

Criminal Recidivism and Family Histories of Schizophrenic and Nonschizophrenic Fire Setters: Comorbid Alcohol Dependence in Schizophrenic Fire Setters

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Life-time criminality, family history, and situational factors during a fire-setting offense were compared between 44 fire setters who had been diagnosed with schizophrenia or delusional psychosis and 260 nonpsychotic fire setters who had undergone a pretrial forensic psychiatric evaluation. The same comparisons were made between alcoholic (n = 25) and nonalcoholic (n = 19) schizophrenic fire setters. Medical and criminal records were studied. Life-time criminal histories of schizophrenic and nonschizophrenic fire setters were not significantly different with respect to multiple fire setting and violent offenses. Nonschizophrenic and alcoholic schizophrenic fire setters had, in general, a high rate of criminal offenses. The family history of schizophrenic fire setters was often characterized by the father's alcoholism and the mother's psychosis. Comorbid familial alcoholism increased life-time criminal recidivism among schizophrenic fire setters.

The proportion of schizophrenic patients among fire setters has been reported to range from 10 to 30 percent.^{1,2} In forensic psychiatric pretrial samples, this proportion has not varied very much during the past 50 years.^{3,4} In recent pretrial samples, the proportion of psychotic patients among fire setters has again ranged between 20 and 30 percent.⁵⁻⁷

In Western countries, substance abuse

and alcohol dependence seem to be found more commonly among schizophrenic patients than among the general population.⁸⁻¹¹ The prevalence of alcohol abuse has been found to vary between 20 and 25 percent among schizophrenic patients.⁸⁻¹¹ Comorbid conditions such as substance use with schizophrenia and antisocial personality disorder have been found to correlate with disadvantaged family background, school difficulties, early drug use, and hyperactivity.¹² The rates of these comorbidities have not been very commonly known until the present. The number of psychotic patients who do

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not meet diagnostic criteria for schizophrenia may be increasing among fire setters, and alcohol dependence and substance abuse are very common diagnoses in this population.¹³

Alcohol dependence has been reported among 40 to 60 percent of fire setters, and the fire-setting offense is often committed during intoxication.^{1, 7, 14} Intoxication while setting fires may not be as common among schizophrenic fire setters. In Finland 20 years ago, the incidence of intoxication among schizophrenic fire setters was 13 percent compared with 70 percent among fire setters in general.¹⁵ The incidence of alcohol and substance abuse may be increasing among schizophrenic fire setters.^{13, 16} Recently, a pretrial sample was described that consisted of more than 86 percent psychotic patients and 24 percent substance abusers, with overlapping diagnoses.¹³ Although the majority of patients in these samples has been men, the comorbidity of schizophrenia, alcohol abuse, impulsiveness, inability to control anger, and fire setting also has been reported among a sample consisting of women only.¹⁶

The family history of fire setters, in general, has been found to be characterized by alcoholism and multiple psychosocial problems.^{1, 17, 18} Familial alcoholism and impulse control disorder have been reported among fire setters with low cerebrospinal 5-hydroxyindoleacetic acid (5HIAA).^{18, 19} Family histories of schizophrenic fire setters has seldom been reported.²⁰ The prevalence of alcohol abuse and dependence has been found to be significantly greater in biological relatives of schizophrenic adoptees than in

controls,²¹ and the prevalence of schizophrenia is higher among the biological relatives of schizophrenics in general than in the relatives of nondisordered controls.²² These aspects have not been investigated among criminal schizophrenic patients.

Fire setters are a heterogeneous group many of whom have exhibited prior delinquent activities, although violent offenses have been rare.²³ Previous "anti-social activities" were found among 65 percent of imprisoned fire setters and among 27 percent of hospitalized fire setters.¹⁷ Crimes against property, other than arson, commonly have been found.²⁴ A history of injurious behavior to others was reported in one-third of hospitalized psychotic patients who had set fires.²⁵ A history of fire setting has been found to vary between 28 percent^{1, 26} and 40 percent.^{5, 27} In follow-up studies, the incidence of fire setting recidivism has varied widely: Soothill and Pope²⁸ found recidivist offenses among 4.5 percent during a 20-year follow-up study, whereas O'Sullivan and Kelleher¹⁷ found 35 percent of recidivist offenses during a 5-year follow-up. The rate of recidivist fire setting among 50 state hospital patients with a history of fire-setting behavior was found to be 28 percent during 6.75 years of follow-up.²⁵ Of 279 state hospital patients, 17.6 percent had a life-time history of fire setting, and 42.8 percent had committed more than one fire-setting offense.²⁹

Among impulsive fire setters in general, the following characteristics are predictors of a high rate of recidivist criminal offenses: a low concentration of 5HIAA

and low blood glucose nadir during an oral glucose tolerance test³⁰; a history of suicide attempts; young age at the time of release from prison; and mother's the alcoholism.³¹

Schizophrenic men have been found to have a higher risk of violent behavior than the general population.³² That high risk, however, seems to be due to alcohol abuse.³³ Antisocial personality disorder, which increases the risk of criminal behavior, has been found to be common among first-degree relatives of schizophrenic patients, and schizophrenia in the biological parents increases the risk of criminal behavior in the offspring.^{34, 35} Conventionally, the number of previous offenses has been considered the best predictor of subsequent offenses among hospital order patients in general.³⁶ The above-mentioned demographic and biological variables have not been investigated among schizophrenic fire-setting patients.

Aims of This Study

The goal of this study was to compare schizophrenic and nonschizophrenic fire setters and alcoholic and nonalcoholic schizophrenic fire setters in the areas of life-time criminality (all criminal offenses committed since the age of 15), criminal offenses subsequent to the index arrest, family histories, targets of the index fire-setting offense, and the incidence of alcohol intoxication during the fire-setting offense.

Subjects and Methods

The hospital records of 304 accused (and subsequently convicted) male fire

setters referred for a forensic psychiatric evaluation to the Department of Forensic Psychiatry at Helsinki University Central Hospital in 1978 to 1991 were examined for psychiatric diagnoses using the DSM-III-R criteria.³⁷ Thirty-nine were diagnosed with schizophrenia and five with delusional psychosis; these patients ($n = 44$) were studied as one group, referred to here as "schizophrenic."

The schizophrenic patients were evaluated at the age of 31.4 ± 10.1 years, the others at the age of 33.3 ± 11.5 years. The mean ages of the groups do not differ significantly from each other. Total intelligence quotient (IQ) was determined according to the Wechsler Adult Intelligence Scale (WAIS). The mean total IQ was within normal range for both groups (95.1 ± 17.7 and 95.9 ± 16.7 , respectively). Twenty-five of the schizophrenic patients fulfilled the diagnostic criteria for alcohol dependence. The alcoholic schizophrenic patients were 33.2 ± 9.9 and the nonalcoholic schizophrenic patients 28.9 ± 10.2 years old during the evaluation. Their mean total IQs were within the normal range (91.5 ± 13.9 and 99.3 ± 21.0 , respectively).

The criminal register of Finland was searched for all criminal offenses committed by these subjects since the age of 15. The variables—fire setting, violence, property and drunken driving offenses—were formulated to describe life-time criminality. The age of the offenders on committing their first crime was obtained from the criminal register.

Family history was obtained using a structured questionnaire that was sent to all living first-degree relatives of the fire

setters. It contains 12 groups of questions concerning (1) relatives; (2) parents; (3) second-degree relatives; (4) siblings; and (5) offspring. It elicits information concerning physical and mental health, substance abuse and alcoholism, criminality, and time and cause of death. Concerning the offender, it queries about (6) development and behavior up to the age of 14; (7) circumstances at home, including discipline, parenting, separations, and divorces; (8) education, including interests, strengths and weaknesses, absenteeism, and discipline (this information is checked against official school records); (9) employment history, including unemployment; (10) mandatory military service (this information is checked against official military records); (11) character as an adult; and (12) unusual or disturbed behaviors after the age of 14. This questionnaire has been an integral part of the forensic psychiatric evaluation administered at this clinic for the past 25 years. A condition or behavior in a relative was accepted as positive when reported independently by a minimum of two other relatives.

The information concerning targets set on fire and alcohol intoxication during the offense were obtained from the police records, at the time of the forensic psychiatric evaluation.

The computer program Systat for Windows 4.0 was used for statistical analyses. The chi-square test with Yates' correction, Fisher's exact test, and the Mann-Whitney *U* test were applied as appropriate. A probability level of .05 was considered significant.

Results

Alcohol dependence, significantly more common among the nonschizophrenic than among the schizophrenic fire setters, was 77.3 percent and 56.8 percent, respectively ($\chi^2 = 7.243$, $p = .007$).

The schizophrenic and other fire setters had started their criminal careers at similar ages, 28.2 ± 10.5 and 28.0 ± 11.7 years, respectively. The first (or only) fire setting among both groups had taken place close to the age of 30, 29.6 ± 10.4 and 31.8 ± 11.3 years, respectively. The nonalcoholic schizophrenic patients had committed their first criminal offense at the age of 28.2 ± 10.8 years and the alcoholic schizophrenics at the age of 28.2 ± 10.5 years.

A total of 63.6 percent of the schizophrenic patients and 80 percent of the other fire setters had committed additional criminal offenses; this was a significant difference (Table 1). Alcoholic schizophrenic patients had committed additional crimes more often than nonalcoholic schizophrenics (72% and 52%, respectively), but the difference did not reach statistical significance. Life-time fire-setting recidivism was 32 percent among the nonschizophrenic and 26 percent among the schizophrenic fire setters. This difference was not significant. The proportion of recidivist fire setters among alcoholic schizophrenic patients was higher than that among the nonalcoholic schizophrenics (30% and 21%, respectively), but the difference did not reach a level of significance (Table 1).

With respect to life-time violent offenses, there was no significant difference

Schizophrenia, Fire Setting, and Criminal Recidivism

Table 1
Prevalence of Life-Time Recidivism^a

	Nonschizo- phrenic (n = 260) %	Schizo- phrenic (n = 44) %	χ^2	<i>p</i>	Non- alcoholic (n = 19) %	Alcoholic Schizo- phrenic (n = 25) %	χ^2	<i>p</i>
Recidivist offenders	82.9	63.6	7.413 ^b	0.006**	52.6	72.0	1.013 ^b	0.314
Violent recidivists	42.5	27.9	2.650 ^b	0.104	10.5	41.7	3.681 ^b	0.055
Fire-setting recidivists	32.0	26.2	0.326 ^b	0.568	21.1	30.4	†	0.726
Number of drunken driving offenses								
0	45.8	67.4			73.7	62.5		
1	25.4	23.3			21.1	25.0		
≥2	28.8	9.3	8.881 ^c	0.012*	5.3	12.5	0.901 ^c	0.649
Number of property crimes								
0	45.4	64.3			84.2	47.8		
1-4	27.9	23.8			5.3	39.1		
≥5	26.7	11.9	6.043 ^c	0.049*	10.5	13.0	7.210 ^c	0.027*

^a Prevalence in all criminal offenses, violent and fire setting offenses, and prevalence of life-time drunken driving offenses and property crimes among nonschizophrenic, schizophrenic, nonalcoholic schizophrenic, and alcoholic schizophrenic fire setters.

^b Chi-square test, *df* = 1.

^c Chi-square test, *df* = 2.

*, *p* < .05; **, *p* < .01; †, Fisher's exact test.

between the schizophrenic and non-schizophrenic fire setters. The proportions were 27.9 percent and 42.5 percent, respectively (Table 1). Alcoholic schizophrenic patients had committed violent offenses four times as often as the nonalcoholic schizophrenics (41.7% and 10.5%, respectively). The difference showed a strong trend toward significance (Table 1). None of the nonalcoholic schizophrenics had committed more than one violent offense.

Multiple crimes against property (other than fire setting) were committed significantly more often by the nonschizophrenic fire setters (Table 1). The alcoholic schizophrenic patients had committed property crimes significantly

more often than the nonalcoholic schizophrenic patients (Table 1).

The family histories of the alcoholic schizophrenic fire setters were significantly more often characterized by the father's alcoholism (68%) than that of nonalcoholic schizophrenics (31.6%), although among all groups, paternal alcoholism and violence were common. A family history positive for maternal psychosis was found in 22.7 percent of the schizophrenic patients; it was significantly more common than among the other fire setters (3.5%) (Table 2).

As the index offense, of all groups about 40 percent had set fire to their own apartments (nonschizophrenic fire setters, 44.6%; schizophrenic, 43.2%; alcoholic

Table 2
Family Histories of Nonschizophrenic and Schizophrenic, and Nonalcoholic and Alcoholic Schizophrenic Fire Setters^a

	Nonschizo- phrenic (n = 260) %	Schizo- phrenic (n = 44) %	χ^2	<i>p</i>	Non- alcoholic (n = 19) %	Alcoholic Schizophrenic (n = 25) %	χ^2	<i>p</i>
Father								
Alcoholic	46.5	52.3	.293	.588	31.6	68.0	4.373	.037*
Violent	30.0	38.6	.935	.333	26.3	48.0	1.324	.250
Violent alcoholic	27.7	36.4	.986	.321	21.1	48.0	2.323	.127
Psychotic	2.7	6.8	†	.163	10.5	4.0	†	.570
Depressive	2.7	0			0	0		
Suicide	2.7	6.8	†	.163	5.3	8.0	†	1.0
Dead ^b	14.6	6.8	1.349	.245	5.3	8.0	†	1.0
Absent	19.2	31.8	2.870	.090	26.3	36.0	0.127	.722
Criminal	10.0	4.6	†	.396	10.5	0		
Mother								
Depressive	4.2	2.3	†	1.0	0	4.0		
Alcoholic	6.9	6.8	†	1.0	5.3	8.0	†	1.0
Psychotic	3.5	22.7	†	0.000***	15.8	28.0	†	.474
"Neurotic"	4.6	2.3	†	0.701	5.3	0		
Suicide	.8	0			0	0		
Dead ^b	6.9	2.3	†	.522	5.3	0		
Absent	6.5	9.1	†	.483	10.5	8.0	†	1.0
Promiscuous	6.2	2.3	.005	.943	0	4.0		
Stepfather ^b	15.4	13.6	†	0.793	10.5	16.0	†	.684
Stepmother ^b	10.4	11.4	†	1.0	10.5	12.0	†	1.0
Institution ^c	8.5	6.8	†	1.0	5.3	8.0	†	1.0
Number of siblings	3.6 ± 2.7	3.7 ± 3.0	§	.899				

^a Chi-square test with Yates correction, *df* = 1.

^b When the subject was under 18 years old.

^c Permanent or occasional institutional care.

*, *p* < .05; **, *p* < .01; ***, *p* < .001; †, Fisher's exact test; §, Mann-Whitney *U* test.

schizophrenic, 44.0%; nonalcoholic schizophrenic, 42.1%). About one-third of the members of all groups had set fire to someone else's apartment or to a public building (33.9%, 27.3%, 24.0%, and 31.6%, respectively). An uninhabited building was set afire by 21.5 percent of the nonschizophrenics, 29.6 percent of the schizophrenics, 32.0 percent of the alcoholic schizophrenics, and 26.3 percent of the nonalcoholic schizophrenics.

No significant differences between groups were found with respect to the targets.

A total of 86.5 percent of the non-schizophrenic fire setters and 52.3 percent of the schizophrenics had been intoxicated with alcohol during fire setting. The difference was significant ($\chi^2 = 27.166$, *p* = .000). Sixty-eight percent of the alcoholic schizophrenics and 31.6 percent of the nonalcoholic schizophren-

ics had been intoxicated during the fire setting. The difference was significant ($\chi^2 = 4.373, p = .037$).

Discussion

The proportion of schizophrenic patients (14.5%) referred for a psychiatric evaluation was low in this sample compared with the samples reviewed in the introduction. Alcohol dependence was found in 77 percent of the whole sample, which is a higher proportion than in previous Finnish studies of pretrial fire setters.^{14, 38} Alcohol dependence was also observed more frequently now among schizophrenic fire setters than 20 years ago.¹⁵ The prevalence of alcohol dependence was 57 percent among schizophrenic fire setters, which is twice as high as in previous studies concerning schizophrenic patients in general.⁸⁻¹⁰ However, pretrial samples are always highly selected, and for that reason comparisons must be made cautiously.

Schizophrenic patients had not committed as many additional criminal offenses as the other fire setters, but criminal offenses committed before the psychiatric evaluation (before a hospitalization period or despite treatment) were not rare in this sample, because two-thirds of them had a criminal record. It is noteworthy in this Finnish sample of fire setters that the prevalence of violent criminal offenses was almost as common as that of crimes against property. The proportion of schizophrenic patients who committed violent offenses, multiple fire setting offenses, and property crimes was relatively high. Although no risk ratios were counted, it can be deduced conservatively that the prevalence of criminal of-

fenses among schizophrenic fire setters, especially among alcoholic schizophrenic fire setters, was higher than in the general Finnish population. From investigating their life-time criminal histories, it can be concluded that schizophrenic fire setters are dangerous not only because of fire setting but also because of their tendency toward violence. In the whole sample, fire-setting recidivism during a life-time was among the highest rates ever reported.^{1, 25, 26}

Family histories of the whole sample were characterized by being positive for alcoholism and violence, as has been described before among fire setters.^{1, 20} The frequency of the mothers' psychotic disturbance among the schizophrenic fire setters reported in this study was nearly twice as high as found by Kety *et al.*²² among schizophrenics in Denmark. In addition, it seemed obvious that only the cases of clearly ill psychotic mothers were reported by family members.

Alcoholic schizophrenic fire setters had the longest criminal records among schizophrenic fire setters, and multiple fire setting and violent offenses were typical. Their family histories were often characterized by paternal alcoholism. These findings indicate that some (about one-half in this sample) of the schizophrenic patients who commit crimes may have an impulse control disorder, similar to impulsive alcoholic murderers and fire setters,^{19, 39} which predisposes them to criminal offending.

Paternal alcoholism was observed in one-half of the sample, representing the family background described in previous studies of fire setters.^{1, 18} However, paternal alcoholism was observed most com-

monly among schizophrenic fire setters, exceeding by fivefold the estimated prevalence rates in the first-degree relatives of schizophrenics.²¹ Paternal alcoholism among schizophrenic fire setters was more common than a family history of alcohol abuse (34%) in schizophrenic patients in a recently reported sample.⁴⁰ Nearly 70 percent of the alcoholic schizophrenic fire setters had alcoholic fathers. Schizophrenic fire setters, who have been described to have more psychotic symptoms than other hospitalized criminal patients,²⁴ seem to have received an exceptionally heavy genetic loading.

Twenty years ago, it was typical of Finnish schizophrenic fire setters to burn uninhabited places.¹⁵ In this sample, schizophrenic patients had set fire to their own apartments as often as had the other fire setters. This finding may indicate that there are now outpatient schizophrenics who were previously kept in hospitals because of impulsive behavior. These trends have been reported in other Western countries.^{35, 41}

Intoxication with alcohol is more common now than 20 years ago, and it was found nearly as often among alcoholic schizophrenic patients as among non-schizophrenic fire setters previously.¹⁵ This finding indicates a tendency toward increasing alcohol abuse among schizophrenic patients.

Conclusions

Histories of paternal alcoholism and maternal psychosis characterize schizophrenic fire setters who have committed life-time fire setting and violent criminal offenses as often as nonschizophrenic fire

setters. Comorbid alcohol dependence increases the risk of life-time criminal recidivism among schizophrenic fire setters. Alcohol abuse may be increasing among Finnish schizophrenic fire setters. More accurate medication may be needed for alcoholic schizophrenic patients, who are at a great risk of violating their surroundings and themselves.^{42, 43} Alcohol dependence, which is strongly associated with fire-setting behavior and criminal recidivism among fire setters in general, calls for approaching these patients with new treatment strategies for alcoholism.

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