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Psychiatric admissions at different levels of the national health care services and male criminality: the Northern Finland 1966 Birth Cohort study

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Abstract *Background:* It has earlier been suggested that one-third of violent offenders are recorded in psychiatric case registers. Our aim was to study whether violent and non-violent offenders differ with respect to admissions to any health care inpatient service due to psychiatric disorders. *Methods:* We used a genetically homogeneous, general population database from the Northern Finland 1966 Birth Cohort, together with the Finnish Hospital Discharge Register and national crime registers. *Results:* We found that one-third of violent and one-fourth of non-violent male offenders had at least one hospital admission due to a psychiatric disorder before the age of 32. Sixty-five violent criminals – 1.2% of all cohort males ($n = 5636$) – accounted for 14.4% of all psychiatric treatment days. The admission rates among both violent and non-violent male offenders were significantly higher when compared with males with no criminal history. Among violent males, only half (55.5%) of the inpatient hospital days due to psychiatric disorders occurred in psychiatric hospitals. The corresponding percentages for

non-violent criminals and non-criminals were 64.9% and 74.1%, respectively. Among the violent offenders, one-third of hospital inpatient days occurred in university hospitals or central hospitals, and only 1.9% of them occurred in a comprehensive community care system. *Conclusions:* Violent offenders' admission rates due to a psychiatric diagnosis are high, and they are frequently treated at an inappropriate health care level.

Introduction

Violent criminality, particularly among juveniles, is an increasing problem worldwide and a subject of intense public debate. It is widely accepted that persons who suffer from major mental disorders are at increased risk of violent behaviour (Lindqvist and Allebeck 1990; Monahan 1992; Eronen et al. 1996; Tiihonen et al. 1997). Recently, at an epidemiological level, an association has been revealed between major mental disorders and registered violent crimes in large unbiased samples. In a Danish birth cohort, males with a major mental disorder had a 2.5-fold risk for all criminal offences and a 4-fold risk for violent offences (Hodgins 1992; Hodgins et al. 1996). Correspondingly, in a Finnish birth cohort the risk for violent crimes among males ranged from 5 to 7.2-fold in different mentally disordered patient groups (Tiihonen et al. 1997).

In an Australian sample, it has been estimated that one-third of all violent offenders are recorded in the psychiatric case register (Wallace et al. 1998). Offenders who had been in contact with mental health services had a high tendency to have had these contacts within the 12 months preceding a homicide (Shaw et al. 1999). Violent behaviour has been found to put an extra burden on the already costly services of inpatient hospitalization and residential services (Cuffel 1997). Rossi and colleagues (1989) reported that individuals who exhibited dangerous behaviour had increased contacts with crisis services, more frequent and longer hospitalizations, more long-term institutional placements, and increased

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contacts with criminal justice services. Further, Bigelow et al. (1988) showed that patients who, after acute psychiatric inpatient care, were hard to accommodate in less costly community-based service systems were those who had frequently displayed unacceptably aggressive and uncooperative behaviours.

To the best of our knowledge, there are no studies to date that demonstrate how the criminals use different levels of health care services in relation to psychiatric disorders. The aim of the present study was to investigate whether violent and non-violent male offenders differ with respect to admissions to any health care inpatient service due to psychiatric disorders when compared with males who have no criminal history. Towards this end we used a genetically homogeneous, general population database from the Northern Finland 1966 Birth Cohort and the National Hospital Discharge Register.

Subjects and methods

Study sample

We utilized a large Northern Finland Birth Cohort, which is an unselected, genetically homogeneous general population birth cohort database. It is based on all pregnant women ($n = 12,068$) in the two northernmost provinces of Finland who gave birth to 12,058 live-born children in 1966. The prospectively collected data consisted of 11,017 cohort members who were alive and living in Finland at the age of 16. The present study is based only on male cohort members ($n = 5636$), due to the small number of female criminal offenders in the cohort. The description of the birth cohort has been presented in detail elsewhere (Rantakallio 1969, 1988; Rantakallio et al. 1995, 1997).

Data on hospitalizations

The relevant data on lifetime psychiatric hospitalizations of the cohort members were collected from the Finnish Hospital Discharge Register (FHDR) until the end of 1997. These register data have demonstrated good accuracy in research (Keskimäki and Aro 1991). The inpatient units in the health care organization were categorized as follows:

1. Psychiatric hospitals, i.e. mental hospitals including two state mental hospitals and one prison mental hospital
2. University hospitals and central hospitals
3. Health centre wards
4. Other hospitals, i.e. regional hospitals, military hospitals, paediatric hospitals and other inpatient facilities

In Finland, diagnoses are coded according to the International Classification of Diseases (ICD-7, up to 1967; ICD-8, 1968–1986; ICD-9, 1987–1995; ICD-10 1996 onwards). Psychiatric diagnosis codes were 290–315 in the ICD-8, 290–319 in the ICD-9, and F00–F99 in the ICD-10. Psychotic disorders in this study included schizophrenia, schizoaffective disorder, paranoid psychoses, affective psychoses and other non-organic psychoses.

Data on crimes

Data on crimes by the cohort members up to the end of 1998 were collected from files maintained by the Ministry of Justice. This national register includes records of all crimes known to the police committed anywhere in Finland after a person has reached the age of 15. Violent crimes were considered to be homicide, attempted homicide, assault, robbery, arson, rape, or violation of domestic peace. All other crimes were classified as non-violent.

Statistical methods

The difference in frequency distributions of admissions with a psychiatric diagnosis (yes/no) between violent offenders, non-violent offenders and those with no crimes was studied with Pearson's chi-square test. The probability of psychiatric hospitalization among violent offenders and non-violent offenders when compared with subjects with no crimes was assessed through odds ratios (OR) and 95% confidence intervals (95% CI).

Comparisons of proportions in psychiatric treatment days were performed between study groups and separately for each inpatient unit. The statistical test used was the chi-square test with Yates correction for continuity and the nonparametric Mann–Whitney *U*-test. The statistical software used was SPSS for Windows version 8.0 (Norusis 1994).

Results

One-third of all violent male offenders had at least one hospital admission due to a psychiatric diagnosis before the age of 32, while one-fourth of the non-violent offenders had been hospitalized due to a psychiatric diagnosis. Both violent and non-violent offenders had significantly higher admission rates when compared with subjects who had no criminal history (Table 1). Sixty-five violent criminals – 1.2% of all cohort males ($n = 5636$) – accounted for 14.4% of all psychiatric treatment days and 16.3% of the treatment days due to psychoses.

Table 2 shows the number of treatment days of hospitalized male patients due to psychiatric diagnoses and psychoses in different inpatient facilities and crime

Table 1 Prevalence and risk of hospitalization due to psychiatric diagnoses among violent and non-violent criminals and patients without a criminal history in the Northern Finland 1966 Birth Cohort (males only)

	Admissions with a psychiatric diagnosis		Risk for psychiatric treatment ^a		
	Yes	No	Odds ratio	95% CI	Significance*
Violent offenders ($n = 214$)	65 (30.4%)	149 (69.6%)	7.6	5.6–10.5	$P < 0.001$
Non-violent offenders ($n = 401$)	97 (24.2%)	304 (75.8%)	5.6	4.3–7.2	$P < 0.001$
No crimes ($n = 5021$)	271 (5.4%)	4750 (94.6%)			

* Pearson χ^2 test, degrees of freedom = 1

^a Reference category: no crimes

Table 2 All hospital treatment days due to psychiatric diagnoses and separately due to psychotic disorders for the Northern Finland 1966 Birth Cohort (males only) by hospital type and by crime category

	Violent crimes (<i>n</i> = 65)		Non-violent crimes (<i>n</i> = 97)		No crimes (<i>n</i> = 271)		Comparison of proportions (χ^2 test)*	
	Days	%	Days	%	Days	%	Violent crimes	Non-violent crimes
Psychiatric disorders								
Psychiatric hospitals	5874	55.5	4047	64.9	41958	74.1	$\chi^2 = 7.85, P < 0.01$	$\chi^2 = 2.54, P = 0.12$
University or central hospitals	3036	28.7	1208	19.4	4681	8.3	$\chi^2 = 18.5, P < 0.001$	$\chi^2 = 7.75, P < 0.01$
Health centre wards	203	1.9	405	6.5	5339	9.4	$\chi^2 = 3.07, P = 0.08$	$\chi^2 = 0.44, P = 0.51$
Other hospitals	1472	13.9	578	9.3	4654	8.2	$\chi^2 = 1.40, P = 0.24$	$\chi^2 = 0.02, P = 0.90$
Total	10585	100	6238	100	56632	100		
Psychotic disorders								
Psychiatric hospitals	4721	68.3	1725	95.9	29542	87.5	$\chi^2 = 12.8, P < 0.001$	$\chi^2 = 4.59, P < 0.05$
University or central hospitals	1367	19.8	18	1.0	1148	3.4	$\chi^2 = 20.4, P < 0.001$	$\chi^2 = 0.77, P = 0.38$
Health centre wards	15	0.2	55	3.1	1790	5.3	$\chi^2 = 2.18, P = 0.15$	$\chi^2 = 0.36, P = 0.55$
Other hospitals	810	11.7	0	0.0	1286	3.8	$\chi^2 = 5.02, P < 0.05$	$\chi^2 = 2.52, P = 0.12$
Total	6913	100	1798	100	33766	100		

* χ^2 test with Yates correction for continuity, degrees of freedom = 1 (reference category: no crimes)

categories. Among violent offenders, only about half (55.5%) of the inpatient hospital days involved psychiatric hospitals, even though admission was due to psychiatric disorders. The corresponding percentages for non-violent criminals and non-criminals were 64.9% and 74.1%, respectively. Among the violent offenders, one-third of hospital inpatient days occurred in university hospitals or central hospitals and only 1.9% of them occurred in a comprehensive community care system. Furthermore, statistically significantly ($P < 0.001$) fewer treatment days due to the psychoses of the violent offenders occurred in psychiatric hospitals when compared with non-criminals.

The median number of treatment days in inpatient care due to psychiatric diagnosis amounted to 17 (interquartile range: 6–114) and 10 (interquartile range: 3–34) for violent and non-violent offenders, respectively. This difference was statistically significant (Mann–Whitney U-test: $U = 2343.50, P < 0.01$). Finally, the total number of lifetime psychiatric treatment days were analysed in quartiles. In the fourth quartile (i.e. ≥ 72 days in inpatient care), the proportion of violent offenders (32.3%, $n = 21$) was significantly higher ($\chi^2 = 12.16, df = 1, P < 0.001$) than that of non-violent offenders (9.3%, $n = 9$).

Discussion

The major findings of our study are that over 30% of violent male offenders had at least one admission due to psychiatric disorders before the age of 32, but only half of the treatment days occurred in psychiatric hospitals. Secondly, 1.2% of the total study population utilized 14.4% of all hospital treatment days due to psychiatric diagnoses and 16.3% of the treatment days due to psychoses, and these were violent criminals. However, among violent offenders, only half of the treatment days due to psychiatric diagnoses and two-thirds of the treatment days due to psychoses occurred in psychiatric hospitals.

Our major findings support those of Wallace et al. (1998), who studied a cohort of 4156 criminals in Australia and noted that almost one-third of the men convicted of a violent offence were also recorded in the psychiatric case register. Thus, our study confirms, at an epidemiological level, that there is a high risk for admissions among criminal offenders due to psychiatric disorder by early adulthood. We also noted that this risk was higher if the criminals were convicted of violent crimes when compared with non-violent offenders. Because criminals are known to be heavy drinkers (Räsänen et al. 1998), adverse illnesses related to substance use might explain our findings. Therefore, we performed further analyses in a subgroup of patients of non-organic psychotic disorders (i.e. patients with organic mental disorders were excluded). The results still showed that violent criminals were treated more frequently in hospitals other than psychiatric ones than

non-violent criminals and non-criminals. Thus, alcohol detoxification did not explain our findings.

There are some limitations of this study. We examined only male subjects, due to the small number of female criminal offenders in the cohort. In forthcoming studies, more detailed analyses of specific psychiatric diagnoses and correlations to genetic factors or social/family background history of the studied subjects are needed.

The strengths of this study were that the data were based on a large, genetically homogeneous general population birth cohort. Furthermore, the records from psychiatric admissions as well as the criminal registers in Finland have been proved reliable (Keskimäki and Aro 1991; Tiihonen et al. 1997). What is more, in this study material, agreement between the register (FHDR) and research diagnosis of psychosis is good (Isohanni et al. 1997). Our database represents geographically about a half of Finland and it covers 96% of all births in that area during 1966. Thus, we think that our findings are generalizable to all parts of Finland.

There were relatively more violent criminal offenders who used inpatient services because of psychiatric disorders than non-violent offenders and non-criminal patients. Although violent subjects used up more days in inpatient care, they did not make much use of psychiatric hospitals, where the quality of care for them should have been the best. We speculate that the high admission rate of the violent offenders may be related to the more inappropriate treatment, i.e. insufficient medication therapy and less professional preventative procedures provided by hospitals other than the psychiatric hospitals. It may also be that general practitioners and other health care professionals in a primary health care setting from where patients are referred to different inpatient facilities do not easily recognize concomitant mental disorders behind the violent behaviour problems of a patient. Another explanation of our findings might be that some violent offenders suffer from somatic disorders serious enough to prevent them from being treated in psychiatric hospitals. These questions need to be further investigated. In any case, we must put emphasis on educating staff on how to recognize the risk of violent behaviour in patients at various levels of the health care system and how to cope with them not only in a psychiatric hospital but in any health care facility.

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