PSYCHIATRIC EVALUATION OF LIMB FRACTURE PATIENTS

Lt Col S CHAUDHURY*, Maj TR JOHN⁺,
Brig A KUMAR[#], Lt Gen HARCHARAN SINGH, PVSM, PHS (Retd) **

ABSTRACT

The study included 70 consecutive patients with fracture of the lower and upper limbs each and an equal number of age and sex matched normal control subjects. All the subjects were screened using the General Health Questionnaire (GHQ), the Michigan Alcoholism Screening Test (MAST), Carroll Rating Scale for Depression (CRSD), State-Trait Anxiety Inventory (STAI), Impact of Events Scale (IES), Fatigue Scale (FS) and the Perceived Stress Questionnaire (PSQ). Probable "Psychiatric cases" identified by the questionnaires underwent diagnostic psychiatric evaluation. As compared to normal controls, the limb fracture patients obtained significantly higher scores on the GHQ, MAST, CRSD, IES & FS but not on the STAI & PSQ. Psychiatric evaluation revealed significantly higher prevalence of psychiatric disorders in lower limb fracture patients (n=31) as compared to upper limb fracture patients (n=18) and control subjects (n=6). Limb fracture patients had a high prevalence of alcohol dependence/abuse (24.3%) and depressive disorders (6.4%). The results indicate that psychological intervention would greatly facilitate the management of these patients.

MJAFI 2002; 58 : 107-110

KEY WORDS:Alcohol dependence; Depression; Limb fracture patients; Psychological morbidity.

Introduction

The Armed Forces personnel are engaged in low intensity operations in the northern sector, in addition to their deployment along the borders. They frequently operate in extremely inhospitable terrain and are often required to move fast in adverse conditions. Therefore, fractures of the limbs are not an uncommon occurrence in them. Limb fractures which cause pain, prolonged discomfort, loss of function and/or immobility, are expected to produce adverse psychological effects, but have not been systematically studied. However, behavioural disturbances and psychiatric disorders are reported to be three to five times more frequent among people with injuries severe enough to require a stay in hospital [1]. Undetected psychiatric morbidity in medical and surgical wards have been estimated to vary from 20% to 80%, but only a small fraction of these are correctly identified and treated [2-4]. Undiagnosed psychological morbidity leads to much unalleviated and avoidable suffering to the patient. In addition, maladaptive behaviour due to anxiety, depression, acute and chronic brain syndromes, psychoses and substance abuse may modify the clinical presentation and complicate the management of the underlying medical or surgical condition [3-5]. It is obvious that identification and treatment of psychological disorders in these

patients may not only improve the ease of treatment but also the speed and completeness of the patient's recovery. The paucity of Indian work in this field prompted us to undertake the present study.

Material and Methods

The study was conducted at the orthopaedic centre of a large, referral hospital during the period Oct 97 to Feb 99 on two groups of consecutively admitted male patients with fractures of upper limbs and lower limbs respectively. Equal number of age and sex matched normal subjects without any known medical or psychiatric disorders formed the control group, and underwent all the evaluations along with patients. Socio-demographic data along with details of injury were recorded on a specially designed proforma. During the third week of hospitalization, after the initial orthopaedic treatment had been completed, the patients underwent the following psychological evaluations :

1. The General Health Questionnaire : This is a self-rated questionnaire. Each question has four possible responses: less than usual, no more than usual, rather more than usual, or much more than usual. The respondent is requested to underline the response which best fits how they have felt recently. The 30-item version was used on which a score of five discriminates most accurately between "cases" and "non cases". The questionnaire was designed for use in community settings and primary care [6].

2. The Michigan Alcoholism Screening Test : This 25 item interview comprises questions relating to personal opinions on drinking, opinions of family and friends, problems arising from drinking and symptoms of alcohol dependence. It has a high sensitivity in detecting alcoholism. The questions are scored from 1 to 5. In general, 5 points or more places the subject in an alcoholic category; 4 points is suggestive of alcoholism. Programs using this

*Reader, Department of Psychiatry, Armed Forces Medical College, Pune - 411 040, ⁺Classified Specialist (Psychiatry), Command Hospital, (Southern Command), Pune 411 040, [#]Commandant, Artificial Limb Centre, Pune - 411 040, **Ex-Director General of Medical Services (Army).

scoring system find it very sensitive at the five-point level, and it tends to find more people alcoholic than anticipated. However, it is a screening test and should be sensitive at its lower level [7].

3. Carroll Rating Scale for Depression : The CRSD is a 52 item self-rating version of the Hamilton Depression Rating Scale for the measurement of depression. Each item has a forced choice response alternative of yes or no. The scores are summed up to give a total score. The possible range of scores varies from 0-52. The CRSD has acceptable face validity and reliability. The concurrent validity of CRSD is also acceptable based on comparisons with the Hamilton Depression Rating Scale and Beck Depression Inventory [8].

4. The State - Trait Anxiety Inventory : It has been extensively used in research and clinical practice. It comprises separate self-report scales for measuring state and trait anxiety. The S Anxiety scale (STAI form Y-1) consists of twenty statements that evaluate how respondents feel "right now, at this moment". The T-Anxiety scale (STAI form Y-2) consists of twenty statements that assess how people generally feel. Each STAI item is given a weighted score of 1 to 4. Scores on both the scales can vary from a minimum of 20 to a maximum of 80 [9].

5. Impact of Events Scale : The IES measures the current degree of subjective impact experienced as a result of a specific event. It is a self-administered screening test designed to detect two response sets following potentially traumatic events common to PTSD. The IES yields two subscale scores : (i) Intrusive subscale comprising intrusive feelings and ideas associated with an event, and (ii) Avoidance subscale comprising avoidance of thoughts, situations and feelings associated with the event. The reliability and validity of the IES total and subscale scores has been confirmed [10].

6. Fatigue scale : This 11 item of self-rating scale was developed to measure the severity of fatigue. It gives two scores, one for physical fatigue and one for mental fatigue. It is easy to administer, reliable and valid, despite its brevity [11].

7. Perceived Stress Questionnaire : The 30 question self-administered PSQ emphasizes cognitive perception more than emotional state or specific life events. It has high internal consistency, high reliability and demonstrated construct validity. It is in two forms : the general (past year or two) PSQ and the recent (past month) PSQ. In the present study the recent PSQ was used [12].

After scoring of the questionnaires, subjects identified as probable "cases", underwent diagnostic psychiatric evaluation. The psychiatric diagnoses were made as per ICD 10 DCR criteria [13]. Statistical comparisons were performed using the Chi square test (with Yates correction) and Kruskal-Wallis one way analysis of variance by ranks.

Results

Demographic characteristics of the upper and lower limb fracture patients and control subjects is given in Table 1. There were no statistically significant differences between the groups on any of the demographic characteristics. Analysis of the time of the accidents showed that the majority of injuries, upper limb 51 (72.86%), lower limb 48 (68.57%), occurred during the daytime hours. The mean duration of time between accident and initial hospitalization was only 5.3 hours (range of time was 15 min to 21 hours), which is reasonably satisfactory considering the fact that many of the injuries occurred in remote and inaccessible locations and some in counter-insurgency operations. The commonest cause of injury was road traffic accidents (n=61). The second commonest cause of injury was related to duty (n=57) and included : injury on duty (n=25), accidents on duty (n=21), and accidents in training

and recreational activities (n=11). Accidents off duty hours (n=22) accounted for the rest.

TABLE 1

Characteristics of lower limb fracture (LLF) patients (n= 70), upper limb fracture (ULF) patients (n= 70) and normal controls (n=70)

Characteristics	LLF patients	ULF patients	Normal controls	Significance
Age (in years)				
Mean	31.67	30.39	30.46	—
Range	21-56	19-48	19-49	—
Distribution				
< 30	33	38	36	$\chi^2 = 1.28$
31-40	30	28	28	df = 4
> 40	7	4	6	p > 0.70
Rank				
JCO	6	5	4	$\chi^2 = 1.71$
Hav	11	14	16	df = 6
Nk	13	10	10	p > 0.90
Sep	40	41	40	
Education				
0 - 5	4	2	2	$\chi^2 = 2.44$
6 - 10	47	52	48	df = 4
> 10 class	19	16	20	p > 0.50
Marital status				
Married	58	53	49	$\chi^2 = 3.20$
Unmarried	12	17	13	df = 2; p > 0.20
Domicile				
Rural	59	58	57	$\chi^2 = 0.20$
Urban	11	12	13	df = 2; p > 0.90
Religion				
Hindu	64	61	62	$\chi^2 = 0.68$
Sikh	4	9	7	df = 2
Muslim	2	—	1	p > 0.20

Analysis of the scores on the psychological tests (Table-2) revealed that on GHQ, MAST and CRSD, significantly higher number of fracture patients were identified as cases, as compared to controls. In addition, on the GHQ, significantly more upper limb fracture patients compared to lower limb fracture patients were identified as "cases". However, on the IES only the lower limb fracture patients obtained significantly higher total and intrusive subscale scores as compared to upper limb fracture patients and control subjects. On the FS (Physical), the fracture patients obtained significantly higher scores as compared to the normal controls. Psychiatric disorders in the limb fracture patients and normal controls are shown in Table-3.

Discussion

The present study was conducted on a special group of subjects viz. the security force personnel in counter-insurgency area. Hence the results should be interpreted with caution. However, as seen below, some of the results are in agreement with studies conducted in civil hospitals and therefore the results of the present study can be generalized to the army population. Though injuries related to security force duty (n=57) in areas where they are engaged in low-intensity con-

TABLE 2

Results of psychological tests of lower limb fracture (LLF) patients (n=70), upper limb fracture (ULF) patients (n=70) and normal controls (n=70)

Tests	I. LLF patients	II. ULF patients	III. Normal controls	Significance		
				I vs II	I vs III	II vs III
General health questionnaire > 5	33	21	9	< 0.05	< 0.01	< 0.05
Michigan Alcoholism screening test > 5	17	16	7	NS	< 0.05	< 0.05
Carroll rating scale for depression > 10	29	19	5	NS	< 0.01	< 0.01
State anxiety	36.09	34.61	34.43	NS	NS	NS
Trait anxiety	35.33	32.94	32.01	NS	NS	NS
Impact of events Scale :Intrusive	11.87	3.89	2.79	< 0.05	< 0.05	NS
Avoidance	16.57	13.11	12.21	NS	NS	NS
Total	28.4	17.0	15.0	< 0.05	< 0.05	NS
Fatigue scale						
Physical	2.37	2.41	0.73	NS	< 0.05	< 0.05
Mental	0.94	0.83	0.71	NS	NS	NS
Perceived stress questionnaire	0.49	0.48	0.48	NS	NS	NS

NS - not significant

TABLE 3

Psychiatric disorders in lower limb fracture (LLF) patients (n=70), upper limb fracture (ULF) patients (n=70) and normal controls (n=70)

Psychiatric disorders	LLF patients	ULF patients	Normal controls
Organic mental disorder	2	1	—
Harmful use of alcohol	11	9	4
Alcohol dependence syndrome	6	5	1
Alcohol withdrawal state with delirium	1	—	—
Drugdependence (opioids)	2	—	—
Schizophrenia	1	—	—
Acute stress disorder	2	—	—
Adjustment disorder	6	3	1
Total	31	18	6

Chi square test :

LLF patients vs ULF patients : $\chi^2 = 5.31$; df = 1; $p < 0.05$

LLF patients vs normal controls : $\chi^2 = 22.95$; df = 1; $p < 0.01$

ULF patients vs normal controls : $\chi^2 = 7.24$; df = 1; $p < 0.05$

flicts are expected, the high number due to road traffic accidents (n=61) was unexpected but in agreement with earlier studies on civilian population [3,14]. This indicates the urgent need for instituting preventive measures aimed at improving army mechanical transport discipline, which could certainly bring down morbidity and mortality from this cause.

The significantly higher scores on CRSD obtained

by limb fracture patients indicating significantly higher levels of depression in them, was on expected lines and is in agreement with earlier studies [14]. However, in contrast to an earlier Indian study [15] anxiety levels in limb fracture patients was not significantly lower than the normal controls. A probable explanation for this could be that in the earlier study patients were evaluated after evacuation from the battle zone, while in the present study they were evaluated in the same area.

The major finding of our study was high incidence of (35%) psychiatric disorders in limb fracture patients, of whom only 5 (4.3%) had been referred for psychiatric management by the treating surgeon. Substance abuse/dependence was the commonest diagnosis seen in 24.3% patients while depressive syndromes were second in frequency occurring in 6.4 patients. It is pertinent to note here that we must differentiate between alcohol use, alcohol abuse and alcohol dependence, with alcoholism being more related to how a person drinks than how much. While the occasional drinker may actually be more careful after ingestion, the accident mortality rate for problem drinkers is elevated when they are not drunk, with the possibility of even greater expression of their psychopathology under the disinhibiting influence of alcohol [2]. It has been observed that more patients with alcohol related problems are found in orthopaedic units than anywhere else in the hospital [5,16] and our findings are certainly consistent with this. It has also been reported that alcohol habit may contribute to the accidents, which result in fractures. However, in the present study this was found only in 3 patients. In addition, alcohol abuse and dependence can significantly contribute to serious psychopathology and while some patients may "medicate" their depression with alcohol, it is also well known that alcohol can cause or aggravate depression.

In the present study, out of the 49 patients identified to have psychiatric disorders, only 6 (4.3%) were referred for psychiatric management. This finding highlights the problem of underrecognition and under treatment of psychiatric disorders, especially substance abuse disorders, which is well known in all areas of medicine [2-4,17,18]. This is regrettable since the general hospital affords one of the best opportunities for identification and treatment of these conditions. Obviously surgeons and physicians need to be sensitized to the common occurrence of comorbid psychiatric disorders in their patients.

The psychopathology found in the limb fracture patients in the present study is serious and apart from

causing suffering to the patient may also adversely affect his treatment. Alcohol withdrawal problems with resulting uncooperativeness is likely to lead to increased rate of complications. Alcohol induced organic mental disorders may cause confusion and even delirium. Depressive states not only cause emotional suffering, but also lead to pessimism, negativism or even self-punishing behaviour, which could jeopardize treatment. The maladaptive behaviour may alienate the patient from the care givers leading to serious management problems and complicating recovery. The inescapable conclusion is that psychiatric assistance will definitely facilitate in-hospital management and increase the chances of uncomplicated recovery of limb fracture patients.

References

1. Malt UF. Psychiatric aspects of accidents, burns and other trauma. In : Gelder MG, Lopez-Ibor JJ, Andreasen N. Editors. New Oxford Textbook of Psychiatry. Oxford. Oxford University Press 2000;1185-93.
2. Gobar AH, Collins JL, Mathura CB. Utilisation of a consultation-liaison psychiatry service in a general hospital. Journal of the National Medical Association 1987;79:505-8.
3. Kuhn WF, Bell RA, Netscher RE, Seligman D, Kuki SO. Psychiatric assessment of leg fracture patients : A pilot study. International Journal of Psychiatry in Medicine 1989;19:145-54.
4. Clark DA, Cook A, Snow D. Depressive symptom differences in hospitalised medically ill, depressed psychiatric inpatients and nonmedical controls. J Abnormal Psychol 1998;107:38-48.
5. Elvy GA, Gillespie WJ. Problem drinking in orthopaedic patients. J Bone Joint Surg 1985;67B:478-81.
6. Goldberg DP. The detection of psychiatric illness by questionnaire. London:Oxford University Press, 1972.
7. Gribbs LE. Validity and reliability of the Michigan Alcoholism Screening Test : A review. Drug and Alcohol Dependence 1983;12:279-85.
8. Carroll BJ, Feinberg M, Simouse PE, Rawson SG, Greden JL. The Carroll rating scale for depression. Br J Psychiatry 1981;138:194-200.
9. Spielberger CD, Gorsuch RL, Lushene R, Vagg PR, Jacobs GA. State Trait Anxiety Inventory. California : Consulting Psychological Press 1983:1-12.
10. Horowitz M, Wilner N, Alvarez W. Impact of event scale : A measure of subjective stress. Psychosomatic Medicine 1979;41:209-18.
11. Chadler T, Berelowitz G, Pawlikowska T, Watta L, Wessely S, Wright D. et al. Development of a fatigue scale. J Psychosom Res 1993;37:147-53.
12. Levenstein S, Prantera C, Varvo V, Scribano ML, Berto E, Luzzi C, et al. Development of the Perceived Stress questionnaire : A new tool for psychosomatic research. J Psychosom Res 1993;37:19-32.
13. WHO. The ICD-10 Classification of Mental and Behavioural Disorders. Diagnostic Criteria for Research. Geneva : World Health Organization 1993;1-248.
14. McKegney FF, Beckhardt RM. Evaluative research in consultation-liaison psychiatry. Gen Hosp Psychiatry 1982;4:197-218.
15. Dubey BL, Singh R, Budhiraj SK. Anxiety in limb injury cases during Indo-Pak conflict - 1971. MJAFI 1977;33:454-8.
16. Beresford D, Low R, Adducis R. Alcoholism assessment on an orthopaedic service. J Bone Joint Surg 1982;64A:730-3.
17. Carson RC, Butcher JN, Mineha S. Abnormal Psychology and Modern Life 8th ed. New York : Harper Collins College Publishers 1998;119-55.
18. Mayou R, Hawton K. Psychiatric disorder in the general hospital. Br J Psychiatry 1986;149:172-90.