Study of Psychiatry Morbidity Following Traumatic Long Bone Injury

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Abstract

Background: Limb fractures due to traumatic injury cause pain, prolonged discomfort, loss of function and immobility and are expected to produce adverse psychological effects. However, there is paucity of work regarding psychopathology following bone trauma in India. **Aim:** To evaluate the psychiatric morbidity amongst patients with Traumatic long bone injury (fracture). **Design:** Cross sectional study **Setting:** Dr Vasantrao Pawar Medical College, Nashik- Maharashtra. **Method:** The study was carried out amongst 100 randomly selected patients in the age group of 18- 65 yrs who had sustained long bone injury (fracture). Patients were evaluated 4-6 weeks after the trauma over a period of 18 months. All patients were screened using Mini International Neuropsychiatric Interview version 6.0.0. Statistical Analysis was done using the EPI-INFO software. **Result:** Long bone fracture patients had a high prevalence of Major depressive disorder (23%). Axis I psychiatric diagnosis shows significant association with age, marital status and education. (p< 0.05)The commonest cause of injury was road traffic accidents among males (n=58) and it was statistically significant. (p<0.05). Axis I psychiatric diagnosis was found more in road traffic accidents 18 (54.5%) and individuals with closed and lower limb fracture 26 (78.78%). **Conclusion:** In view of occurrence of psychopathology following long bone trauma. Orthopaedic surgeons need to be aware of these conditions so that they should refer patients for psychiatric evaluation and appropriate treatment.

Keywords: Limb Fractures, Major Depressive Disorder, Road Traffic Accidents.

1. Introduction

Globally, more than 1.5 million persons sustain traumatic physical injuries each year[1]. Traumatic injuries account for nine per cent of the global mortality[2]. Orthopaedic injuries are the most common type of injury, can involve more than one body region, and may require multiple surgical interventions[3].

Following trauma, patients are subjected to dynamic alterations in the hemodynamic, metabolic and immune responses, which are largely orchestrated by endogenous mediators referred to as cytokines[4]. Cytokines have complex interaction on central nervous system and immune system which may lead to neuropsychiatric manifestations[5].

The patients with traumatic injuries experience a sense of life threat and may be vulnerable to mental health problems because of underlying disease process and co morbid emotional problems. It has been found that regardless of the severity of injury, orthopaedic trauma is a major cause of personal suffering, ongoing pain, and disability, economic and social costs[6].

However there is paucity of work regarding psychopathology following bone trauma in India. The study endeavors to elicit various demographic factors and psychopathology following orthopaedic trauma.

2. Material and Methods

This study was undertaken at the Department of Orthopaedics and Psychiatry in Dr Vasantrao Pawar Medical College, Nashik-Maharashtra after approval from Institutional Ethics Committee. The sample was selected over a period of 18 months. Patients with age between

18 – 65 years and traumatic fracture of long bones of upper and lower limbs after 4 weeks of trauma and not beyond 6 weeks were selected. Unconscious patients, patients with traumatic brain injury, mental retardation, pre existing mental or psychological illness excluded by history were not included in the study.

The present study was conducted on 100 cases enlisting from the Department of Orthopaedics of a tertiary health care centre. The Department of Orthopaedics was requested to refer such cases who had sustained long bone fracture 4-6 weeks prior along with records of hospitalization and treatment to the Dept. of Psychiatry.

A special proforma was prepared to collect the following data -Demographical details, history of orthopaedic trauma, mental status examination. Cases were screened using MINI version 6.0 (Mini International Neuropsychiatric Interview)[7] to identify psychopathology.

The M.I.N.I. is designed as a brief structured interview for the major Axis I psychiatric disorders in DSM-IV and ICD-10. Validation and reliability studies have been done comparing the M.I.N.I. to the SCID-P for DSM-III-R and the CIDI (a structured interview developed by the World Health Organization for lay interviewers for ICD-10). The results of these studies show that the M.I.N.I. has acceptably high validation and reliability scores, but can be administered in a much shorter period of time (mean 18.7 ± 11.6 minutes, median 15 minutes). It can be used by clinicians, after a brief training session.

The clinical diagnosis was confirmed by two qualified Psychiatrists from the Dept of Psychiatry and necessary advice was given to the patient. Statistical Analysis was done using the EPI-INFO software.

3. Result

Axis I psychiatric disorders in the long bone fracture patients are shown in Table 1.

Table 1.   Axis I Diagnosis of Study Population

Axis I Psychiatric Diagnosis	No. of patients (N = 100)
Major depressive disorder	23
Major Depressive disorder + Co-morbidity	9
Post traumatic stress disorder	1
Total	33

Demographic characteristics of the long bone fracture patients and Axis I psychiatric diagnosis is given in (Table 2). Axis I psychiatric diagnosis shows significant association with age, marital status and education. ($p<0.05$)

The commonest cause of injury was road traffic accidents (n=58). The second commonest cause of injury was fall (n=40) and 02 had others cause of injury. Axis I psychiatric diagnosis was found more in road traffic

Table 2.   Socio Demographic Profile and Axis I Psychiatric Diagnosis

VARIABLES		N (%)	AXIS I PSYCHIATRIC DIAGNOSIS	STATISTICAL ANALYSIS
Gender	Male	71 (71%)	20 (60.6%)	$X^2 =2.58$ p= 0.10
	Female	29 (29%)	13 (39.4%)	
	TOTAL	100	33	
Age (years)	≤ 20	09 (09%)	0	
	21- 30	29 (29%)	5 (15.15%)	
	31-40	20 (20%)	10 (30.30%)	$X^2 =13.31$ p= 0.009
	41-50	15 (15%)	8 (24.24%)	
	>50	27 (27%)	10 (30.30%)	
	TOTAL	100	33	
Marital status	Married	76 (76%)	30 (91%)	$X^2 =8.16$ p= 0.01
	Unmarried	19 (19%)	1 (3%)	
	Widow/Divorced/Separated	05 (5%)	2 (6%)	
	TOTAL	100	33	

Education	Illiterate	26 (26%)	14 (42.42%)	X^2 =8.02
	Primary (0 -5)	10 (10%)	2 (6%)	p= 0.04
	Secondary (6- 12)	57 (57%)	14 (42.42%)	
	College	07 (7%)	3 (9%)	
	TOTAL	100	33	
Occupation	Skilled worker	16 (16%)	7 (21.21%)	X^2 =5.3
	Unskilled worker	64 (64%)	16 (48.48%)	p= 0.07
	Housewife	20 (20%)	10 (30.30%)	
	TOTAL	100	33	
Religion	Hindu	95 (95%)	32 (96.9%)	X^2 =0.02
	Muslim	05 (5%)	1(3%)	p= 0.8
	TOTAL	100	33	
Place of Residence	Rural	95 (95%)	32 (96.9%)	X^2 =0.02
	Urban	05 (5%)	1 (3%)	p= 0.5
	TOTAL	100	33	
Type of family	Nuclear	46 (46%)	15 (45.45%)	X^2 =0.02
	Joint	54 (54%)	18 (54.54%)	p= 0.9
	TOTAL	100	33	

Table 3. Association between Orthopaedic Trauma and Axis I Psychiatric Disorder

VARIABLES		N (%)	AXIS I PSYCHIATRIC DIAGNOSIS	STATISTICAL ANALYSIS
CAUSE OF INJURY	ROAD TRAFFIC ACCIDENTS	58 (58%)	18 (54.54%)	
	FALL	40 (40%)	15 (45.45%)	X^2 =1.45
	OTHERS	2 (2)%	0	p=0.48
	TOTAL	100	33	
TYPE OF FRACTURE	CLOSED FRACTURE	86 (86%)	26 (78.78%)	X^2 =2.13
	OPEN FRACTURE	14 (14%)	7 (21.2%)	p= 0.14
	TOTAL	100	33	
FRACTURE INVOLVING LIMB	UPPER LIMB	16 (16%)	4 (12.12%)	X^2 =2.11
	LOWER LIMB	79 (79%)	26 (78.78%)	p= 0.348
	BOTH UPPER AND LOWER LIMB	5 (5%)	3 (9%)	
	TOTAL	100	33	

Others: Assault, Heavy object

accidents 18 (54.5%), in closed fracture 26 (78.78%) and in lower limb fracture 26 (78.78%). (Table 3)

4. Discussion

Prevalence of axis I psychiatric diagnosis in the present study was found to be 33 %. Similar findings were noted by Chaudhary et al.[8] 35%. Majority patients of axis I psychiatric diagnosis belongs to major depressive disorder (23%).

The prevalence rate of depression was reported as 45% by Crichlow et al.[9] and 33% by Mores et al[10].

Second most common axis I psychiatric diagnosis was major depressive disorder comorbid with anxiety disorders (9%). There are no studies on orthopaedic trauma which have previously described about the major depressive disorder comorbidity with other psychiatric disorder. However this was in accordance with other studies on physical trauma which described the onset of various comorbid psychiatric disorders[11,12].

In the present study only one patient (1%) had PTSD; this finding was not in accordance with various western studies which reported prevalence of PTSD 8.3%-51%[13–18].

In the present study, axis I psychiatric diagnosis was found more in males 60.6%. Similar finding reported by Matsuoka et al.[11] in which onset of new psychiatric diagnosis at 4-6weeks in males was 58.06% and females was 41.93%. Axis I psychiatric diagnosis was found more in the age group 31-40 yrs and > 50 yrs i.e. 30.30%. In a study by Bryant et al.[12] who describe the onset of new psychiatric diagnosis in age group of 35-44 yrs i.e. 30.9%. Axis I psychiatric diagnosis was present significantly high in married individuals 96%. The finding was in accordance with study by Bryant et al.[12] in which onset of new psychiatric diagnosis was found in married individuals 50.5%. Axis I psychiatric diagnosis was found more in illiterate and secondary school individuals (i.e. 42.42 %). Similar finding reported by Bryant et al.[12] in which psychiatric diagnosis was found more in high school individuals 41.9%. Axis I psychiatric diagnosis was found more in unskilled individuals 48.48%. No reference stating relationship between occupation and axis 1 psychiatric diagnosis is currently available. Axis I psychiatric diagnosis was found more in Hindu individuals residing in rural area i.e. 96.6% However there are no previous studies which assess the role of religion, place of residence in development of psychiatric morbidity in traumatic bone injury. Axis I psychiatric diagnosis was found more in Joint family 18 (54.54%). Thus social support was not found to have any significant

influence amongst patients with limb fracture as far as development of subsequent psychopathology is concerned. The finding was in accordance with study by Maselesele et al.[19] who reported that social support does not play any role in development of axis I psychiatric disorder in patients with orthopaedic trauma.

In the present study, axis I psychiatric diagnosis was found more in road traffic accidents 54.54% as compared to falls 45.45%. This was in accordance with study by shalev. et al.[20], O'donnell et al.[21], holbrok et al.[22] Mellman et al.[23], which described onset of various psychiatric disorders following road traffic accidents. Experiencing a sense of life threat during a road traffic accident was an independent predictor for the development of psychiatric morbidity at 4- 6 weeks after the road traffic accident[11].

In the present study, axis I psychiatric diagnosis was found more in closed fracture 78.78% as compared to open fracture 21.21%. Bhandari et al.[24] found that there was no association between open or closed fracture and psychological symptoms. However, it was not in agreement with study by Crichlow et al.[9] who found that the presence of an open fracture may also increase the risk of depression.

Axis I psychiatric diagnosis was found more in persons with lower limb fracture. However the association between fracture involving limb and psychopathology was statistically not significant.

Crichlow et al.[9] also noted similar findings that there was no relationship between fracture involving limb and axis I psychiatric diagnosis. However, a study by Chaudhary et al.[8] found that there was significant association between fracture involving limb and axis I psychiatric diagnosis.

5. Conclusion and Summary

Study revealed that major depressive disorder was most common axis I psychiatric diagnosis among males. Road traffic accident was significantly the most common cause of injury. Axis I psychiatric diagnosis shows significant association with age, marital status and education. Psychopathology was found more in the road traffic accidents and individuals with closed and lower limb fracture.

Mental illness is an independent predictor of poor outcome following orthopaedic trauma, and future studies should explore whether management of psychological symptoms and psychopathology

independently predicts recovery from orthopaedic trauma. Hence good mental health care will have beneficial impact on the traumatic long bone injury patients.

6. Limitations

1. The study was conducted in a tertiary hospital and is representative of the flow of patients at this hospital. So the results cannot be generalized as the patients flow may differ from other hospitals.
2. The findings found in the study need to be further carefully evaluated in patients with larger sample size.

7. Recommendation

In view of occurrence of psychopathology following long bone trauma. Orthopaedic surgeons need to be aware of these conditions so that they should refer patients for psychiatric evaluation and receive appropriate treatment.

8. References

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