can facilitate access to needed mental health services for people with TBI during times of suicidal crisis.
- *Clinical practice guidelines for the care of people living with traumatic brain injury in the community*, recently published for general practice, may be of use in managing people with TBI (http://www.maa.nsw.gov.au/default.aspx?MenuID=188).

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Traumatic brain injury (TBI) has an estimated prevalence of 5.7% in the Australian population,[1] and is associated with an annualised incidence rate of hospital admissions of about 126 per 100 000 population.[2] The major causes of TBI are road crashes, falls, sporting injuries and assaults.[2] Concussion or mild injuries comprise up to 80% of all traumatic brain injuries, and about 15% of those affected will report persisting sequelae from their injuries.[3] By contrast, very few people who have a severe TBI will remain unscathed, with the great majority experiencing some degree of permanent impairment and life change.[4] The sequelae of TBI span neurological (eg, motor, sensory and autonomic), cognitive (eg, memory, problem-solving) and personality/behavioural (eg, emotional control, impulsivity, aggression) domains.[4] These impairments often have negative effects on key areas of people's lives, such as occupation, relationships and independent living.

Prevalence of suicidality

Several recent population-based studies have reported an elevated risk of death by suicide,[5] suicide attempts[6] and suicide ideation[1] among people with TBI. People with severe TBI are four times more likely to commit suicide compared with the general population,[5] and people with mild injuries (ie, concussion) also have an elevated risk of suicide (standardised mortality ratio of 3).[5] Epidemiological research in the United States found that people with TBI (all severity levels) had an 8% lifetime rate of suicide attempts, compared with 2% for the population as a whole.[6] Furthermore, rates of clinically significant current suicide ideation of around 22%[7] have been reported.

Clinical features of suicide and suicide attempts

The clinical features of suicide after severe TBI include a history of post-injury suicide attempts in a significant proportion of people who subsequently actually completed suicide.[8,9] Suicide ideation has also been prominent in the months preceding the deaths.[8,9] Most suicides are characterised by signs of premeditation (eg, thinking of ways to end one's own life), and preceded by chronic periods of suicidality. Self-poisoning has been the most frequent cause of death,[9] although people with TBI have employed a diverse range of methods to commit suicide.[8]

Some clinical features of suicide attempts after severe TBI have also been described in an Australian cohort;[10] 62.5% of the attempts involved self-poisoning, which is not surprising given that up to 80% of people with TBI use medication.[11] Over a quarter of the people who had made a post-injury suicide attempt went on to make at least one more attempt within 12 months of the index attempt; two-thirds of people who made a repeat attempt or attempts used more than one method.[10]

Risk factors

While people with severe TBI have a higher risk of suicide than those with concussion, rates of suicide after concussion are still surprisingly high. One explanation is that premorbid or concomitant characteristics such as substance misuse, psychiatric illness, or aggressive personality traits increase the risk for concussion, and may be more significant in the subsequent suicides than the brain damage per se.[5] For severe injuries, it is more likely that the pattern of neuropathology, residual adaptive abilities, psychological reactions to the injury, and the presence of psychiatric disorders play a significant role.[5]

At any severity of injury, comorbid substance misuse problems increased the risk of suicide for both males and females.[5] Next, people who sustained a TBI by an act of self-harm were seven times more likely to die by suicide after TBI, compared with people whose TBI was not caused by self-harm.[5] However, only 0.7% of people with TBI are injured as the result of self-harm, so this risk factor applies to only a small subset of people with TBI.

For patients with severe injuries, the risk of suicide attempts is increased if they have more than one comorbid disorder. People with a post-TBI history of emotional distress and substance misuse were 21 times more likely to have made a post-TBI suicide attempt compared with people with TBI who had no post-injury history of psychopathology.[10] Finally, people with strong suicide ideation were five times more likely to have made a post-TBI suicide attempt.[7]

More generally, affective disorders such as depression and anxiety are widespread after TBI (eg, a 27% rate of major

1 Warning signs to assist screening for suicide risk in patients with traumatic brain injury (TBI)*

Warning signs	Examples/manifestations
Depression/hopelessness	Self-reported symptoms of depression or hopelessness (eg, "sick of being the way that I was", "wish life had ended at the accident")
Relationship conflict	Arguments with family or friends (eg, "having an argument with my mother and she slapped my face")
Relationship breakdown	Relationship separation or cessation (eg, "my wife decided to separate and took the children")
Instrumental difficulties	Work difficulties, lack of finances, legal problems
Social isolation	Having no friends, loss of friends, death of someone close
Pressure of multiple stressors	Salient feature was an overwhelming experience of pressure, which could be specific (ie, from specific multiple causes including some combination of the circumstances from this list), or non-specific
Global impact of injury	Non-specific global reference to the TBI or impact of TBI (eg, "nothing can be done to treat the brain injury")

* Information can be elicited indirectly by inquiring about the progress of recovery from the TBI, or directly (eg, "Given your current difficulties/current distress, have you had any thoughts about harming yourself?"). ◆

depression[12]). The assessment and treatment of such disorders is an important clinical priority in its own right. As expected, studies have reported an association between post-TBI depression and suicide,[9] suicide attempts[10] and suicide ideation,[10,13] but methodological limitations of those studies mean that definitive degrees of risk are yet to be established.

Relevance to general practice

General practitioners play several important roles in the continuum of care for people with TBI. These include medical management of common chronic post-TBI health conditions,[11] monitoring and arranging treatment for behavioural and mood-related disturbances, facilitating social reintegration and return to work, as well as supporting family caregivers.[4] The long-term nature of such roles was demonstrated in an Australian study of service use, which found that 43%–59% of people with TBI (119 patients at 6 months to17 years post-injury) had consulted a GP in relation to their TBI within the previous 12 months, averaging seven such visits during the year.[14]

GPs are therefore strategically placed to make an important contribution to suicide prevention for people with TBI. This is consistent with the broader role that GPs play in suicide prevention,[15] with the primary care network being indispensable in Australia's national suicide prevention efforts.[16] In particular, the literature suggests that GPs are well situated to detect people at risk of suicide; provide management and support during periods of suicidal distress; and play a role in the diagnosis and treatment of patients with mental health problems.[15-17]

Assessment and management of suicidality after traumatic brain injury

The elevated levels of suicidality after TBI highlight the need for an active approach to prevention. Yet, there are no diagnostic-specific evidence-based data to guide assessment and management options. The approaches described below apply to all levels of injury severity and are based on: (i) extrapolation from the broader knowledge base about suicide prevention; (ii) current best practice in treating underlying mental health disorders after TBI; and (iii) drawing out clinical implications from the research findings on suicidality after TBI.

Detection and assessment

There are three underlying considerations in detecting suicide risk in people with TBI. First, in line with the broader experience in general practice,[17] most people with TBI are likely to present for medical reasons, and concurrent psychological distress or suicide ideation may not be disclosed. Second, the risk of distress does not diminish over time regardless of the severity of injury, with an elevated risk of suicide persisting for at least 15 years,[5] and elevated suicide ideation up to 33 years after TBI.[1] Third, the sex-related patterns of suicidal behaviour observed in the general population do not apply to people with TBI. One study found that females with TBI had a higher risk of death by suicide than males.[5] Another found that an equal proportion of males and females attempted suicide post-injury.[7] This contrasts with the usual experience in general practice settings, where females are more likely to have a history of suicide attempts than males.[18]

Box 1 provides an outline of various psychopathological or psychosocial indicators that can be warning signs of elevated risk, and may help to detect people experiencing suicidal distress. The data were elicited from interviews with 45 outpatients with severe TBI who were asked to describe the antecedent circumstances to their suicide attempts.[10]

In the case of expressed suicidality (eg, suicidal thoughts, an act of deliberate self-harm), a detailed suicide risk assessment is warranted. This involves evaluating the frequency and strength of suicidal thoughts, the presence of a plan to commit suicide, and any history of self-harm; a mini-mental state examination;[19] and the identification of suicide risk factors (such as those outlined in the previous section).[20] Given the characteristic impairments in insight and memory after TBI,[4] family members and brain injury support service staff are useful sources of information about the history and current state of the person with TBI.

In determining whether there is associated depression, a number of the motor-sensory (eg, psychomotor slowing) and cognitive (eg, reduced concentration) impairments secondary to TBI overlap with the vegetative and cognitive symptoms of depression, creating the danger of over-diagnosing post-TBI affective disorders.[3] Reports of feelings of hopelessness, worthlessness, and anhedonia are most likely to identify patients with TBI who also have depression.[3]

Support and management of patients exhibiting suicidality

Box 2 provides details of general suicide prevention strategies that can be applied to people with TBI generally, as well as more specific options for people with TBI who are in "at-risk" groups, or who have expressed some level of suicidality. Once suicidality has been identified, GPs have been called on in an advisory role, or,

2 Suicide prevention strategies for general practitioners managing patients with traumatic brain injury (TBI)*

Level of intervention	Clinical management
Universal	
All people with TBI	• Assess hopelessness and suicide ideation proactively, using indirect or direct approaches • Monitor for warning signs that may increase risk level • Recognise that people may be at risk regardless of time post-injury • Make provision for the availability of long-term support • Monitor males and females equally
Selected	
People with TBI in "at-risk" groups	• Treat people with depressive or substance misuse conditions • Monitor people with comorbid psychiatric conditions and those injured as the result of a suicide attempt
Indicated	
People with TBI for whom suicide is an identified issue (eg, made attempt, expressed suicide ideation)	• Reduce the lethality of the environment • Provide frontline treatments (pharmacotherapy) • In managing someone with a history of any attempts, plan for the possibility that people may use more than one method • Provide support/monitor for at least 12 months after a suicide attempt • Closely monitor in the months after discharge from a psychiatric hospital

* Adapted from the United States Institute of Medicine generic suicide prevention model.[21] ◆

sometimes, to intervene more directly. In the case of a suicide crisis for which a voluntary or involuntary admission to hospital is required, local community-based brain injury agencies or families often need medical support to gain access to required mental health services. Such admissions may only provide a temporary solution, however, as a number of suicide deaths among people with TBI occurred within 3 months of discharge from inpatient psychiatric facilities.[8,9]

For outpatient management, reducing the level of lethality of the immediate environment of the person with TBI (eg, removing guns) is an important consideration, because this is one area of suicide prevention that has evidence of efficacy.[22] Given the high proportion of people with TBI who are taking some form of medication, identifying the safest approach for prescribing, dispensing and administering medications is a priority. Family members and/or support services can help in addressing lethality issues.

Increasing the levels of social support and monitoring is important during crisis periods, particularly for patients recently discharged from psychiatric care for suicidality, or those who have made a recent suicide attempt. Family members and community brain injury agencies can be enlisted to undertake a range of activities, acting as a source of emotional support to the person with TBI, an early warning system if the suicidality is intensifying, as well as a conduit of care (eg, supervising medication, ensuring the person with TBI attends appointments). Increased support can include increased visits and phone contact by the family or brain injury services, or organising a temporary change of accommodation (eg, the person with moving back in with family). This approach also fits in with the expressed wish of people with TBI to have relatives and brain injury services play a role in suicide prevention.[23]

All Australian states have major brain injury rehabilitation units that are a source of additional information or specialist review. State brain injury associations also supply information about community brain injury services that may be able to provide intervention or support (details for the state associations can be found on the Brain Injury Australia website, http://www.braininjuryaustralia.org.au).

Treatment of mental health problems

The association between TBI and psychiatric symptoms and disorders has been extensively documented.[1,6] Proactive management of mental health problems is an important clinical priority in its own right, as well as forming a strategic component of suicide prevention efforts. *Clinical practice guidelines for the care of people living with traumatic brain injury in the community* have recently been published for GPs.[3] The guidelines report initial evidence for the efficacy of desipramine for treating depression, although harmful side effects are reported for some cases.[3] Sertraline may constitute a less harmful alternative, with the one study of this drug conducted to date reporting a reduction in depressive symptoms. No trials have yet been conducted that evaluate the efficacy of cognitive behaviour therapy (CBT) as a frontline or conjoint treatment for depression after TBI, but case studies illustrating the use of CBT for depression have been reported.[24] Evidence for the management of post-injury anxiety, schizophrenia and aggressive behaviours is also addressed in the guidelines.

Conclusions

General practice plays an important role in the long-term support of people with TBI and their reintegration into the community. Working in partnership with families and broader brain injury service networks, GPs can make an important contribution to the challenge of suicide prevention.

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Competing interests

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