Geriatric Psychiatry

Traumatic Brain Injury in Older Adults: Relevance to Psychiatrists

Mark Rapoport, MD, FRCPC
Geriatric Psychiatrist, Sunnybrook and Women's College Health Sciences Centre, Toronto, Ontario

Abstract: Although traumatic brain injury (TBI) is generally seen as a problem of young adults, the elderly are particularly vulnerable to this injury and account for almost one-half of hospital admissions for fall-related TBI. This paper highlights, through the use of a case presentation, the problems related to TBI in older persons, focusing on the neuropsychiatric sequelae, including postconcussive symptoms, mood disturbance, cognitive impairment and dementia.

Résumé : Traumatisme cérébral chez les adultes âgés : pertinence pour les psychiatres
Bien que le traumatisme cérébral (TC) soit généralement perçu comme étant un problème chez les jeunes adultes, les personnes âgées y sont particulièrement vulnérables et représentent près de la moitié des hospitalisations pour TC lié à une chute. Cet article énumère, à l'aide d'une présentation de cas, les problèmes liés au TC chez les personnes âgées, en soulignant les séquelles neuropsychiatriques, dont les symptômes postcommotionnels, la perturbation de l'humeur, la déficience intellectuelle et la démence.

Key Words: traumatic brain injury, geriatric neuropsychiatry

According to the Ontario Brain Injury Association, every year 50,000 Canadians and 16,000 Ontario residents sustain a traumatic brain injury (TBI) (1). There is a bimodal distribution of TBI across the age groups, with a second peak in incidence in older adulthood. Recent data suggest that, in Ontario, falls are more common causes of TBI than are motor vehicle accidents (2,3). Of all head injury hospitalizations caused by falls, 42 per cent of the patients were aged 65 years and over (3). Most TBI in the elderly is of mild severity; however over the last two decades, there has been an increased incidence of fall-induced severe head injury in older adults in Finland (4) and in the United States (5). While increasing public health effort has aimed to reduce falls in the elderly, little attention has been paid to the neuropsychiatric and functional outcomes of TBI in this population.

Psychiatrists are often presented with patients who have a new onset of mental illness in old age. Commonly, these disorders are associated with underlying neurological illnesses (6,7), and it becomes an important challenge to understand the degree to which the underlying neurological disorder impacts on the clinical syndrome. TBI is salient, because it is a common occurrence in older people, and neuropsychiatric illness serves both as a predictor of and a consequence of TBI.

Classification
Mr. C. is a 72-year-old retired lawyer. One year ago, he was a passenger in a car driven by his wife. Their car was struck by another car, and his wife was killed. His head struck the windshield, leaving him unconscious for five minutes. At the scene, the ambulance attendants found him to be disoriented and mumbling incoherently, yet he was able to open his eyes spontaneously and move to command. His Glasgow Coma Scale (GCS) score was 13 at the scene and 15 in the ER, where he was seen conversing with staff. He was sent home, but that night he became less responsive and was once again rushed to hospital. This time, his GCS was 10, and his CT scan showed a small frontal subdural hematoma. This was managed conservatively. He had no recollection of the accident or of his first three days in hospital.

Physicians and the lay press often describe TBI severity according to its long-term consequences. By convention, however, TBI severity is clinically coded according to the initial severity of the injury to the brain, based on the impact at the scene and on the short-term period that follows. Mild TBI is defined as a loss or alteration of consciousness for 30 minutes or less at the time of injury, an initial GCS of 13 to 15 and posttraumatic amnesia (PTA) of less than 24 hours (8).

Mr. C. initially seemed to have had a mild TBI. That night, however, he deteriorated in alertness, and a subdural hematoma had evolved. His injury would be reclassified as a moderate one.

Sequelae of TBI: Disability and Postconcussive Symptoms
One year after his accident, Mr. C. presented to the clinic’s office for the first time. He and his son reported that he was previously well with no past or family psychiatric history. A nondrinker and nonsmoker, he complained of inability to do his work (he had a small business after retirement) or to play...
bridge. He was preoccupied with never-ceasing headaches, tinnitus and difficulty concentrating.

Postconcussion symptoms, such as persisting headache, dizziness, fatigue, cognitive difficulties and depression are present in up to 40 per cent of patients following mild-to-moderate TBI (9). After mild trauma, these symptoms generally resolve by six months, but they can continue in some patients for years after the injury. Although older adults are less likely than those who are younger to be employed at the time of injury, they can experience profound disruption of their avocational activities and relationships.

It has been well established that older patients with severe TBI fare worse than do younger patients, with high rates of significant disability and mortality (10–15). Several studies have shown, however, that this may be true even after mild TBI (11,16,17). Conversely, in a small prospective clinical study of mild TBI, older adults had significantly less severe postconcussive symptomatology and better psychosocial outcome than did younger patients in the acute period following their injury (18).

**Major Depression and TBI**

*Mr. C. stated that, since his accident, in addition to his physical symptoms, he had been unable to enjoy life and felt sad all the time. He felt hopeless about getting better, particularly given the length of time that had lapsed since his injury. He stated that he would rather be dead and join his wife than suffer as he was but denied thoughts of taking his own life.*

Major depression is a relatively common TBI complication, with a point prevalence of between 14 and 29 per cent (16,19–22). The incidence of suicide among patients with TBI is between 2.7 and 4.1 per cent higher than in the general population (23). Old age is not necessarily a risk factor for the development of major depression post-TBI. In two studies, major depression (18) and psychiatric disorders as a whole (16) have been seen less commonly in older patients than in younger patients following TBI, although one study found that depression increases with age at injury (24). Nonetheless, major depression has been consistently associated with poor psychosocial functioning and with postconcussive symptoms following TBI in younger populations (19,20,22,25). Likewise, because there is abundant evidence for high morbidity of depression in the elderly, this is likely the case in older persons post-TBI.

The challenge for Mr. C.’s clinician was to distinguish between the physiological postconcussive symptoms, bereavement and a mood disorder secondary to TBI. Given the absence of a past or a family history of mood disorder, a primary major depressive disorder seemed unlikely.

Although clinical experience suggests that selective serotonin reuptake inhibitors (SSRIs) are useful in treating major depression following TBI (26), studies to date are limited to three open-label studies (27–29) and one small controlled study (30). In the controlled study (30), subjects reported improvement in social, family and work functioning, as well as in postconcussive symptoms, after eight weeks of sertraline. No studies have focused on response to antidepressants following TBI in the elderly.

**Cognition and TBI**

*On his mental status examination, Mr. C. was tearful, with a restricted range of affect. He also had impairment in attention, memory and problem-solving abilities.*

Cognitive sequelae following TBI typically contribute more to persisting disability than to physical impairment (31). Little is known, however, of how TBI impacts cognition in the elderly. An initial study by Mazzucchi and others found that just over one-half of the sample had evidence of severe cognitive deterioration 10 months following injury (32). Subsequently, there have been several small studies showing that post-TBI, older people have impairment in language, memory and executive functioning (33,34). Other studies, however, have shown either that this is true only for those with moderate TBI (35) or that older patients with mild-to-moderate TBI do not differ cognitively from orthopedic control subjects (10).

The psychiatrist had to determine to what extent Mr. C.’s cognitive deficits were due to neurological impairment from the injury and to his emotional distress and whether judicious trial of an antidepressant might improve his cognition (36).

**TBI and Dementia**

*One year after the first visit, rather than the usual improvement in cognition following TBI, Mr. C. showed a decline on his Mini-Mental State Examination (MMSE), from 26 to 22. He was unable to manage his finances and had forgotten twice to turn off the stove.*

TBI has been seen as a risk factor for Alzheimer’s disease (AD) in epidemiologic studies (37), but results have been mixed (38). There is potential overlap in pathology between TBI and AD, with beta amyloid deposition present in both conditions (39), and the epsilon 4 allele of apolipoprotein E has been implicated as a mediating factor (40–46).

The clinician must distinguish between a dementia, owing to the direct effects of the brain trauma, and the incipient AD precipitated by the TBI. Dementia because of TBI is generally seen as a static condition with sudden onset, whereas AD is a gradually progressive dementia with insidious onset. The MMSE is generally insensitive to the cognitive deficits following TBI, unless the patient has developed a dementia. Thus, it is crucial that collateral history be obtained to rule out the presence of a dementia that was subtly present prior to the injury; patients...
with dementia are more likely to have a TBI than those without dementia.

Although some open-label studies have suggested that the use of cholinesterase inhibitors in patients with TBI and cognitive impairment helps (47), controlled data are lacking, is evidence for their use in the elderly.

Conclusions

TBI is common in Canada, and with an aging population, the incidence will likely increase in the coming years. Although severe injuries are associated with high rates of disability and mortality in the elderly, little attention has been paid to the significant neurobehavioural sequelae that occur even following the more common mild and moderate injuries. So far, the evidence that links older age with poor outcome following these injuries, and that linking TBI with dementia in old age, is confusing and contradictory, making further prospective research necessary to clarify these matters. Clinicians must re-evaluate the general notion that TBI inevitably leads to substantial disability in the elderly, while at the same time maintaining vigilance for the presence of mood symptoms, cognitive deficits and psychosocial disability following these injuries.

Funding and Support

Dr. Rapoport is supported by an operating grant from the Ontario Neurotrauma Foundation.

Acknowledgement

I thank Andrea Phillips for assistance with the manuscript. The conclusions are mine.

References


Geriatric Psychiatry continued on page 27
Social Phobia


Specific Phobias


Video Resources


To view a more comprehensive resource list, please go to www.cpa-apc.org/Publications/Archives/Bulletin/2003/august/antony.asp or visit www.martinantony.com

Geriatric Psychiatry continued from page 24

Residents continued from page 21

References