

Early-Onset Substance Abuse and Community Violence by Outpatients With Chronic Mental Illness

Carl Fulwiler, M.D., Ph.D.

Hillel Grossman, M.D.

Catherine Forbes, B.A.

Robin Ruthazer, M.P.H.

Objective: This study examined the relationship between violence and substance abuse among patients with chronic mental illness living in the community. **Methods:** All referrals over a one-year period to an urban assertive community treatment team were evaluated systematically with a standardized intake protocol. Thirty-seven patients with a history of violence in the community were compared with 27 patients without such a history on a variety of clinical and demographic variables. **Results:** More than half of the patients (58 percent) had a history of violence in the community. The only significant differences between those with a history of violence and those without involved alcohol or drug use. The single best predictor of violence was the onset of alcohol or drug abuse in late childhood or early adolescence. **Conclusions:** In this sample, very early onset of substance abuse among people who developed mental illness was associated with the greatest risk of community violence. Thus at least some of the causal determinants of violence in this sample may precede the onset of adult mental illness. (*Psychiatric Services* 48:1181–1185, 1997)

Recent studies have consistently found that violence is more common among people with mental illness compared with the general population (1–3). This finding contrasts with earlier studies, illustrated in Rabkin's review (4) of the older literature. Although the violence attributed to mentally ill persons accounts for only a small fraction of the violence in our society (5), it is a major reason for psychiatric hospitalization and involuntary commitment (6,7).

The Epidemiologic Catchment Area (ECA) study used structured interviews to survey the prevalence of psychiatric illness in a large, unselected sample of the United States population (8). A separate analysis of the survey responses pertaining to violent behavior revealed that the lifetime prevalence of violence among people with either schizophrenia or major affective disorder was almost double the rate among people without these conditions (1).

In a large, unselected birth cohort

in Sweden, Hodgins (3) examined national registries to identify those who developed mental illness and those registered as committing crimes by age 30. Of the subjects with major mental illness, 14.6 percent had been arrested for a violent crime, compared with 5.7 percent of subjects without major mental illness. Lindqvist and Allebeck (9) did a 15-year follow-up study of a population-based cohort of all inpatients with a diagnosis of schizophrenia who were discharged from hospitals in Stockholm in 1971 (N=664). They used criminal registries to determine the number of arrests. The incidence of violent crimes was four times higher than in the general population.

The increased risk for violence among persons with mental illness remains significant when demographic factors and socioeconomic status are taken into account (1,3). The reasons for the increased risk of violence associated with mental illness are not known. A major risk factor is substance abuse. In the ECA study, substance abuse almost doubled the lifetime prevalence of violence among persons with mental illness (1). In the Swedish birth cohort, alcohol or drug abuse was present among 48.7 percent of the violent group of mentally ill persons (3). In the long-term follow-up of patients with schizophrenia in Sweden, 55 percent of the patients registered for violence during the follow-up period had definite or probable alcohol abuse (10).

These findings have led some re-

Dr. Fulwiler, Dr. Grossman, and Ms. Forbes are affiliated with the department of psychiatry at Tufts University School of Medicine and New England Medical Center in Boston. Ms. Ruthazer is with the division of clinical care research of the Tufts University School of Medicine in Boston. Address correspondence to Dr. Fulwiler at the Department of Psychiatry, MS 1007, New England Medical Center, 750 Washington Street, Boston, Massachusetts 02111. An earlier version of this paper was presented at the Institute on Psychiatric Services held October 6–10, 1995, in Boston.

Table 1

Demographic and clinical characteristics of violent and nonviolent patients with chronic mental illness

Characteristic	Violent (N=37)	Nonviolent (N=27)	Value	df	p ¹
Age (mean±SD years)	37.16±7.79	46.33±12.77	t=3.56	62	.001
Education (mean±SD years)	9.77±2.32	10.41±2.72	t=.98	59	ns
Age at first psychiatric diagnosis (mean±SD years)	20.21±6.30	31.73±16.19	t=3.70	56	.000
Duration of illness (mean±SD years)	16.65±9.68	14.00±9.67	t=-1.05	58	ns
Male (%)	86.5	51.9	$\chi^2=9.2$	1	.002
Homeless at intake (%)	70.3	40.7	$\chi^2=5.58$	1	.018
History of a suicide attempt (%) ²	57.1	22.2	$\chi^2=7.63$	1	.006

¹ Raw p values. Applying the Bonferroni correction for possible type I error, a raw p value of <.001 is significant at p<.05 level.² Data not available for two subjects

searchers to conclude that the increased rate of violence among mentally ill persons can largely be attributed to the subgroup with comorbid substance abuse disorders (11). However, whether substances make people with mental illness more violent or whether both substance abuse and violence are increased in a particular subgroup of mentally ill persons is unknown.

The purpose of the study reported here was to further explore the relationship between substance abuse and violence among people with chronic mental illness in an effort to identify clinical or demographic factors that might define a more homogeneous subgroup with the highest risk.

Methods

Subjects for this study were all referrals over a one-year period (September 1, 1994, to August 31, 1995) to the Baycove–New England Medical Center community treatment team. The community treatment team serves the Baycove Mental Health Center catchment area in Boston, comprising primarily low-income inner-city neighborhoods. The community treatment team is contracted by the state to provide intensive community-based mental health services, following the model of the Program for Assertive Community Treatment developed in Madison, Wisconsin (12,13).

Referrals are made by state mental health agencies. To be eligible for the program, patients must have severe mental illness and must have required multiple hospitalizations during the previous two years. A total of

90 patients were referred to the program during the study period. Twenty-six either were never located or had to be excluded for lack of sufficient information because they refused to be interviewed and records were not available. The final sample consisted of 64 patients.

Clinical and demographic data were collected using a standardized intake protocol administered by one of the two psychiatrists on the research team (CF or HG). The protocol included a semistructured interview, an interview of a family member when possible, and a review of all available hospital and outpatient records. Arrest records were available for 12 subjects. Diagnoses were made by the interviewing psychiatrist using *DSM-IV* criteria (14).

For this study, violence was defined as committing physical or sexual battery against another person in the community, excluding acts of self-defense. Only incidents that occurred after age 18 and after the patient had received a psychiatric diagnosis, or that led directly to the first psychiatric diagnosis, were counted. Inpatient assaults were excluded because staff practices have been shown to influence the incidence (15) and reporting (16) of such events. The sources for this information on violence included self-report, a careful review of all available psychiatric records, and, when possible, a review of criminal records. Threats of violence or assault without physical contact were not counted.

Patients with a history of violence were compared with the remaining patients on clinical and demographic variables. Continuous variables were

analyzed using t tests, and chi square tests were performed on dichotomous variables. The results are presented as raw p values. Possible type I error is also discussed in terms of a conservative Bonferroni correction for the number of variables examined (a total of 50 variables), considering a corrected p value of <.05 as significant. Logistic regression was used to examine multivariate relationships among variables pertaining to mental illness and substance abuse. The software used for statistical analysis was SAS, version 6.12 for Windows.

Results

The mean±SD age of the sample was 41±11 years. Seventy-one percent were male, and 58 percent were homeless. Forty-six percent were Caucasian, and 43 percent were African American. The mean±SD number of years of education was 10±2.5.

Psychiatric diagnoses were schizophrenia, for 36 percent; bipolar I disorder, for 19 percent; schizoaffective disorder, for 11 percent; substance abuse, for 11 percent; severe personality disorder, for 6 percent; adult attention deficit disorder and bipolar II disorder, each for 3 percent; and dementia, major depression with psychotic features, obsessive-compulsive disorder, and mood disorder due to a general medical condition, each for 1.5 percent. Seventy-seven percent of the sample had a history of an alcohol or drug use disorder. Patients who fulfilled criteria for both a mental illness and a substance use disorder were considered to have dual diagnoses. For 16 percent of the refer-

rals, a mood or psychotic disorder was considered to be substance induced.

A history of interpersonal violence in the community after the onset of adult mental illness was common in the sample (58 percent), and the most common victims were nonrelatives. The most frequent act of violence was simple battery. Twenty-two percent of patients used a weapon, and 8 percent committed rape or attempted rape. One patient had been charged with attempted murder. All violent subjects had more than one documented instance of violence as defined; most had three or more incidents.

As Table 1 shows, violent patients were more likely to be male, to have a history of a suicide attempt, and to be homeless and younger at the time of referral. They were also younger when their mental illness was first diagnosed, but the length of illness was the same as for nonviolent patients. Making a conservative correction for type I error, only age at first diagnosis remained significant (corrected p value $<.05$).

Table 2 shows the *DSM-IV* diagnoses of violent and nonviolent patients. No significant differences were found in the rate of violence within diagnostic groups. However, a history of a comorbid substance use disorder—substance abuse or dependence—appeared to be strongly associated with an increased risk of violence.

The contribution of substance disorders to the risk of violence in people with mental illness was further explored by grouping psychiatric dis-

Table 2

DSM-IV psychiatric diagnoses of violent and nonviolent patients with and without a history of substance abuse

Diagnosis	Violent (N=37)			Nonviolent (N=27)		
	Total	Substance abuse		Total	Substance abuse	
		Yes	No		Yes	No
Schizophrenia	11	10	1	12	2	10
Bipolar I disorder	6	6	0	6	4	2
Schizoaffective disorder	6	6	0	1	0	1
Substance dependence	6	—	—	1	—	—
Alcohol dependence	2	—	—	1	—	—
Attention-deficit/hyperactivity (adult)	2	2	0	0	—	—
Dementia	1	1	0	0	—	—
Major depressive disorder	1	1	0	0	—	—
Bipolar II disorder	0	—	—	2	2	0
Obsessive-compulsive disorder	0	—	—	1	0	1
Personality disorder not otherwise specified	0	—	—	1	0	1
Mood disorder due to medical condition	0	—	—	1	0	1
Borderline personality	2	1	1	1	0	1

orders into two categories—major mental illness, consisting of schizophrenia, schizoaffective disorder, bipolar disorder, and major depressive disorder; and other diagnoses. Overall, patients with major mental illness were not significantly more likely to be violent than patients with other diagnoses (52 percent versus 56 percent). Major mental illness alone, with no history of alcohol or drug abuse, was associated with a significantly lower risk of violence (Table 3). Only 7 percent of patients with major mental illness alone had a history of violence, compared with 73 percent of patients who had both a major mental illness and a history of substance abuse. The effect of a history of substance abuse was similar

for patients with major mental illness and those with other disorders. Thus in this sample mental illness was not associated with violence unless it was accompanied by a history of substance abuse.

As for the contribution of major mental illness to the risk of violence associated with substance abuse, the rate of violence was similar whether major mental illness was present or not (Table 3). To examine this relationship further, we performed a logistic regression that included the factors major mental illness and substance abuse and the interaction between them. We found no evidence of an interaction between major mental illness and substance abuse. On the other hand, controlling for

Table 3

Major mental illness and alcohol and drug abuse among violent and nonviolent patients

Variable	Violent (N=37)		Nonviolent (N=27)		χ^2	p^1
	N	%	N	%		
Any major mental illness	25	52	23	48	2.58	ns
Major mental illness with alcohol or drug abuse	24	73	9	27	6.21	.01
Major mental illness without alcohol or drug abuse	1	7	14	93	21.01	<.001
Any alcohol or drug abuse	35	75	12	25	20.13	<.001
Alcohol or drug abuse without major mental illness	6	86	1	14	2.51	ns
Onset of alcohol or drug abuse before age 15 ²	21	91	2	9	18.93	<.001

¹ Raw p values; $df=1$ for all comparisons. Applying the Bonferroni correction for possible type I error, a raw p value of $<.001$ is significant at $p<.05$ level.

² Data not available for four subjects

major mental illness, the effect of any alcohol or drug abuse was highly significant (odds ratio=26, 95 percent confidence interval=5.1 to 136, $p<.001$).

To address the primary goal of this study, we looked for variables among patients with a history of substance abuse that might identify a subgroup at increased risk. In particular, we hoped to find variables that might prove useful in predicting, before the onset of a major mental illness, who would later be violent. We noticed that many patients had begun abusing substances very early, in their early teens or younger. Therefore, we divided the sample into patients who had begun abusing substances before age 15—the early-onset group—and the rest of the sample. We felt that patients' recall was not precise enough to treat age of onset as a continuous variable.

As Table 3 shows, patients who had begun substance abuse before age 15 were far more likely to become violent after the onset of mental illness. We did another logistic regression analysis, controlling for major mental illness and using early onset of substance abuse in the model. We compared the ability of this model to correctly classify patients as violent or nonviolent with that of the model using adult-onset substance abuse. Both models performed well, but the area under the curve was larger for the model using early onset of substance abuse ($c=.81$ versus $.79$). The addition of other factors did not significantly improve the model's performance. Thus in this sample a pre-morbid characteristic—onset of substance abuse before age 15—was a better predictor of violence after the onset of mental illness than was adult-onset substance abuse.

Discussion

Consistent with previous research on violence associated with mental illness (1,3,10), substance abuse was a major risk factor in this sample of people with severe, chronic mental illness. The type of mental illness was not significant, but mental illness appeared to begin earlier for violent patients. Alternatively, because we examined only the age at first di-

agnosis, the latter finding might not reflect earlier onset of symptoms because violent behavior may have brought these patients to the attention of the mental health system earlier.

We were interested in whether all people with mental illness who abused substances had a similar risk of violence or whether the risk might be higher in a more homogeneous subgroup. The most interesting finding in our study was that a characteristic that preceded the development of a major mental illness by several years—the onset of alcohol or drug abuse before age 15—was the strongest risk factor for violence. This finding, if confirmed, would have important implications for how we view the relationship between substance abuse and violence among people with mental illness.

Despite the consistency of the association of substance abuse with violence, the nature of this relationship remains unclear. For people with major mental illness, both direct and indirect mechanisms have been proposed (11,17). One theory is that substance abuse causes some psychiatric patients to be violent, possibly as a result of increasing the severity of their psychotic symptoms (11). However, violence is also strongly associated with substance abuse among people without mental illness, and although alcohol or drugs may lower inhibitions, most people do not become violent when intoxicated.

Despite numerous studies, it has not been possible to clearly demonstrate that substance abuse causes violence (Reiss and Roth [18] and Miczek and associates [19] review that relationship). The best information we have about the relationship between substances and violence is for alcohol. Studies of alcoholics that include longitudinal data have found that the risk of violence is strongest when there is a history of both aggressiveness and alcohol abuse in childhood or early adolescence (19). In addition, violence has been shown to be specifically associated with the early-onset type of alcoholism (20, 21). Thus substance abuse and a tendency toward violence may both be

determined by factors operating in early life.

Our finding that the risk of violence among people with mental illness is greatest when substance abuse begins before age 15 is the first evidence we are aware of that early-life antecedents are significant predictors of violence associated with adult mental illness. In a birth cohort study, Hodgins (3) found that persons with mental illness who were convicted of a crime were more likely to have abused substances in childhood or early adolescence, but no specific mention of violent crime in relation to this finding was made.

Other factors that have been reported to be associated with violence among persons with mental illness—homelessness (22), age and gender (23–25), and history of suicide attempts (26)—were not significantly more frequent in our group of violent patients if we controlled for type I error. Psychiatric diagnosis did not differentiate the violent patients from the nonviolent patients in our study, in contrast to other studies (17,24). In our retrospective study we could not assess either the severity or the type of psychotic symptoms, which have previously been found to be important risk factors (2). We also did not examine other reported risk factors, such as neurological impairment (27) and noncompliance with treatment (28). Our sample size may explain the failure to corroborate reports of other risk factors.

Overall, the contribution by people with major mental illness to the problem of violence in our society is small (1,5). However, among people receiving treatment for chronic mental illness, in which the rate of substance abuse is high (8), violence is a serious problem. Among the patients in our study, 58 percent had a history of violence since the onset of illness. If our findings are confirmed, it would be possible to identify a subgroup of persons with mental illness who abuse substances and who are at higher risk for violence.

Furthermore, our results suggest it may be possible to predict at the outset of mental illness who will be at

risk for later violence based on pre-morbid history. This ability could have important implications for efforts to reduce the risk of violence associated with mental illness. Efforts toward the prevention and treatment of substance abuse in this patient population will be important but may not be enough. Our ability to predict, prevent, and treat violence will depend on a better understanding of the link between substance abuse and violence. An area for future study is whether the neuropsychological impairment reported to be associated with violence in the general population (29,30) and among mentally ill offenders (31,32; Fulwiler and associates, unpublished manuscript, 1997) could be related to the effects of early substance abuse on normal maturation of cognitive or neural functions.

The findings reported here cannot be generalized until they are confirmed with a larger unselected sample using structured interviews administered by investigators who are blind to the subject's history of violence. The subjects for this study were a selected group, as referrals to the community treatment team must be refractory to standard outpatient care. Also we may have misclassified some patients as nonviolent if they did not report the violent behavior and the available records were incomplete. Finally other historical information, such as age of onset and previous history of substance abuse, could also be unreliable in some cases. Finally, structured interviews were not used to make the diagnoses.

Conclusions

The rate of previous violence in the patients referred to a community treatment team serving low-income, inner-city neighborhoods in Boston was high, as was the rate of substance abuse. The most interesting finding was that a history of substance abuse beginning in late childhood or early adolescence was a better predictor than adult-onset substance abuse in discriminating violent from nonviolent patients. This finding has implications for risk assessment and management of outpa-

tients with serious mental illness and substance abuse. Further study will be needed to determine if our finding extends to other psychiatric populations. ♦

References

- Swanson J, Holzer C, Ganju V, et al: Violence and psychiatric disorder in the community: evidence from the Epidemiologic Catchment Area surveys. *Hospital and Community Psychiatry* 41:761-770, 1990
- Link BG, Andrews HA, Cullen FT: The violent and illegal behavior of mental patients reconsidered. *American Sociological Review* 57:275-292, 1992
- Hodgins S: Mental disorder, intellectual deficiency, and crime. *Archives of General Psychiatry* 49:476-483, 1992
- Rabkin J: Criminal behavior of discharged mental patients: a critical review of the research. *Psychological Bulletin* 86:1-27, 1979
- Monahan J: Mental disorder and violent behavior: attitudes and evidence. *American Psychologist* 47:511-521, 1992
- Beck J, White K, Gage B: Emergency psychiatric assessment of violence. *American Journal of Psychiatry* 148:1562-1565, 1991
- McNiel DE, Myers RS, Zeiner HK, et al: The role of violence in decisions about hospitalization from the psychiatric emergency room. *American Journal of Psychiatry* 149:207-212, 1992
- Robins LN, Regier DA: *Psychiatric Disorders in America*. New York, Free Press, 1991
- Lindqvist P, Allebeck P: Schizophrenia and crime: a longitudinal follow-up of 644 schizophrenics in Stockholm. *British Journal of Psychiatry* 157:345-350, 1990
- Lindqvist P, Allebeck P: Schizophrenia and assaultive behavior: the role of alcohol and drug abuse. *Acta Psychiatrica Scandinavica* 82:191-195, 1989
- Torrey EF: Violent behavior by individuals with serious mental illness. *Hospital and Community Psychiatry* 45:653-662, 1994
- Stein L, Test M: Alternative to the hospital: a controlled study. *American Journal of Psychiatry* 132:517-522, 1975
- Stein L, Test M: Alternative to mental hospital treatment: I. conceptual model, treatment program, and clinical evaluation. *Archives of General Psychiatry* 37:392-397, 1980
- Diagnostic and Statistical Manual of Mental Disorders, 4th ed. Washington, DC, American Psychiatric Association, 1994
- Shader R, Jackson A, Harmatz J, et al: Patterns of violent behavior among schizophrenic inpatients. *Diseases of the Nervous System* 38:13-16, 1977
- Convit A, Isay D, Gardioma R, et al: Underreporting of physical assaults in schizophrenic inpatients. *Journal of Nervous and Mental Disease* 176:507-509, 1988
- Volavka J: *Neurobiology of Violence*. Washington, DC, American Psychiatric Press, 1995
- Reiss AJ Jr, Roth JA (eds): *Understanding and Preventing Violence: Panel on the Understanding and Control of Violent Behavior*. Washington, DC, National Academy Press, 1993
- Miczek KA, DeBold JF, Haney M, et al: Alcohol, drugs of abuse, aggression, and violence, in *Understanding and Preventing Violence, Vol 3: Social Influences*. Edited by Reiss AJ Jr, Roth JA. Washington, DC, National Academy Press, 1994
- Cloninger CR, Bohman M, Sigvardsson S: Inheritance of alcohol abuse: cross-fostering analysis of adopted men. *Archives of General Psychiatry* 38:861-868, 1981
- Virkkunen M, Linnoila M: Brain serotonin, type II alcoholism, and impulsive violence. *Journal of Studies on Alcohol* 11(suppl):163-169, 1993
- Martell DA, Rosner R, Harmon RB: Base-rate estimates of criminal behavior by homeless mentally ill persons in New York City. *Psychiatric Services* 46:596-601, 1995
- Tardiff K, Koenigsberg H: Assaultive behavior among psychiatric outpatients. *American Journal of Psychiatry* 142:960-963, 1985
- Krakowski M, Volavka J, Brizer D: Psychopathology and violence: a review of literature. *Comprehensive Psychiatry* 27: 131-148, 1986
- Kay S, Wolkenfeld F, Murrill L: Profiles of aggression among psychiatric patients: II. covariates and predictors. *Journal of Nervous and Mental Disease* 176:547-557, 1988
- Virkkunen M, DeJong J, Bartko J, et al: Psychobiological concomitants of history of suicide attempts among violent offenders and impulsive fire setters. *Archives of General Psychiatry* 46:604-606, 1989
- Krakowski M, Convit A, Jaeger J, et al: Inpatient violence: trait and state. *Journal of Psychiatric Research* 23:57-64, 1989
- Bartels J, Drake R, Wallach M: Characteristic hostility in schizophrenic outpatients. *Schizophrenia Bulletin* 17:163-171, 1991
- Mungas D: An empirical analysis of specific syndromes of violent behavior. *Journal of Nervous and Mental Disease* 171:354-361, 1983
- Mungas D: Psychometric correlates of episodic violent behavior: a multidimensional neuropsychological approach. *British Journal of Psychiatry* 152:180-187, 1988
- Krakowski M, Convit A, Jaeger J, et al: Neurological impairment in violent schizophrenic inpatients. *American Journal of Psychiatry* 146:849-853, 1989
- Krakowski MI, Czobor P: Clinical symptoms, neurological impairment, and prediction of violence in psychiatric inpatients. *Hospital and Community Psychiatry* 45: 700-705, 1994