*Brit. J. Psychiat.* (1983), **143**, 554–557

# Bipolar Illness: Correlates of Dangerous Inpatient Behaviour

JEROME A. YESAVAGE

Summary: Forty male patients with bipolar affective illness were examined for factors correlating with dangerous inpatient behaviour. It was found that 63 per cent of the variance for inpatient assaults could be accounted for by a combination of a history of severe childhood discipline, a manic state, the degree of psychosis and a record of violence prior to admission. Such information may be of use in the clinical prediction of violent acts by bipolar patients, as well as suggesting ways of preventing them.

Although there have been clinical studies documenting the expression of violence by bipolar patients (Winokur *et al*, 1969), factors correlating with such episodes are unstudied.

Since identification of correlates of dangerous acts is difficult at least in part because of the lack of reliable measurements of violence (Lion, 1972; Lion *et al*, 1974; Monahan, 1981) we defined certain dependent variables, based upon inpatient dangerous behaviour, which could be measured by observer ratings. We then correlated such measures with several variables shown to be correlates of violence in other populations (Monahan, 1981) as well as with certain measures of psychopathology unique to bipolar patients. We wanted to determine whether these measures were correlated with violent behaviour by bipolar patients in hospital.

## Methods

*Subjects*

The study was conducted in the 20-bedded psychiatric intensive care unit of the Veterans Administration Medical Center, Palo Alto, California, which receives all acute psychiatric admissions there and is involved in the long-term study of violence in psychiatric inpatients. Data were collected consecutively on 40 male patients over a twelve month period. Analysis of ethnic background indicated that 31 were white, five black and four of other races. The mean age was 36.8 years. All patients met DSM III criteria for bipolar affective disorder (296.4 or 296.5, Diagnostic and Statistical Manual of Mental Disorders, Third Edition, 1980). At the time of hospitalization some patients were manic and others depressed.

*Measures of dangerousness (dependent measures)*

Instances of danger-related events on the ward were recorded for the day of admission and for seven successive days. A modification of a form developed by Student and Lion (1978) was utilized to record the number of days on which such events occurred during this 8-day period. Three variables related to dangerousness were analyzed: (a) physical assault against other patients or staff, (b) verbal assault against other patients or staff, and (c) placement in seclusion or restraint to protect others. (Nursing staff are required to chart such incidents on all shifts and to list these in summary reports). In addition to these scores, the total number of all dangerous events was computed. Surveys on this acute service indicate that approximately 15 per cent of patients commit at least one physical assault and that 60 per cent of patients have at least one rateable event during the week following admission. These ratings have an inter-judge reliability of .73 by intraclass correlation on total scores and reliabilities of all individual items were greater than .60.

*Independent variables*

*Formal psychiatric diagnosis (manic versus depressed state)*: Formal diagnosis was made in accordance with DSM III criteria. Subjects were separated according to whether they were experiencing a manic (296.4) or a depressive (296.5) episode and this was coded as a dichotomous variable.

*Brief Psychiatric Scale Ratings:* BPRS ratings were performed on admission by trained psychiatric residents and research assistants. Interrater reliability was greater than .60 on all subscales of the BPRS by intraclass correlation. A principal components analysis was performed on ratings, and five factors were identified which accounted for 73 per cent of the total variance. These factors, which were similar to those found in other studies (Overall and Klett, 1972) were derived from loadings relating to degree of psychosis (hallucinatory behaviour, conceptual disorganisation,

TABLE I
*Correlations between independent measures and inpatient dangerousness measures (N = 40)*

| Independent measures | Physical assault | Seclusion & restraint | Verbal assaults | Total acts |
|---|---|---|---|---|
| Presently manic | .36* | .37* | .38* | .57** |
| Depression factor on BPRS | −.13 | −.17 | −.07 | −.07 |
| Hostility/paranoia factor on BPRS | .23 | .12 | .16 | .11 |
| Psychosis factor on BPRS | .32* | .23 | .15 | .36* |
| Childhood discipline | .45** | .18 | .21 | .23 |
| Violence on admission | .31* | .19 | .29 | .15 |

*P <.05, **P <.01 two-tailed test (product-moment correlations)

TABLE II
*Regression of dangerousness measures with independent measures*

| Dangerousness measure | Independent measure | Multiple R squared stand. | beta |
|---|---|---|---|
| Total dangerous acts | Manic state | .32 | .68 |
| F(3,36)=4.74, P <.01 | Psychosis factor on BPRS | .40 | .32 |
| | Childhood discipline | .47 | .33 |
| Physical assaults | Childhood discipline | .21 | .64 |
| F(4,35)=8.93, P <.01 | Manic state | .42 | .55 |
| | Psychosis factor on BPRS | .53 | .24 |
| | Act prior to admission | .63 | .31 |
| Seclusion and restraint | Manic state | .14 | .34 |
| F(2,37)=3.66, P <.05 | Childhood discipline | .21 | .16 |
| Verbal assaults | Manic state | .14 | .34 |
| F(2,37)=5.45, P <.01 | Act prior to admission | .26 | .17 |

delusions and grandiosity), paranoia (hostility and suspiciousness), depression (depression and guilt), anxiety (anxiety and tension) and confusion (disorientation).

*Act leading to admission:* A scale developed by Rabiner (personal communication) was used to rate the violence of the act leading to admission on a nine point scale. This rating was based upon the patient's and the family's history as well as on the written reports of peace officers and mental health professionals involved in the admission. Inter-judge reliability of this variable was computed on the data of 28 subjects rated by each of two raters. Bartko's (1966) two-way analysis of variance was employed to compute the intraclass coefficient. An intraclass correlation of .96 was obtained.

*Childhood discipline:* The family discipline questions concerned the type and severity of discipline the patient had received as a child. Such measures have often been correlated with later assaultive potential (Monahan, 1981). Patients were asked to recall if they had been disciplined at various levels of severity (e.g. verbal discipline, spanking, beating, punishment resulting in serious injury) by each of their parents. Test-retest reliability over one week was .84 for 15 subjects by intraclass correlation on total scores.

## Results

Product-moment correlations were computed between independent variables and the dependent danger-related measures. As one can see in Table I, there are significant correlations between the independent variables and dependent variables.

In order to determine the relative importance of each independent variable a stepwise multiple regression was performed, using each dependent measure of dangerousness with each independent variable, as well as with certain demographic variable such as age, race and duration of illness as controls. Results of these analyses are presented in Table II, with the cumulative multiple $r^2$ obtained for each step and the final standardized beta weights for each independent variable entered into the regression. The cumulative multiple $r^2$ reflects the amount of additional variance explained by the independent variables as each is added to the regression equation. Independent

variables are only included if, by F test, they explain significantly more additional variance over and above what has already been explained by the variables included in the previous step. The standardized beta weights reflect the relative effect on the dependent variable of each independent variable.

Examining Table II, we find that the total score for dangerous acts has three significant correlates: manic state, degree of psychosis and childhood discipline. The factors most highly correlated with committing inpatient assaults are a history of severe childhood discipline, being in the manic state of a bipolar illness, the degree of psychosis and the degree of violence of the act leading to hospital admission. None of the dependent measures of dangerousness is significantly related to the hostility/paranoia factor. Fewer correlates are significantly related to seclusion and restraint and to verbal assaults. The total amount of variance explained by the regression models is largest for physical assaults ($r^2 = .63$) and least for seclusion and restraint ($r^2 = .21$). F values for the entire model for each dependent variable are included in the table.

## Discussion

These results are consistent with the hypothesis that bipolar patients are liable to commit assaults (Winokur *et al,* 1969). As documented by Carlson and Goodwin (1973), manic subjects are often extremely psychotic at the height of an episode, and the present study shows that they may commit assaults.

In a sample of schizophrenic patients we have observed similar results (Yesavage *et al,* 1981) using the same dependent measures. The amount of their violent behaviour was more significantly correlated with admission BPRS ratings of thought disorder and schizophrenic thinking than with ratings of hostility and paranoia. Thus in two independent samples of mental patients, with bipolar illness on the one hand and schizophrenia on the other, dangerous behaviour is more closely related to measures of psychosis than to measures of hostility.

The strong correlation between discipline and inpatient assault is of interest. In earlier work we examined this relationship in a sample of schizophrenic patients (Yesavage *et al,* in press), where the same correlation was also significant, but smaller (.21). Because our sample of manic patients is smaller than our schizophrenic sample we are unable to do factor analysis on their discipline scores and are forced to rely upon total scores in our analyses. In the schizophrenic study, however, we were able to document that discipline was often extremely severe, bordering on child abuse, and was also often imposed by the father. It appears that such violent behaviour provided patients with a model for dealing with subsequent stress.

These relationships may have practical implications for inpatient staff. Recent reports have documented the serious potential for violence in psychotic inpatients (Shader *et al,* 1977) as well as the underreporting of assaults on staff by them (Lion *et al,* 1981).Such assaults appear much more frequent than is commonly assumed. Further understanding of the hostile feelings of bipolar patients towards staff may allow better prediction of violence before it occurs, or may suggest interventions, such as abreaction, to prevent it from occurring at all.

Such results also may have implications beyond the acute treatment setting. Assessment of dangerousness is a major public concern, and the difficulties of predicting violent behaviour have been more apparent than the successes. Monahan (1981) argues that a major reason for such difficulties is the use of false predictors and a failure to utilize valid cues. The present study provides evidence that certain cues, including core symptoms of psychosis, are associated with violence in psychotics. Thus violence in such individuals might be best controlled by careful screening for such cues and timely treatment of patients exhibiting symptoms which have been empirically been shown to correlate with violence.

A final point is that our independent variables are not as well-correlated with behaviour requiring seclusion and restraint as they are with physical assaults. A prospective study recently examined in depth the correlates of seclusion episodes in an acute psychiatric unit. This study (Soloff and Turner, 1981) found that chronicity, legal status and race were the factors most highly correlated with seclusion episodes, and that mental status and diagnosis were irrelevant. In other work, not yet published (Lawson, personal communication), race was not found to bias seclusion episodes in a group of patients similar to those reported in the present study. Soloff and Turner's different findings may be due to a different patient population, since our group consisted entirely of ex-servicemen in a suburban setting while theirs drew its patients from a university medical centre in a large city. In general, one would expect that seclusion and restraint would be more difficult to predict than assault, since they involve, in addition to the patient's behaviour, a complex nursing decision.

Future work in this area should expand the collection of danger-related measures. Although there is ample evidence that bipolar patients can be violent to their families (Winokur *et al,* 1969), such data were not gathered in the present study. Lion (1978) has suggested a method to measure violence outside the individual context, and more precise predictions of violence in the family setting will await the validation of such techniques.

**Acknowledgements**

This research was supported by the Medical Research Service of the Veterans Administration and by National Institute of Mental Health specialized research centre grant MH-30854.

**References**

AMERICAN PSYCHOLOGICAL ASSOCIATION (1980) *Diagnostic and Statistical Manual of Mental Disorders,* (DSM III) Washington, D.C.: American Psychiatric Association.

BARTKO, J. J. (1966) The intraclass correlation coefficient as a measure of reliability. *Psychological Reports,* **19,** 3–11.

CARLSON, G. A. & GOODWIN, F. K. (1973) The stages of mania. *Archives of General Psychiatry,* **28,** 221–8.

LION, J. R. (1972) *Evaluation and Management of the Violent Patient: Guidelines in the Hospital and Institution.* Springfield, Illinois: Charles C. Thomas.

—— KENEFICH, D. P. & ALBERT, J. (1974) Clinical aspects of the violent individual. *American Psychiatric Association, Task Force Report 8.* Washington, D.C.: American Psychiatric Association.

—— SNYDER, W. & MERRILL, G. L. (1981) Underreporting of assaults on staff in a state hospital. *Hospital and Community Psychiatry,* **32,** 497–8.

MONAHAN, J. (1981) *The Clinical Prediction of Violent Behavior.* Washington, D.C.: United States Department of Health and Human Services.

OVERALL, J. E. & KLETT, C. J. (1972) *Applied Multivariate Analysis.* pp. 3–23, New York: McGraw Hill.

SHADER, R. I., JACKSON, A. H., HARMATZ, J. S. & APPELBAUM, P. S. (1977) Patterns of violent behavior among schizophrenic inpatients. *Diseases of the Nervous System,* **38,** 13–16.

SOLOFF, P. H. & TURNER, S. M. (1981) Patterns of seclusion: A prospective study. *Journal of Nervous and Mental Disease,* **169,** 37–44.

STUDENT, D. & LION, J. R. (1978) *Methodological Issues in Psychopharmacological Research in Violent Individuals.* Washington, D.C.: National Institutes of Medicine and International Society for Research on Aggression.

WINOKUR, G., CLAYTON, P. J. & REICH, T. (1969) *Manic Depressive Illness.* St Louis, Missouri: C. V. Mosby.

YESAVAGE, J. A., WERNER, P. D., BECKER, J. M. B., HOLMAN, C. & MILLS, M. J. (1981) Inpatient evaluation of aggression in psychiatric patients. *Journal of Nervous and Mental Disease,* **169,** 299–301.

—— BECKER, J. M. B., WERNER, P. D., PATTON, M. J., SEEMAN, K., BRUNSTING, D. W. & MILLS, M. J. (1983) Family conflict, psychopathology, and dangerous behavior by schizophrenics in hospital. *Psychiatry Research.* In press.

Jerome A. Yesavage, M.D., *Assistant Professor, Schizophrenia Biologic Research Center, Veterans Administration Medical Center, Palo Alto, California 94304 and Department of Psychiatry and Behavioral Sciences, Stanford University School of Medicine, Stanford, California 94304, U.S.A.*

*(Received 24 January; revised 18 February 1983)*