Hostility During Admission Interview as a Short-Term Predictor of Aggression in Acute Psychiatric Male Inpatients

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Background: A critical step for improving the prediction of on-ward violence is the identification of variables that are not only consistently associated with an increased risk of aggression but also easily evaluated during the admission interview. The goal of this prospective study was to assess the predictive utility of hostility during admission interview.

Method: The sample consisted of 80 newly admitted male patients with heterogeneous DSM-IV psychiatric diagnoses recruited from the psychiatric ward of an urban public hospital. Psychiatric symptoms at admission were assessed with the Brief Psychiatric Rating Scale (BPRS). Aggressive behavior during the first week of hospitalization was measured with the Modified Overt Aggression Scale. Data were collected between January and June 1998.

Results: In a multiple regression model, BPRS items hostility and tension-excitement emerged as significant predictors of verbal aggression, whereas thinking disturbance (high) and suspiciousness-uncooperativeness (low) emerged as significant predictors of aggression against objects. In contrast, when aggression was treated as a binary dependent variable in a logistic model, hostility during the admission interview had no utility in predicting on-ward aggressive behavior.

Conclusion: This study confirms the importance of distinguishing between different types of aggression to improve the accuracy of predictions of violence. The findings suggest that the question whether hostility is a useful short-term predictor of aggression in psychiatric inpatients cannot be answered conclusively. The predictive utility of hostility was relatively high for predicting verbal aggression but was negligible for predicting other types of aggressive behavior.

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The prediction of aggressive behavior by acute psychiatric inpatients is a complex problem presenting multiple difficulties for hospital staff.[1,2] Although at admission clinicians are frequently required to evaluate patients' risk of violent behavior, several studies have demonstrated that the ability of clinicians to assess potential for aggression is quite limited.[3–5]

A critical step for improving the accuracy of clinical assessment is the identification of predictors that are not only consistently associated with an increased risk of aggression but also easily evaluated during the admission interview. Hostility could be one of those predictors. According to clinical lore, patients who later will become aggressive give verbal and nonverbal cues of aggression in the form of expression of distrust, anger, irritability, and negativism,[6] and these manifestations of hostility can be easily observed and recorded during routine clinical assessment. However, studies of hostility as a short-term predictor of aggression in psychiatric inpatients have yielded conflicting results.

Hostility was found by Kay et al.[7] to be the strongest predictor of aggressive behavior in the clinical profiles of their cohort of 208 psychiatric inpatients. Palmstierna et al.[8] found that, during the first 8 days of hospitalization, violent behavior correlated with hostility in 38 involuntary admitted patients. In a sample of 226 psychiatric inpatients, McNiel and Binder[9] found that high levels of hostility at admission were associated with an increased risk of later aggression. In contrast with these findings, however, several studies have reported that in acute psychiatric inpatients, aggression may occur in the context of low overt hostility.[10–12] Such discrepant findings could be due to variations in methodology, including differences in clinical settings, diagnostic composition of patient samples, admission procedures, and stage of hospitalization.

The present prospective study was designed to address 2 additional methodological problems that have complicated the identification of short-term predictors of aggression: the measurement of aggressive behavior and the procedure of data analysis. Several studies either did not distinguish between the various types of aggression in

their inferential statistical analyses or did not address the issue at all. Such a distinction may be important for 2 reasons. First, different types of aggression could be predicted by different clinical variables. Second, although research has focused predominantly on physical aggression and severe assaultive behavior, less dramatic and more frequent forms of aggression (e.g., verbal aggression) are critical to social adjustment to the ward environment for many hospitalized patients. The problem of data analysis involves the choice between univariate and multivariate statistics. By the multivariate approach, several variables that would reach significance if analyzed one-by-one do not reach significance. Considering the multidetermined causation of aggressive behavior in the hospital setting, this statistical aspect is particularly relevant in the studies aimed at identifying predictors of aggression in acute psychiatric inpatients.[13]

METHOD

Subjects

The sample consisted of 80 newly admitted patients with heterogeneous psychiatric diagnoses recruited from the psychiatric ward of an urban public hospital. All patients were able and willing to give written consent after the study procedure was fully explained. Data were collected between January and June 1998. The sample reflected consecutive admissions (both voluntary [N = 56] and compulsory [N = 24]) of male patients with acute psychiatric symptoms. Patients with known organic syndrome and/or mental retardation were excluded from the sample. The patients had a mean ± SD age of 34.11 ± 11.06 years (range, 19–68), and their average educational level was 8.33 ± 4.03 years (range, 0–17). According to DSM-IV criteria, the 80 patients had the following diagnoses: 53 (66%), psychotic disorders (including schizophrenia); 20 (25%), mood disorders (including bipolar disorder and unipolar depression); 4 (5%), substance-related disorders; and 3 (4%), cluster B personality disorders.

Assessment of Psychopathology and Aggression

Psychiatric symptoms at admission were assessed during the diagnostic interview using the standard 18-item version of the Brief Psychiatric Rating Scale (BPRS).[14] The BPRS was rated following the instructions published by Woerner et al.[14] to improve the reliability of the scale. All patients were interviewed by the same clinical psychiatrist (S.K.). The BPRS scores used in the data analysis were the total score, the 5 factor scores (anxiety-depression, withdrawal-retardation, tension-excitement, thinking disturbance, and suspiciousness-uncooperativeness), and the score on the 7-point hostility item, defined as "animosity, contempt, belligerence, disdain for other people during the interview situation." The fifth factor of the BPRS (hostility-suspiciousness) is calculated by summing item 10 (hostility), item 11 (suspiciousness), and item 14 (uncooperativeness). However, in the present study, the hostility item was analyzed separately and the fifth factor (renamed suspiciousness-uncooperativeness) was obtained by summing items 11 and 14 only. We used this scoring procedure because our aim was to ascertain if hostility alone was a useful short-term predictor of aggression.

Aggressive behavior was measured by the Modified Overt Aggression Scale (MOAS).[15] The MOAS is an inpatient rating scale that assesses verbal aggression, aggression against objects, self-aggression, and aggression against others. Based on the assumption that the index of frequency may be a poor approximation of the severity of aggressive acts, the MOAS was not designed to provide actual counts of aggressive episodes. Instead, for each category of aggressive behavior, the rater checks the highest applicable rating point to describe the most serious act of aggression committed by the patient during the specified observation period. The MOAS provides a weighted score for each type of aggression and a weighted total score that reflects the overall seriousness of aggression.

Cross-sectional and longitudinal observations of psychiatric inpatients have documented the discriminative validity of the MOAS and its internal, interrater, and retest reliabilities.[7] In the present study, the MOAS ratings were based on daily records of patients' behavior made by treating psychiatrists and members of the primary care staff who were blind to the research objectives. Using these records, a clinical psychiatrist (S.K.) assessed the severity of aggression during the first week of hospitalization.

Statistical Analysis

Correlations between the MOAS ratings of different types of aggression were calculated using Pearson coefficient of correlation. Comparisons between groups were performed using 2-tailed t tests for continuous variables and 2-tailed chi-square tests for categorical variables. To identify the predictors of aggressive behavior, we used multivariate analysis. When aggression was treated as a binary dependent variable, logistic regression was used to predict patients' membership to either the aggressive or the nonaggressive subgroup. Multiple regression analysis was used to analyze the relative contribution of demographic and clinical predictors in influencing the MOAS score, a continuous measure of aggressive behavior. Analysis was performed on a personal computer using SPSS for Windows, version 10.0.5 (SPSS, Inc., Chicago, Ill.).

RESULTS

During the first week of hospitalization, 20 of the 80 patients committed at least 1 act of aggression. The total

Table 1. Predictors of Verbal Aggression (Measured by the MOAS) in 80 Acute Psychiatric Male Inpatients[a]

Predictor	Beta	t Value	p Value
BPRS hostility	0.32	2.30	.02
BPRS tension-excitement	0.29	2.33	.02
Involuntary admission	0.16	1.40	.17
Age	–0.10	–0.89	.37
BPRS thinking disturbance	–0.10	–0.79	.43
BPRS suspiciousness-uncooperativeness	–0.08	–0.57	.57
BPRS anxiety-depression	0.08	0.65	.52
Education	0.03	0.25	.80
BPRS withdrawal-retardation	0.03	0.21	.84

[a]Results of multiple regression analysis.
Abbreviations: BPRS = Brief Psychiatric Rating Scale, MOAS = Modified Overt Aggression Scale.

Table 2. Predictors of Aggression Against Objects (Measured by the MOAS) in 80 Acute Psychiatric Male Inpatients[a]

Predictor	Beta	t Value	p Value
Involuntary admission	0.35	3.15	.002
BPRS thinking disturbance	0.32	2.59	.01
BPRS suspiciousness-uncooperativeness	–0.30	2.10	.04
BPRS hostility	0.18	1.34	.18
Education	–0.14	–1.36	.18
BPRS withdrawal-retardation	–0.11	–0.87	.38
Age	0.09	0.84	.40
BPRS anxiety-depression	0.09	0.76	.45
BPRS tension-excitement	0.02	0.17	.86

[a]Results of multiple regression analysis.
Abbreviations: BPRS = Brief Psychiatric Rating Scale, MOAS = Modified Overt Aggression Scale.

number of aggressive episodes was 31 (20, verbal aggression; 9, aggression against objects; 2, aggression against others). Nineteen (61%) of the 31 episodes of aggression occurred during the first 3 days of hospitalization. The median day of occurrence was day 3. The MOAS mean ± SD ratings of the subgroup of aggressive patients were as follows: total score, 7.75 ± 4.62 (range, 2–19); verbal aggression, 3.20 ± 3.35 (range, 0–10); aggression against objects, 2.80 ± 3.82 (range, 0–10); and aggression against others, 1.60 ± 4.92 (range, 0–16). None of the patients committed acts of self-aggression, and only 2 committed acts of aggression against others.

The MOAS mean ratings of the different types of aggression were not intercorrelated (verbal aggression and aggression against objects, r = 0.16, N = 80, p = .16; verbal aggression and aggression against others, r = –0.06, p = .58; aggression against objects and aggression against others, r = –0.05, p = .66). Limiting the correlational analysis to the subgroup of patients who committed at least 1 act of aggression (N = 20), the results did not change (verbal aggression and aggression against objects, r = –0.29, p = .21; verbal aggression and aggression against others, r = –0.33, p = .16; aggression against objects and aggression against others, r = –0.25, p = .29).

Aggressive and nonaggressive patients did not differ in terms of age (t = 1.58, df = 78, p = .12), educational level (t = 1.25, p = .21), number of days of hospitalization (t = 0.41, p = .68), total BPRS score (t = 0.97, p = .34), and neuroleptic dosage prescribed for the first week of treatment (t = 1.55, p = .12). The rate of compulsory admission among aggressive patients (70% [14/20]) was much higher than among nonaggressive patients (17% [10/60]) (χ^2 = 20.31, df = 1, p < .0001). Physical restraint was used in 10 of the 24 involuntary admitted patients and in none of the 56 voluntary admitted patients. Physical restraint was used as a preventive procedure in 6 cases and as a response to episodes of aggression in 4 cases. The use of physical restraint was more frequent among aggressive patients (25%) than among nonaggressive patients (8.3%) (χ^2 = 3.81, df = 1, p = .05).

To ascertain if hostility during the admission interview was a useful short-term predictor of aggression during the first week of hospitalization, we performed a series of multivariate analyses. In the first model, patients were divided into 2 subgroups (aggressive and nonaggressive), and their membership to either of the 2 categories was predicted by using logistic regression. In addition to the BPRS hostility item, the independent variables entered into the model included age, educational level, admission status (coded as voluntary = 1, compulsory = 2), and the 5 BPRS factor scores (anxiety-depression, withdrawal-retardation, tension-excitement, thinking disturbance, and suspiciousness-uncooperativeness). This model correctly predicted the aggressive status for 93% (56/60) of the nonaggressive patients but for only 50% (10/20) of the aggressive patients. Hostility during the admission interview had no statistically significant effect on the aggressive status (odds ratio [OR] = 1.12, 95% confidence interval [CI] = 0.76 to 1.66, p = .57). Among the control variables, both compulsory admission (OR = 10.96, 95% CI = 2.35 to 51.02, p = .002) and tension-excitement (OR = 1.69, 95% CI = 1.17 to 2.45, p = .005) emerged as significant predictors of the aggressive status.

We performed separate multiple regression analyses with MOAS ratings (verbal aggression, aggression against objects, and aggression against others) as dependent variables. As in the logistic regression, in addition to the BPRS hostility item, the independent variables we entered into the models were age, educational level, admission status, and the 5 BPRS factor scores. Hostility and tension-excitement emerged as significant predictors of verbal aggression (Table 1). The resulting equation was significant (F = 2.49, df = 9,79; p = .02) and explained 24% (R^2) of the overall variance in the MOAS score reflecting verbal aggression. Verbal aggression was more frequent among those patients who showed higher levels of hostility and tension-excitement during the admission interview. Admission status, thinking disturbance, and suspiciousness-uncooperativeness emerged as significant predictors of aggression against objects (Table 2). The

resulting equation was significant ($F = 3.13$, $df = 9,79$; $p = .003$) and explained 29% (R^2) of the overall variance in the MOAS score reflecting aggression against objects. Aggression against objects was more frequent among involuntary patients and among patients who had higher levels of thinking disturbance and lower levels of suspiciousness-uncooperativeness at the time of admission. None of the independent variables emerged as a significant predictor of aggression against others ($F = 0.67$, $df = 7,79$; $p = .73$). However, the validity of this finding is dubious considering that only 2 patients scored positive on the MOAS scale measuring aggression against others.

DISCUSSION

Before discussing the results, we must consider 2 methodological limitations of our study. First, the sample was relatively small, did not include women, and consisted mostly of patients with acute psychotic disorders. A replication of the study in a different psychiatric population or in a sample including women might reveal different predictors of on-ward aggressive behavior. Second, the very low frequency of physical aggression in our sample did not allow us to investigate the role of hostility in predicting this severe form of violent behavior.

Werner et al.[11] suggested that there are 2 kinds of patients who become aggressive on an acute psychiatric unit. One group consists of patients whose hostile or excited behavior suggests to hospital staff the potential for violence. The other group consists of patients who do not fit this "high-visibility" profile but who are nonetheless potentially aggressive. In the present study, we found that these 2 distinct profiles predict different types of on-ward aggressive behavior. In a multiple regression model, hostility and tension-excitement emerged as significant predictors of verbal aggression, whereas thinking disturbance (high) and suspiciousness-uncooperativeness (low) emerged as significant predictors of aggression against objects. In contrast, when aggression was treated as a binary dependent variable in a logistic model (nonaggressive vs. aggressive, with all types of aggression combined), hostility during the admission interview had no utility in predicting on-ward aggressive behavior.

The association between hostility during the admission interview and on-ward verbal aggression has clinical relevance. The prediction of verbal aggression by acute psychiatric inpatients is no less important than the prediction of other and more severe forms of aggression. A large survey in the United States revealed that verbal abuse was the most common aggressive problem (72%) in a range of practice areas.[16] Verbal aggression can produce as much psychological distress for staff victims as do some physical assaults.[17,18] In addition, there is evidence that verbal aggressiveness may increase the risk of subsequent physical aggression[19,20] and may be responsive to specific drug treatment.[21] Adams and Whittington[22] suggest that there is a need to prepare nurses with strategies to address verbal assault and argue that, up until now, it is an area that has been neglected.

We found that aggression against objects was more common among patients admitted to the hospital involuntarily. This finding is consistent with reports that aggressive patients are more likely to be involuntarily hospitalized than other patients.[23,24] Barlow et al.[24] explained the association between aggression and compulsory admission as due to the fact that aggressive behavior in the context of mental disorder is one of the principal reasons for compulsory admission. Our findings suggest an additional explanation, not necessarily incompatible with that suggested by Barlow and colleagues.[24] It is possible that the association between compulsory admission and aggression against objects reflected a greater severity of the psychopathology of the patients exhibiting this on-ward behavior because they were too disorganized in their thinking to accept or recognize the need for treatment. In effect, we found that thinking disturbance (in addition to compulsory admission and lower levels of suspiciousness-uncooperativeness) was a significant and independent predictor of aggression against objects.

As with other clinical predictors, the association between thinking disturbance and aggressive behavior is not clear-cut.[25] Among acute psychiatric inpatients, Yesavage[10] found that aggressive behavior was associated with conceptual disorganization and unusual thought content, while Palmstierna et al.[8] found that aggressive behavior correlated with hostility but not with psychotic symptoms. Bjorkly recently published 2 review articles[26,27] examining the relationship between delusions, hallucinations, and violence by psychiatric patients. He concluded that, whereas there is no evidence that auditory command hallucinations are conducive to violent behavior, persecutory delusions appear to increase the risk of aggression. However, other concomitant "distress factors" such as anxiety, fear, anger, and irritability are required to trigger the violence potential of psychotic symptoms.[26]

Since our aim was limited to ascertaining the utility of hostility during admission interview as a short-term predictor of aggression, this study focused on intrapersonal variables believed to increase the risk of inpatient aggression. In reality, these "internal factors" interact with a range of environmental factors (e.g., hospital shifts, time of encounter, previous experience, type of unit, and staff training) that contribute equally to the causation of aggressive incidents. The data relating to these external factors were not collected in this study. However, the importance of environmental factors should not be underestimated, considering that patients view a "controlling style" of staff both prior to and following episodes of aggression to be a large part of the overall problem of aggressive behavior.[28]

In conclusion, these results confirm the importance of distinguishing between different types of aggression to improve the accuracy of predictions of violence. As noted by Tanke and Yesavage,[12] clinicians who consistently use the same set of criteria in making judgments about potential aggressiveness may be quite accurate in predicting the behavior of some patients and very inaccurate in predicting the behavior of others. Our findings suggest that the question whether hostility is a useful short-term predictor of aggression in psychiatric inpatients cannot be answered conclusively. In our sample of male acute patients with heterogeneous psychiatric diagnoses, the predictive utility of hostility was relatively high for predicting verbal aggression but was negligible for predicting other types of aggressive behavior.

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