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THE RATE OF HOMICIDE BY PERSONS WITH SCHIZOPHRENIA - A SYSTEMATIC REVIEW

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Abstract:
Background: It is widely believed that the rate of homicide by the mentally ill is fixed, differs little between regions and is unrelated to the total homicide rate.
Methods: We conducted a systematic review and meta-analysis of population-based studies conducted in developed countries of homicide committed by persons diagnosed with schizophrenia.
Findings: We found that rates of homicide by people diagnosed with schizophrenia were strongly correlated with total homicide rates (R=0.868, two tailed, Pb0.001). Using meta-analysis, a pooled proportion of 6.48% of all homicide offenders had a diagnosis of schizophrenia (95% confidence intervals [CI]=5.56%–7.54%). Rates of other homicides did not contribute to the heterogeneity in the proportion of homicides committed by those with schizophrenia (slope=-0.055, P=0.662). Conclusions: Homicide rates by people with schizophrenia are associated with rates of all homicides. It is therefore likely that both types of homicide have some common etiological factors. Accordingly, measures to reduce the likelihood of a person committing homicide during a psychotic illness should not only attempt to optimize treatment, but include attention to those factors associated with an increased risk of all homicides, such as improving the social circumstances of disadvantaged patients, treating substance abuse and reducing access to weapons.
Keywords: Schizophrenia Homicide Violence Meta-analysis, Mental illness.

Introduction

Schipkowensky proposed that rates of homicide by the mentally ill are similar across countries and are unrelated to total homicide rates. Other researchers reached a similar conclusion after reviewing some of the available evidence, and proposed the existence of an ‘epidemiological law’, that “the higher the rate of homicide in a population, the lower the percentage of offenders who are found to be mentally abnormal” (1). The belief that rates of homicides by the mentally ill are fixed and are unrelated to total homicide rates has gained wide acceptance (2) and has been extended to rates of nonlethal violence by the mentally ill. The research paper did not report the criteria used to exclude some studies, lacked a statistical analysis to support its findings and was confounded by heterogeneous definitions of mental illness (3). However, no subsequent study has examined the relationship between rates of homicide by the mentally ill and all homicides, despite the implications that these findings might have for homicide prevention strategies.

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Constant rates of homicide by the mentally ill between regions and over time could be regarded as evidence that most of these homicides are due to aspects of the illness itself. This would suggest that measures to improve treatment, including the containment of some patients, would reduce this form of homicide. However, a contrary finding that the rates by the mentally ill are associated with overall homicide rates raises other possibilities, for example, that the mentally ill are particularly vulnerable to the social factors that have been shown to be associated with the incidence of other homicides, such as social disadvantage and substance abuse.

The aim of this study was to test the null hypothesis that the proportion of homicides by people with schizophrenia is not associated with the rate of other homicides.

Material and Methods

We searched Medline, Cinahl, Science Direct, PsychINFO and Embase. We used the MeSH (U.S. National Library of Medicine's controlled vocabulary) terms [Homicide AND (“Mental Illness” OR “Mental disorders” OR “Unspecified Mental Disorder” OR “Psychiatric Disorder” OR “Psychological Disorder” OR “Psychiatric Nonspecific” OR “Psychiatric Illness”)] as the major subject and sub headings. We conducted a further search using the single term [Homicide] in the MeSH headings, title and abstract of all papers indexed by PubMed. MeSH searches included a full range of terms such as “Murder” and “Manslaughter”. The reference lists of publications examined in full text were then hand-searched for other relevant studies.

Results

The 18 studies reported a total of 1086 (6.6%) of a total of 16,460 homicide offenders had a diagnosis of a schizophrenia-spectrum disorder. Rates of homicide by those with schizophrenia varied from 0.02 to 0.36 per 100,000 per annum. An apparently linear association between homicides by people with schizophrenia and those without schizophrenia was evident in a scattergram. This was confirmed by a strong statistical correlation between rates of homicide by those diagnosed with schizophrenia and the rates of all homicides when examined with linear regression (R=0.868, R2 =0.754, standard error=0.204, t=6.99, df=16, two tailed Pb0.001). A second linear regression after the exclusion of the study that reported high outlying values for both the rate of homicide by people with schizophrenia and the rate of other homicides had a similar result (R=0.765, R2 =0.585, standard error=0.028, t=4.60, df=15, two tailed Pb0.001). The proportion of homicides committed by people diagnosed with schizophrenia was statistically heterogenous (Q-value=95.7, df of Q=17, Pb0.0001, I-square=82.2). A random effects model was therefore used to calculate a pooled proportion of homicides committed by persons diagnosed with schizophrenia of 6.48% (95% CI=5.56%–

7.54%, Z-value=-32.27, P-valueb0.001). A fixed model arrived at a similar result, with the proportion of homicides committed by those with schizophrenia being 6.0% (95% CI=5.7–6.4%); Z-value=-88.072 Pb0.001). Meta-regression found that the rates of other homicides did not contribute to the heterogeneity in the proportion of homicides committed by people with schizophrenia (Table 1).

Table 1. Meta-regression of the association between the proportion of homicides by persons diagnosed with schizophrenia and rates of other homicides.

Coefficents	Point estimate	Standard error	Lower limit	Upper limit	Z-value	P-value
Slope	-0.055	0.127	-0.304	0.193	-0.438	0.6
Intercept	-2.598	0.18	-2.95	-2.245	-14.44	<0.001
Model						
	Q	df	P-value			
Model	0.191	1	0.662			
Residual	19.567	16	0.24			
Total	19.758	17	0.287			

A second meta-analysis and meta-regression was performed after the exclusion of the study [4] that reported high outlying values for both the rate of homicide by people with schizophrenia and the rate of other homicides. The remaining 17 studies were statistically heterogenous in the proportion of homicides committed by patients with schizophrenia (Q-value 93.9, df of Q=16, p = 0.0001, Isquare = 83.0). The pooled proportion of homicides committed by people with schizophrenia was 6.40%, (95% CI 0.55%–0.75%). A second meta-regression confirmed that the rate of other homicides did not contribute significantly to the heterogeneity in the proportion of homicides committed by patients with schizophrenia (point estimate of slope= -0.157, standard error of slope 0.148, 95% CI -0.449–0.133, Z=-1.06, P=0.287).

Discussion

We found that the number of homicides per capita committed by those diagnosed with schizophrenia was strongly associated with the rates of other homicides. We also found no evidence that the proportion of homicides by those with schizophrenia is lower in places with higher homicide rates. This finding is the opposite of the conclusion of [5] and challenges the widely held belief that rates of homicide and serious violence by the mentally ill are constant and are associated with the epidemiology of mental illness rather than social factors associated with the level of violence in the community [6].

There are several possible explanations for this finding. The first is that social factors associated with high total homicide rates also increase the likelihood of homicide by those who have schizophrenia. For example, a correlation has been found between substance abuse and schizophrenia [7] and with homicide during the course of schizophrenia [8], and substance use is also associated with homicide by non-mentally ill offenders [9]. Moreover, the use of a firearm in an episode of violence increases the risk of a fatality regardless of the mental state of the offender. It could also be that the factors associated with high rates of violence in the community have a disproportionate effect on those with schizophrenia, either because of an interplay between aspects of the illness and substance use or weapon availability, or because patients with schizophrenia have a disproportionate exposure to those social risk factors as a result of the disability arising from the illness.

The influence of social factors on the propensity of someone with schizophrenia committing a homicide can be understood in light of the observation that around 40% of those homicides are committed in the first episode of psychosis, prior to treatment [10]. The early phase of the illness could be a period of increased exposure to social environments in which there is increased substance use and levels of violence that would not be mitigated by the intervention of treating agencies. A second possible explanation is that factors associated with overall levels of violence are independently associated with the epidemiology of schizophrenia. It is now recognized that the incidence and prevalence of schizophrenia varies between regions [11]. Hence, the same factors associated with the incidence and prevalence of schizophrenia in a community might be additionally and independently associated with the rates of homicides by non-schizophrenic persons in the same communities. Factors found in association with serious violence and homicide, and also with an increased incidence and prevalence of schizophrenia include urban living and lower socio-economic status [12,13].

The finding that about 6% of homicide offenders in the studies included in this review had a diagnosis of schizophrenia is higher than would be expected from estimates of the overall prevalence of schizophrenia, and confirms the existence of an association between schizophrenia and homicide. However, the finding that the rates of homicide by those with schizophrenia are correlated with the rates of all homicides suggests that the homicides committed by those diagnosed with schizophrenia were not entirely due to aspects of the illness or its treatment. This has implications for management and prevention policies.

For example, co-morbidity between psychosis and drug and alcohol abuse might be particularly relevant to homicide events. Researchers found that 73% of 88 people who committed

homicides during a psychotic illness also had a diagnosis of substance abuse disorder including 67 people who abused cannabis, 23 who abused amphetamines and 20 who abused alcohol. High rates of alcohol abuse (35%, 43%, 37%) and drug abuse (51%, 18%, 51%) were also reported among homicide offenders with schizophrenia in another three studies included in this review ([14]. Other areas warranting further study include the effect of lower socio-economic status, including its effect on access to treatment, and the effect of migration, on both the likelihood of developing schizophrenia and the likelihood of receiving early treatment.

Limitations of this study include variations in the way schizophrenia might have been defined and diagnosed with resulting differences in the sensitivity of the methods used to detect cases of schizophrenia among homicide offenders. This limitation might have contributed to the between-study heterogeneity found in this review and is likely to be a cause of some error in the dependent variable. However, this type of error would reduce the likelihood of our finding of an association between rates of homicide by people diagnosed with schizophrenia and rates of other homicides.

Other limitations were that we were not able to locate many studies from the USA or from other regions with high rates of homicide. We were therefore unable to show whether the association between homicide rates was still present in regions with high homicide rates. Moreover, the included studies did not report sufficient data to enable us to determine which factors contributed to the heterogeneity in the proportion of homicide offenders diagnosed with schizophrenia, such as the proportion of patients who receive treatment, delays in treatment and details of substance abuse [15].

The risk of homicide by the mentally ill and the contribution of mental illness to the rate of homicide in regions with either high or low rates of homicide should not be overstated. The findings of this study suggest that although, the rates of homicide by those diagnosed with schizophrenia are higher than expected based on the epidemiology of schizophrenia, it correlates with the rate of homicides by those who are not mentally ill. The finding supports the conclusions of researchers who found that the major predictors of criminal recidivism were the same for mentally ill and non-mentally ill offenders, and is consistent with the US National Epidemiologic Survey on Alcohol and Related Conditions, which found that the association between future violence and mental illness was best explained by intercurrent substance use [16-19].

Conclusion

This systematic review and meta-analysis found that the rates of homicide by those diagnosed with schizophrenia are correlated with the total homicides rates. It found that the proportion of homicides by patients with schizophrenia is not associated with the total homicide rate and casts doubt on the existence of an epidemiological law to this effect. This finding suggests that measures to prevent homicide by those diagnosed with schizophrenia should include not only an attempt to provide optimal treatment, but also attention to those factors known to be associated with higher rates of all homicides, such as social deprivation, substance misuse and access to weapons. If it emerges that the factors associated with rates of homicide in a community are linked to variations in the incidence of schizophrenia, rather than rates of serious violence by those with schizophrenia, then community level primary prevention strategies would also be worthwhile.

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