

Prevalence of Psychiatric Disorders Following Brain Injury

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Abstract

Brain injury is a major cause of mortality and morbidity all over the world and in Europe there is an estimated incidence of 235 brain injury inpatients per 100,000 population. Over the years, the medical care of brain injuries has developed with a resultant fall in mortality. However, with this fall in death rates the proportions of people with complications, especially the neuro-behavioural effects of brain injury, has risen. Of the complications, psychiatric disorders have a significant impact on the patient's quality of life and rehabilitation prognosis and so are an important consideration from both a care delivery and public health perspective. This paper analyses current literature, demonstrating a high prevalence of psychiatric disorders amongst this patient group. It also demonstrates the significant impact they have on patients, carers and families through an insightful case series.

Introduction

Brain injury is a major cause of mortality and morbidity all over the world and in Europe there is an estimated incidence of 235 brain injury inpatients per 100,000 population¹. Over the years, the medical care of brain injuries has developed with a resultant fall in mortality. However, with this fall in death rates the proportions of people with complications, especially the neuro-behavioural effects of brain injury, has risen². Of the complications, psychiatric disorders have a significant impact on the patient's quality of life and rehabilitation prognosis³ and so are an important consideration from both a care delivery and public health perspective. This paper therefore aims to analyse the prevalence of psychiatric disorders following brain injury and highlight the practical and personal implications of these through an illustrative case series.

Depression Following Brain Injury

Jorge et al in 2004⁴ conducted a prospective case controlled study on a sample of 91 patients with traumatic brain injury (TBI). Patients with penetrating head injury, spinal cord injury and severe deficits of comprehension was excluded and 27 patients without brain injury but with other trauma was included as controls. The sample was analysed at 3, 6 and 12 months with Present State Examination (PSE), structured clinical interview for DSM-IV, and analysed with Mann Whitney and chi squared tests. The results showed that 33% of the TBI group had major depression compared to 22% in the control group. Neuropsychological testing also demonstrated that depressed patients had a greater degree of impaired cognitive function. An earlier study with a larger sample was conducted by Kreutzer in 2001⁵, studying 722 TBI patients (average time post injury for evaluation 2.5 years). Data was collected via survey, using the Neurobehavioral Functioning Inventory to identify depression; the response was studied by trained neuropsychologists and compared with DSM-IV

Criterion for depression. A significant proportion (42%) of survey respondents met the DSM-IV criterion for depression. Fatigue, low concentration and frustration were most commonly reported symptoms. A similar study done by Seel et al in 2003⁶, where 666 TBI outpatients from 17 centres was reviewed using DSM-IV Criterion, showed rates of major depression to be 27%.

Mania Following Brain Injury

Jorge in 1993⁷ reviewed 66 patients with brain injury at 3, 6 and 12 month intervals to evaluate the prevalence of mania. The inclusion criteria was age above 18 years and absence of delirium, no previous history of mood disorder and absence of grave injuries to other areas of the body. Using the Present State Examination to gather data, 9% of the sample had symptoms in correlation with the DSM III criteria for mania.

Van Reekum in 1996⁸ recruited 18 TBI patients attached to a rehabilitation unit for a study to evaluate mental illness in this population. 44% of patients had severe TBI while 56% had mild/moderate TBI; the average duration since TBI was 4.9 years. 27% met the DSM II criteria for bipolar affective disorder and 61% met criteria for depressive illness. The rate of anxiety disorder was 38% but psychosis was not reported.

Psychosis & Other Mental Illness Following Brain Injury

Fann et al in 2004⁹ conducted a large prospective cohort study involving 1939 randomly selected TBI patients 1 year pre injury and 3 years post injury to study rates of psychiatric illness including psychosis. The sample was divided into the moderate/severe TBI and mild TBI compared to matched controls. The presence of psychiatric illness was detected by utilisation of mental health services by subjects, usage of psychotropic medication and presence of a psychiatric diagnosis in the records. Psychotic disorders were seen in 49% of the moderate to severe TBI patient group and for the mild TBI

group psychosis was seen in 34% of the sample. This is significantly greater than the rate seen in the control group. However the lack of definitive diagnostic criteria and confounding factors such as social circumstances and other physical health issues which may have strong associations with mental illness were not accounted for.

Another observational prospective study done by Rao et al in 2009¹⁰ looked into prevalence rates of aggression in the 3 months following brain injury. Overt Aggression Scale was used by trained examiners in the assessment of aggression in a sample of 107 TBI patients. Comorbidities were analysed using General Medical Health Rating scale; psychosocial functioning was analysed by Social Functioning Exam and the Social Ties Checklist. Results showed the prevalence of aggression in the sample to be 28.4% and this subgroup was also associated with new-onset major depression. Only 63% of the already small sample completed the study and the drop out group was unaccounted for; this may negatively impact the results.

Keenan et al in 2008¹¹ studied prevalence of attention-deficit hyperactivity disorder (ADHD) in 2782 post TBI children and demonstrated chance of a diagnosis of ADHD two folds higher amongst children with a head injury before age 2. Jellinger in 2004¹² studied links between brain injury and dementia, and found that although cognitive deficit was associated with brain injury, there was no established link between development of dementia and brain injury. Oquendo et al in 2004¹³ studied 325 depressed patients to analyse the link with mild TBI and suicidal behaviour; 44% of the sample had mild TBI and suicidal behaviour was more common in this subgroup. Suicide Intent Scale and the Lethality Rating Scale was used to measure suicidal behaviour. However, exclusion of moderate to severe TBI and inclusion of only inpatients in this study would affect any generalisability of the results.

Case series: Psychiatric Disorders Following Brain Injury

Case 1- Patient A: Epilepsy, interictal psychosis and organic personality disorder following head injury

Patient A is a 37 year old female under mental health services with a diagnosis of organic personality disorder and interictal psychosis. She suffered from epilepsy from the age of 9 but coped well at school and went on to work successfully as a hairdresser. However, in 1998 at the age of 22 she was admitted to ITU with status epilepticus as a result of encephalitis of unknown cause, and remained severely unwell for several months. She recovered but was left with residual tonic clonic and complex partial seizures.

Since this episode, marked changes in her personality were noted. She developed mood swings with recurrent episodes of low mood, and expressed paranoid beliefs about people in the street talking about her. These beliefs resulted in her being agitated and physically aggressive, resulting in harm to both herself and others. She has required numerous admissions to

acute wards and rehabilitation units because of her paranoid and suspicious behaviour and aggressive outbursts that her family were not able to manage in the community. She required restraint under Section 3 of the Mental Health Act in 2010, believing that care staff were poisoning her. Psychotic symptoms are most marked around seizures, with her displaying self-harming behaviour such as cutting off hair or painting face with nail polish. She frequently accuses staff and family of acting against her in these periods and her behaviour is very difficult to manage.

Her case has been challenging to manage successfully in the community by family and community teams, and she has needed several short and long term stays in acute wards and residential units. Her care has been coordinated jointly between neurological and psychiatric services. She currently lives with her parents and has carers to support her. Her epilepsy is yet to be successfully controlled; antipsychotics can lower the seizure threshold and so a delicate balance between these and her antiepileptic medication is warranted. There is an on-going concern that further mental health problems may develop in light of this.

Case 2- Patient B: Schizophrenia following head injury

Patient B is a 43 year old female with a diagnosis of schizophrenia, learning difficulties and epilepsy. She suffers from epilepsy in the form of absence and tonic-clonic seizures from the age of 7 months, when there is high suspicion that she sustained a head injury whilst in the care of extended family. Patient B has difficulties with numeracy and literacy, identified through psychological assessment, and an IQ of around 70. She has required three admissions under Section 2 of the MHA due to her paranoid delusions and poor self-care. Patient B frequently reports feeling monitored by cameras, suspicions that her food has been poisoned and that her personal belongings are being tampered with. She has attempted to take her own life due to feeling unable to cope with these delusions, laying in the road to be run over by a bus.

She is currently managed well in the community on oral risperidone for her psychosis and sodium valproate for her epilepsy; she resides in supported accommodation and has required stints in long term residential and rehabilitation beds due to her mental health problems and learning difficulties.

Case 3- Patient C: Depression and Personality disorder after head injury

Patient C first came in to contact with psychiatric services in 2007 and was diagnosed with depression and organic personality disorder. At the age of 16 this gentleman was knocked off his bicycle and sustained a severe head injury, from which he was left in a coma for over three weeks, but recovered well enough to go home. In 1994 he started having blackouts, was investigated extensively by neurology, and diagnosed with

non-epileptic attack disorder. As part of these investigations, Patient C underwent an MRI which demonstrated significant brain damage including traumatic damage to the frontal lobes. This was likely due to his accident at age 16. From his first assessment by psychiatric services, he eluded to thoughts and behaviours that were of serious concern to his team. He reported feeling emotionally detached from his family, gaining little pleasure from life, getting in to fights frequently and allegedly having stabbed someone in an altercation several years ago. He described to practitioners only getting excitement out of reading and watching programmes about serial killers, and occasionally became sexually aroused by this. He had made extensive written plans on how he would capture, torture and kill the couple he believed were responsible for his accident at 16. He also struggles with auditory command hallucinations telling him to harm himself and others. He frequently self harms, often using a Stanley knife to cut his arms and legs. Patient C has been jointly managed by adult psychiatry and neuropsychiatry on an outpatient basis. His risks of aggression and violence have been carefully managed through regular assessment and involvement of forensic services.

Conclusion:

The literature search indicates that the prevalence of psychiatric disorders in patients with brain injury is much higher compared to general population. The significance of the results are however greatly affected by response bias, the impact of patients' cognitive impairment on their study participation, observer biases and the small study population sizes; however, we believe that these short-fallings should be seen as a trigger to stimulate more comprehensive and wide-scale research in to this field. The methodologies used by authors described in the literature review demonstrate the wide variance in the tools used to assess psychiatric illness in patients following TBI; we therefore argue that universal case definitions need to be agreed on and implemented to standardise studies and reduce bias. The economic impacts and impacts on quality of life have often been neglected by researchers and warrant formal assessment. From a service delivery perspective, rehabilitation programs need to identify patients with signs of psychiatric illness post TBI earlier and involve psychiatric service in the development of integrated care plans to improve the total outcome and quality of life of the patient. The impact on the patient's family and carers also need to be explored further to provide an evidence base for more effective and holistic interventions.

Competing Interests

None declared

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