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Depression Following Spinal Cord Injury
A Prospective In-patient Study

FIONA K. JUDD, JILLIAN STONE,
JOHN E. WEBBER, DOUGLAS J. BROWN and GRAHAM D. BURROWS

In a systematic prospective study of 71 patients with acute spinal cord injury carried out in the acute and rehabilitation phases of treatment, 14 patients meeting the DSM-III criteria for major depressive disorder were identified. A further 13 patients had transient periods of depressed mood, while the majority of patients showed no clear evidence of depression. The BDI was found to be valid in this group of patients.

Depressed mood is thought to be common after spinal cord injury (SCI), but the nature of this mood disturbance is debated. Many consider that it is only to be expected that those with SCI will be depressed, and that lowered mood is a normal response to the injury (Witthower *et al*, 1954; Stewart, 1977*a*; Bracken & Shepard, 1980). Some consider it to be inevitable (Hohmann, 1975; Stewart, 1977*b*). Studies suggesting that depressed mood is common have been largely based on anecdotal descriptions of patients, not empirical evidence. Lowered mood may be a normal or understandable response to SCI, may be part of 'normal' grief, or may be indicative of a depressive illness. Recent clinical studies have suggested that depression may be less common than previously thought (Lawson, 1978; Fullerton *et al*, 1981). Our own experience suggests a significant number of patients suffer from depressive illness following SCI, and that this can be differentiated from other forms of lowered mood (Judd *et al*, 1986). The following pilot study prospectively examined the prevalence of depressive illness in patients following acute SCI, and assessed the utility of a standard depression rating scale in their assessment.

Method

The Austin Hospital Spinal Injuries Unit admits all patients from Victoria, Tasmania, and the southern Riverina area of New South Wales who sustain a traumatic SCI. All English-speaking patients older than 18 years, who sustained a traumatic SCI, and who did not have a significant head injury or pre-existing psychiatric or organic mental disorder, were asked to participate in the study.

All patients were admitted to the Spinal Injuries Unit within 24 hours of their accident. Each patient was interviewed within two weeks of admission by the liaison psychiatrist attached to the unit. Sociodemographic information, current psychiatric symptomatology, previous psychiatric, social and medical history, and general medical status were covered using the Structured Clinical Interview for DSM-III (SCID; Spitzer & Williams, 1983). Diagnoses were made according to DSM-III criteria (American Psychiatric Association, 1980), and were categorised as predating or occurring for the first time after the injury. Patients completed the Beck Depression Inventory (BDI; Beck *et al*, 1961) and the clinician completed the Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960). Patients were then seen weekly throughout their in-patient stay in the acute medical and rehabilitation wards of the Spinal Injuries Unit by the liaison psychiatrist or psychologist and, as a screening instrument to monitor depression, completed the BDI weekly.

The BDI consists of a list of descriptive statements addressing 21 aspects of depression. Each category contains four to five statements of increasing severity. The score for each item ranges from 0 to 3, and the total score ranges from 0 to 62. Beck (1961) has reported that a cut-off point of 14 differentiates effectively between depressives and non-depressives. Any patient who scored 14 or more was reinterviewed by the liaison psychiatrist, to confirm or refute the diagnosis of a major depressive disorder (MDD), and the HRSD was repeated.

Results

Of 102 consecutive admissions to the unit, 71 patients were assessed from time of admission, through the acute and rehabilitation phases of treatment, to discharge into the community. Patients not included in the study were those: aged less than 18 years ($n=6$), with conversion disorder ($n=4$), with severe head injury or prolonged organic brain syndrome ($n=4$), with schizophrenia ($n=3$), with early (less than one month) neurological recovery ($n=4$), with poor English ($n=1$), deceased soon after admission ($n=3$). One patient had a MDD (DSM-III) predating the injury, and sustained his injury when attempting suicide. In addition, five patients refused to participate in the study.

The 71 patients (52 men) participating in the study ranged in age from 18 to 69 (mean 31.4) years; 41 were paraplegic and 30 were quadriplegic, and all had sustained their injury as the result of trauma.

TABLE I
Distribution of BDI scores

BDI	*Paraplegic (n = 41)*		*Quadriplegic (n = 30)*		*Total*
	Male	*Female*	*Male*	*Female*	
Consistently < 14 (not depressed)	18	7	14	5	44 (62%)
Isolated > 14 (understandable dysphoria)	7	2	3	1	13 (18%)
Persistently > 14 (depressive illness)	5	2	5	2	14 (20%)

Weekly evaluation throughout the acute treatment and rehabilitation phase showed three clear patterns. Forty-four patients consistently scored less than 14 on the BDI, and showed no evidence at clinical interview of depressive illness, although transient periods of dysphoric mood were noted. A second group (13 patients) had isolated scores of more than 14 on the BDI, and detailed psychiatric reassessment at this time confirmed lowered mood. Rather than being indicative of a depressive illness, their increased dysphoria appeared to be the result of social factors (e.g. separation from family) and complications of the injury (e.g. poorly controlled pain). In this group the dysphoria was transient, and resolved following psychotherapeutic intervention and correction of the identified causative factors. In a third group (14 patients) the BDI was persistently elevated (> 3 weeks, BDI > 14), and MDD was confirmed at reassessment (Table I).

Details regarding the patients who developed MDD are shown in Table II. The 14 patients (ten men) ranged in age from 18–51 (mean 31.6) years. Seven were paraplegic and seven were quadriplegic. One patient had a past history of MDD and two of dysthymic disorder. Vulnerability factors identified in six other patients are listed in Table II. Similar factors were observed less frequently in the other two patient groups (3 of 13 and 11 of 44 patients). Onset of depressive illness was 3–40 weeks after injury. Scores on the HRSD (17 items) at the time of diagnosis ranged from 18 to 30 (mean 24.4). All patients identified as having MDD were treated with supportive psychotherapy, and prescribed antidepressant (tetracyclic and tricyclic) medication, initiated when clinical reassessment confirmed the diagnosis of MDD, following persistently elevated BDI scores. Thirteen of the patients improved with treatment (mean BDI at discharge = 8), and for eight this improvement was evident within four weeks of prescription of medication, and appeared to be directly attributable to the medication. One patient with persistent symptoms required in-patient care in the psychiatric unit. Four patients, although markedly improved with treatment, continued to experience episodic mild exacerbations of their mood disturbance. One patient refused antidepressant medication and remained significantly depressed (BDI score of 20) when discharged to out-patient follow-up.

TABLE II
Patients with major depressive disorder

Age	*Sex*	*SCI*	*Vulnerability factor*	*Diagnosis of major depressive disorder*			
				No. of weeks admission	*Ward*	*BDI score*	*HRSD score*
47	F	L1	Past history of anxiety	3	AT[1]	16	24
49	F	T4	Schizoid personality traits	4	AT	15	18
51	F	C5	Past history of MDD	4	AT	18	26
41	M	T6	None detected	5	AT	18	25
19	M	T11	None detected	6	AT	43	30
28	M	C6	Past history of dysthymic disorder	8	AR[2]	24	26
22	M	C5	Past history of polydrug abuse	10	AR	22	24
51	M	C7	None detected	10	AT	18	22
34	M	C6	Past history of dysthymic disorder	12	AR	20	24
21	M	T8	Past history of alcohol abuse	14	AT	19	24
19	M	T11	Family conflict	16	AR	33	28
24	M	L3	Wife killed in accident	22	AR	17	23
19	F	C5	None detected	24	AR	14	18
18	M	C4	None detected	40	AR	14	24

1. Acute medical treatment.
2. Active in-patient rehabilitation.

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Discussion

Two main issues were examined in this study, the first concerning the prevalence of depressive illness following SCI. Methodological problems have made studies of the nature and prevalence of depression in the physically ill difficult to interpret. Particular difficulties are that heterogeneous subject populations have been studied, there has been a lack of clarity regarding the definition of cases, and an absence of assessment measures that have been standardised in medically ill patients. Available studies suggest that the prevalence of depressive illness in patients with medical illness varies from 5% to 30% (Schwab *et al*, 1967*a*,*b*; Stewart *et al*, 1965; Porter, 1970; Glass *et al*, 1978; Neilsen & Williams, 1980). Five per cent is no different from the general population, while 30% is five to six times the expected rate.

In the present prospective study of a population homogeneous with respect to physical illness, using a two-stage process for assessment of depression and DSM–III diagnostic criteria, we found that the majority of patients experienced mild and transient periods of low mood, which could be considered a 'normal' response to the losses due to SCI. Some patients experienced transient, more severe mood disturbance in the context of medical or interpersonal and social problems, but these could also be regarded as normal and understandable. A second discrete group, comprising 20% of patients, developed MDD, and were readily distinguished from those with 'normal' or 'understandable' responses. This finding is similar to that for other groups of medically ill patients, and while some studies suggest a higher prevalence of depressive disorders in SCI, it is consistent with the findings of Fullerton *et al* (1981), who found 30% of patients developed major or minor depression (according to Research Diagnostic Criteria) after injury.

Depressive disorders occurred with similar frequency in paraplegics and quadriplegics (17% v. 23%). This pattern does not fit well with the common view that as severity of injury increases, so does the risk of depression. The sex ratio for those with depressive disorders was equal to the overall ratio of male : female patients (5:2). Personality, interpersonal, and illness variables suggesting vulnerability to depression were significantly more frequently identified in those developing a depressive illness, as revealed by χ^2 analysis ($\chi^2 = 8.27$, $P < 0.05$). The time of onset of depressive illness varied widely, perhaps suggesting the involvement of diffuse aetiological factors, including not only the injury and the individual's response to it, but also interpersonal and social consequences of the injury, as well as possible neurophysiological and neuroendocrine changes. It should be noted, however, that our study assessed patients only during the acute treatment and active rehabilitation stages. More patients may develop a depressive illness during rehabilitation into the community, consequent upon the stress of re-establishing family, social, and vocational roles.

Although all patients were treated by supportive psychotherapy, antidepressants, and the medical and rehabilitation therapies, recovery from depression appeared to be clearly related to the antidepressant medication. Seven patients developed a MDD during the acute treatment phase and of these, five showed a marked response to antidepressant treatment before transfer to the active rehabilitation phase. Seven patients developed a MDD during their rehabilitation, and improvement did not appear to be linked to particular events in their rehabilitation course. This is in contrast to the 13 patients with isolated BDI scores greater than 14, where the development and resolution of dysphoria often did appear to be related to particular medical treatment events.

The second issue examined concerned the utility of a standard depression rating scale in the assessment of patients following SCI. The BDI appeared to be a valid measure of depressive illness in this group of patients. A cut-off point of 14, as previously used by Moffic & Paykel (1975) in medical in-patients, was used in this study. We found both the degree and persistence of BDI score to be of diagnostic use. Patients consistently scoring greater than 14 were diagnosed as suffering from a MDD, while those with isolated elevated scores did not receive this diagnosis. It has previously been suggested that the heavy weighting of the BDI with items such as pessimism, sense of failure, and sense of punishment makes it particularly suitable for use in the medically ill. We found that items most likely to distinguish between depressed and non-depressed patients were sadness, somatic preoccupation, anorexia, pessimism, guilt, irritability, and suicidal ideas. Although somatic preoccupation, anorexia, and insomnia were common in both depressed and non-depressed patients, they were qualitatively different and more severe in those with a depressive illness. Certain items, for example weight loss, occurred in all SCI patients, and thus were not of discriminative value.

In conclusion, the results of this study do not substantiate earlier observations that all patients with SCI experience depression, but they do suggest that a substantial proportion of patients suffer from a

depressive illness distinct from the normal response to SCI. Furthermore, we have indicated that this group can be readily identified by systematic evaluation of patients using conventional interview techniques and rating scales, and that such patients do respond to treatment with antidepressant medication. Further studies to confirm and extend these findings are indicated.

References

AMERICAN PSYCHIATRIC ASSOCIATION (1980) *Diagnostic and Statistical Manual of Mental Disorders* (3rd edn) (DSM-III). Washington, DC: APA.

BECK, A. T., WARD, C. H., MENDELSON, M., *et al* (1961) An inventory for measuring depression. *Archives of General Psychiatry*, **4**, 561–571.

BRACKEN, M. B. & SHEPARD, M. J. (1980) Coping and adaptation following acute spinal injury. A theoretical analysis. *Paraplegia*, **18**, 74–85.

FULLERTON, D. T., HARVEY, R. F., KLEIN, M. H., *et al* (1981) Psychiatric disorders in patients with spinal cord injuries. *Archives of General Psychiatry*, **38**, 1369–1371.

GLASS, R. M., ALLAN, A. T., UHLENHUTH, E. H., *et al* (1978) Psychiatric screening in a medical clinic – an evaluation of a self-report inventory. *Archives of General Psychiatry*, **35**, 1189–1195.

HAMILTON, M. (1960) A rating scale for depression. *Journal of Neurology, Neurosurgery and Psychiatry*, **23**, 56–62.

HOHMANN, G. (1975) Psychological aspects of treatment and rehabilitation of the spinal injured person. *Clinical Orthopaedics*, **112**, 81–88.

JUDD, F. K., BURROWS, G. D. & BROWN, D. J. (1986) Depression following acute spinal cord injury. *Paraplegia*, **24**, 358–364.

LAWSON, N. (1978) Significant events in the rehabilitation process: the spinal cord patient's point of view. *Archives of Physical Medicine and Rehabilitation*, **59**, 573–579.

MOFFIC, H. S. & PAYKEL, E. S. (1975) Depression in medical inpatients. *British Journal of Psychiatry*, **126**, 346–353.

NEILSEN, A. C. & WILLIAMS, T. A. (1980) Depression in ambulatory medical patients – prevalence by self-report, questionnaire and recognition by non-psychiatric physicians. *Archives of General Psychiatry*, **37**, 999–1004.

PORTER, A. M. W. (1970) Depressive illness in a general practice – a demographic study and a controlled trial of imipramine. *British Medical Journal*, *i*, 773–778.

SCHWAB, J. J., BIALOW, M., BROWN, M. M., *et al* (1967*a*) Diagnosing depression in medical inpatients. *Annals of Internal Medicine*, **67**, 695–707.

——, ——, CLEMMONS, R., *et al* (1967*b*) The Beck Depression Inventory in medical inpatients. *Acta Psychiatrica Scandinavica*, **43**, 255–266.

SPITZER, R. L. & WILLIAMS, J. B. W. (1983) *Structured Clinical Interview for DSM III (SCID)*. New York: Biometrics Research, New York State Psychiatric Institute.

STEWART, M. A., DRAKE, F. & WINOKUR, G. (1965) Depression among medically ill patients. *Diseases of the Nervous System*, **26**, 479–485.

STEWART, T. D. (1977*a*) Spinal cord injury: a role for the psychiatrist. *American Journal of Psychiatry*, **134**, 538–541.

—— (1977*b*) Coping behaviour and the moratorium following spinal cord injury. *Paraplegia*, **15**, 338–342.

WITTHOWER, E., GINGRAS, G., MEGLER, L., *et al* (1954) A combined psychosocial study of spinal cord lesions. *Journal of the Canadian Medical Association*, **71**, 109–115.

*Fiona K. Judd, MD, DPM, FRANZCP, *First Assistant, University of Melbourne, Department of Psychiatry, Austin Hospital, Heidelberg*; Jillian Stone, BA, DipEdPsych, *Research Assistant*; John E. Webber, MB, BS, DPM, *Senior Psychiatry Registrar, Austin Hospital, Heidelberg*; Douglas J. Brown, MB, BS, FRACP, *Medical Director, Spinal Injuries Unit, Austin Hospital, Heidelberg*; Graham D. Burrows, MD, ChB, BSc, DPM, FRANZCP, FRCPsych, *Professor of Psychiatry, University of Melbourne, Department of Psychiatry, Austin Hospital, Heidelberg, Australia*

*Correspondence: *University of Melbourne, Department of Psychiatry, Austin Hospital, Heidelberg, 3084, Australia*

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