

# Psychiatric sequelae of traumatic brain injury: Retrospective analysis of 75 subjects from Kaduna, Nigeria

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## Abstract

**Objective:** Traumatic brain injury (TBI) is a public health problem and is associated with many complications. However little is known about the psychiatric sequelae of TBI in Nigeria. This study described the pattern and determinants of psychiatric sequelae among subjects with TBI.

**Materials and Methods:** The study is a retrospective review of cases of subjects referred to Federal Neuropsychiatric Hospital, Kaduna on account of TBI or its complications from 2001 to 2008. Information obtained included the socio-demographic characteristics, type of injury, durations of unconsciousness (LOC) and posttraumatic amnesia (PTA), psychiatric and psychoactive substance use history. Psychiatric diagnosis was based on the criteria of the 10th edition of the International Classification of Diseases (ICD-10)

**Results:** Mean age of the subjects was  $32.2 \pm 35.8$  years, mean duration of unconsciousness was  $6.88 \pm 9.40$  days, mean duration of PTA was  $5.45 \pm 8.78$  days, 90.7% were males, 69.3% had road traffic accident (RTA), 28.0% had psychosis, 25.3% had cognitive impairment while 17.3%, 8.0%, and 6.7% had epilepsy, personality change and depression respectively. About 15% had no complications yet. Only 30.7% did cranial CT scan. Long duration of LOC and PTA were significantly associated with psychiatric complications ( $P$  value  $<0.05$ ).

**Conclusions:** Psychiatric sequelae are common after TBI. Long periods of LOC and PTA are predictive of such sequelae. Efforts should be made to prevent RTA, communal clashes and other activities that can lead to TBI.

**Key words:** Brain, Nigeria, psychiatric, sequelae, trauma

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## Introduction

Traumatic brain injury (TBI) is a significant public health concern.<sup>[1]</sup> It can result from physical trauma to the head, and its outcome is fairly dependent on the severity of the injury, especially for the moderate and severe categories. Thus, a subject with TBI may present with subtle deficit or severe intellectual and emotional disturbances.<sup>[2]</sup>

The neuropsychiatric complications of TBI may include psychosis,<sup>[3]</sup> mood disorder-depression, mania or bipolar,<sup>[4]</sup> and other neuropsychiatric disorders such as personality

changes, seizure disorder, cognitive impairment, and substance use disorders.<sup>[5-7]</sup>

Studies conducted among survivors of TBI have identified several risk factors for psychiatric complications. These include increasing age, prolonged period of unconsciousness (LOC),<sup>[8]</sup> long posttraumatic amnesia (PTA),<sup>[9]</sup> abnormal premorbid personality, alcoholism,

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poor social support, financial difficulties, previous history of mental illness, and family history of mental illness.<sup>[6,10]</sup>

In Nigeria, previous studies conducted among patients with TBI<sup>[1,11-13]</sup> have focused on the mortality and physical morbidity, and as such, there is paucity of information as regards the psychiatric sequelae of TBI in the country.

The aim of this study, therefore, was to describe the pattern and predictors of psychiatric complications in patients with TBI seen in our center.

### Materials and Methods

This retrospective study was conducted at the Federal Neuropsychiatric Hospital, Kaduna, in the Northwestern part of Nigeria, a tertiary health institution that receives referral, mostly psychiatric and sometimes neurological, from virtually all the northern states of the country.

We retrieved the case files of all the patients referred to the hospital on account of head injury or its complications between 2001 and 2008. We obtained the socio-

demographic characteristics of the subjects, types of accident, duration of unconsciousness, duration of PTA, previous and family history of mental illness, use of psychoactive substances, and premorbid personality from the case files. The psychiatric diagnosis was based on the criteria of ICD-10 and DSM-IV.

The research and ethics committee of Federal Neuropsychiatric Hospital, Kaduna, gave approval

The data obtained were analyzed using the 15<sup>th</sup> edition of the Statistical Package for Social Sciences, setting the significance level at *P* value <0.05

### Results

The mean age of the patients was 32.2 ± 35.8 years, the mean LOC was 6.88 ± 9.4 days, and the mean duration of PTA was 5.45 ± 8.78 days. Majority of the injuries resulted from road traffic accident (RTA). Table 1 shows the details of the socio-demographic and clinical characteristics of the patients.

Approximately 85% of the patients have developed one form of psychiatric disorder or the other. The commonest psychiatric sequel was psychosis.

Further analysis revealed that long LOC ( $X^2$  9.062,  $P=0.011$ ) and PTA ( $X^2$  7.017,  $P=0.030$ ) were significantly associated with psychiatric complications while the socio-demographic and other clinical characteristics were not ( $P>0.05$ ). Multiple regression analysis confirmed that these two clinical variables are predictors of psychiatric complications in patients with TBI (OR 0.1142,  $P=0.08$ , 95% CI 0.034–0.598 and OR 0.159,  $P=0.017$ , 95% CI 0.035–0.721 for LOC and PTA, respectively)

### Discussion

The results of this study show that more than 90% of the patients are males. Previous reports have indicated that more men than women sustained TBI.<sup>[1,2]</sup> One possibility is that men are more adventurous and they take a lot of risks. In addition, psychoactive substance abuse could have contributed to the accidents in some of the subjects, although use of alcohol and cannabis was recorded in only 8% of the patients. The possibility of underreporting should be considered. It is a well-known fact that men use psychoactive substances more than women.<sup>[14]</sup>

Majority of the subjects (58.6%) were within the age range “20–39” years. In some earlier studies from Lagos, Nigeria,<sup>[11]</sup> and Blantyre, Malawi,<sup>[15]</sup> similar observations were made among patients with head injuries. It appears, therefore, that most of the subjects with TBI were in their

Variables	Frequency	Percentage
Sex		
Male	68	90.7
Female	7	9.3
Previous Mental Illness		
Yes	4	5.3
No	71	94.7
Family history of mental illness		
Yes	2	2.7
No	73	97.3
Psychoactive substance use		
Alcohol	4	5.3
Cannabis	2	2.7
Nil	69	92.0
Premorbid personality		
Normal	71	94.7
Maladjusted	4	5.3
CT scan		
Normal	12	16.0
Abnormal	11	14.7
Not done	52	69.3
Duration of loss of consciousness		
24 hours or less	25	33.3
Longer than 24 hours	48	64.0
Missing data	2	2.7
Duration of posttraumatic amnesia		
24 hours or less	20	26.7
Longer than 24 hours	47	62.7
Missing data	8	10.6

productive years when the injuries occurred. This may have some economic implications. This is more so when we consider that after the accidents more than half of our patients became socially and occupationally impaired even after they seemed to have recovered from the immediate effects of the injury.

The commonest cause of TBI in this study was RTA, and this is similar to the findings from earlier studies.<sup>[1,2]</sup> Most patients received initial treatment from hospital. However, neuro-imaging (CT scan) was done by only a third of them. Similar observation was made by Adeleye *et al.*<sup>[1]</sup> This is an essential investigation, which will guide the clinician in making a treatment decision that may be lifesaving and may prevent future complications, both physical and psychiatric. The common psychiatric sequelae of TBI identified from this study are psychosis, cognitive impairment, and seizure disorder. Three of those who had psychosis met diagnostic criteria for manic episode while the rest had schizophrenia/schizophrenia-like disorders. Few patients had more than one complication. All the above disorders have been described by previous researchers.<sup>[3-7]</sup> However, it remains to be determined whether these disorders were caused by the injury or TBI just precipitated the symptoms in people who were already predisposed. A review of the literature by Davison and Bagley<sup>[16]</sup> revealed that most of the patients with post-TBI schizophrenia-like psychosis do not have a family history of schizophrenia. It has also been concluded that TBI seems to make patients particularly susceptible to some psychiatric disorders, and these may develop even decades after the injury.<sup>[17]</sup> In view of the above, it could not be concluded whether those 11 subjects who had no complication at the time of review will remain without symptoms forever.

The absence of association between previous and family history of mental illness and psychiatric sequelae, and use of psychoactive substances and psychiatric sequelae, may have been due to the small numbers of subjects in those categories.

The results of our study confirmed that the duration of LOC and PTA are important factors in the development of psychiatric sequelae following TBI. These parameters have been described as indicators of severity of the injury, and the longer they are, the more severe the injury and the more likely that the patient will develop a complication.<sup>[2]</sup>

### Limitations

This is a retrospective study, and as such, some data were missing, which may have some effects on the outcome of the study. The sample size is also relatively small. In addition, previous and family history of mental illness and use of

psychoactive substance were recorded only in a few patients, making it difficult to test for possible association of these variables with psychiatric sequelae of TBI.

## Conclusion and Recommendations

In spite of the above limitations, the result of this study confirmed that psychiatric complications are common among people who have suffered trauma to the brain and that the durations of unconsciousness and PTA are important predictors of sequelae. In view of the above, a prospective study of patients with TBI should be a focus of future research in Nigeria where data on this subject are limited. We also recommend that all efforts should be made by all stakeholders to prevent accident and trauma to the brain.

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