Overview of Violence to Self and Others During the First Episode of Psychosis

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ABSTRACT

Background: We aimed to review the evidence for an association between the first episode of psychosis and violence and to consider the possible explanations for this association and the implications for clinicians and service providers.

Data Sources: We searched for published studies in English describing an association between violence and first-episode psychosis using the subject headings, key words, abstracts, and titles in PubMed/MEDLINE from 1970 to 2010, using the terms *first-episode schizophrenia* OR *first-episode psychosis* OR *early schizophrenia* AND *suicide* OR *self harm* OR *suicide attempt* OR *homicide* OR *violence*.

Study Selection: We identified 20 studies reporting data on violent suicide attempts, self-mutilation, minor violence, severe nonlethal interpersonal violence, or homicide in first-episode and previously treated psychosis.

Data Extraction: The number of people committing acts of violence prior to initial treatment for psychosis and after initial treatment was extracted from the relevant studies.

Results: The proportion of people found to be in the first episode of psychosis at the time of an act of violence was compared to the expected ratio of first-episode to previously treated patients. A substantial proportion of psychotic patients examined after violent suicide attempts (49%), major self-mutilation (54%), homicide (39%), and assault resulting in serious injury (38%) are in their first episode of psychosis. Moreover, a substantial proportion of first-episode patients commit an act of less serious violence or attempt suicide prior to initial treatment.

Conclusions: The findings support the need for early intervention and community-wide programs to reduce the duration of untreated psychosis.

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Deinstitutionalization and the transfer of most psychiatric care to community settings in the 1970s resulted in widespread concern about the threat posed by psychiatric patients to others[1] and themselves.[2] Many psychiatrists feared that the smaller number of hospital beds and changes in mental health laws that made "risk of harm to self or others" a central criterion for involuntary treatment created unreasonable barriers to care.[3–5] These concerns appear to have prompted an interest in the empirical evidence for harms associated with psychosis. The early studies showed that concern about homicide and criminal violence by patients discharged from psychiatric hospitals was largely unfounded.[6,7] However, the 1986 Northwick Park study of early schizophrenia found that about one-quarter of patients had threatened or attempted suicide and that about one-fifth had committed an assault or had threatened to kill another person[8,9] prior to treatment, a finding that has been replicated by later studies examining various forms of violence in the early phase of psychosis.

The aim of this article was to conduct a comprehensive review of the studies that report violence toward the self and others committed by patients during the first episode of psychosis. We considered whether the apparently elevated risk of violence in the first episode of psychosis might be explained by factors other than psychosis, why initial treatment for psychosis might reduce the incidence of subsequent violence, and what were the implications of an increased risk of violence in first-episode psychosis for clinicians and mental health policy makers.

METHOD

We searched for published studies in English describing an association between violence using the subject headings, key words, abstracts, and titles in PubMed/MEDLINE from 1970 to 2010, using the terms *first-episode schizophrenia* OR *first-episode psychosis* OR *early schizophrenia* AND *suicide* OR *self harm* OR *suicide attempt* OR *homicide* OR *violence*. The results of these searches were supplemented by the examination of the lists of references of earlier systematic reviews of homicide in schizophrenia,[10–12] violence in early psychosis,[13] self-mutilation associated with mental illness,[14,15] and suicide in early psychosis.[16–18] Articles were examined if they reported on patients in first-episode psychosis who committed an act of violence to themselves or others. Any article describing actual physical violence to the self or others in relation to the first episode of psychosis was considered. Studies of aggression that did not specify actual violence and studies of patients who were not in the first episode of psychotic illness were excluded.

Definitions of Violence and First-Episode Psychosis

We used the *Australian Concise Oxford Dictionary* definition of *violence* as "behaviour involving physical force intended to hurt, kill or damage."[19] We included self-directed violence and defined *severe violence* as that causing significant or permanent injury.[13]

First-episode psychosis was defined as the period between the onset of positive symptoms and a remission from symptoms after treatment with

antipsychotic medication or treatment with antipsychotic medication of sufficient duration to result in remission from acute symptoms in most patients. This definition is used in most studies of the duration of untreated psychosis.[20] This definition of first-episode psychosis includes patients who had never previously received treatment with antipsychotic medication, regardless of the duration of psychosis or whether the patient had previous spontaneous remissions without treatment. We included studies that used the initial psychiatric hospital admission to define the onset of treatment. We included studies of first-episode schizophrenia and related psychosis but did not exclude studies that used a broader definition of psychosis that included affective psychosis.

Clinical Points

- There appears to be a significantly increased risk of violence toward self and others in the first episode of psychosis compared to later in the illness.
- Earlier treatment of first-episode psychosis patients could reduce the rates of suicide, homicide, and nonlethal violence toward self or others.
- The high rates of violence and suicidal behavior in the first episode of psychosis suggest the need to reconsider the thresholds for involuntary treatment for first-episode patients.

RESULTS

Using our search strategy, we found 8 studies describing violence to others in clinical samples of patients with first-episode psychosis,[8,26,35,36–39,98] 3 studies describing first-episode psychosis among the survivors of violent suicide attempts,[16–18] 2 reviews of major-self mutilation in first-episode psychosis,[14,15] 2 studies reporting patients with first-episode psychosis among those convicted of serious and violent crimes,[43,44] and 5 studies that described homicides by offenders in first-episode psychosis.[46,48–51]

Suicide Attempts in Early Psychosis

Among cohorts of patients treated for first-episode psychosis, between 10% and 30% attempt suicide before presenting for treatment.[21–34] However, none of the studies we identified made a distinction between violent and nonviolent methods of attempting suicide or reported the proportion of first-episode psychosis patients who had made a violent suicide attempt.

Two related studies[16,17] of the survivors of violent suicide attempts found that about one-half of those diagnosed with a psychotic illness had never been treated with antipsychotic medication and were considered to be in their first episode of psychosis. The first study, which examined survivors of violent suicide attempts by jumping from a height of more than 3 m (median height 8 m) admitted to 8 trauma centers, found that 70 of 160 had a diagnosed psychotic illness. Of the 70 with psychosis, 31 (44%) had never received treatment with antipsychotic medication. A second study[17] examined the treatment histories of patients who survived penetrating self-inflicted stab wounds to the abdomen, thorax, or neck and found that a psychotic illness had been diagnosed in 46 of 95 cases, of whom 26 (57%) had never received treatment for psychosis. We were unable to locate any studies that attempted to estimate the rate of completed suicide prior to treatment for psychosis, which is not surprising, because in most settings the diagnosis and initial treatment for psychosis would occur at the same time. However, the survivors of violent suicide attempts included a number of very seriously injured patients with psychotic illnesses that had not been recognized until after the attempt,[16–18] which suggests that suicide prior to treatment is an underrecognized cause of mortality in psychosis.

Major Self-Mutilation in Early Psychosis

Major self-mutilation, defined as the amputation of a limb or the genitals or the removal of an eye, is a severe form of self-directed violence that is strongly associated with psychosis.[14] A study of self-inflicted eye injuries[15] published in English-language medical journals since 1960 located 89 case reports of self-enucleation in which there was a diagnosis of psychotic illness. The treatment history could be determined in 77 cases, and 35 (45%) of those patients had never received treatment with antipsychotic medication.

Another study[14] considered the treatment status among case reports of major self-mutilation, defined as the complete removal of an eye or a testicle or the amputation of the penis or a limb above the hand or foot. There were 189 case reports of this type of injury published since 1960. A diagnosis of psychotic illness, mostly schizophrenia spectrum psychosis, was reported in 143 cases, and in 101 cases the treatment status could be determined. In 55 of the 101 cases (54%), the patient had never received treatment with antipsychotic medication and could be considered to be in first-episode psychosis.[14]

A History of Any Violence in Samples of Patients With Early Psychosis

Studies of violence in early psychosis[8,26,35–39,98] have reported an incidence of violence of between 5% and 32% at the time of or shortly before initial presentation of treatment for psychosis. A meta-analysis of the results of those studies[13] found that (1) one-third of patients with first-episode psychosis commit an act of violence before treatment; (2) about 1 in 6 patients commits an act of serious violence, defined as an assault on a person causing any degree of injury, a sexual assault, or an assault with a weapon; and (3) fewer than 1 in 100 patients commits an act of severe violence, defined as violence resulting in severe or permanent injury.

Severe Violence in First-Episode Psychosis

There were relatively few cases of violence resulting in severe or permanent injury reported in the cohort studies.

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However, there is a body of research about the characteristics of psychotic patients who have been charged with serious violent offenses. Two studies from the United States[40,41] of people acquitted on the grounds of insanity report large proportions of first-episode psychosis patients. A consecutive series from New York State[40] between 1971 and 1976 found that 130 of 225 offenders (58%) had not been admitted to a psychiatric hospital prior to their arrest, of whom a large proportion had probably received no treatment and were hence in the first episode of psychosis, and in a series of 79 offenders from Los Angeles County[41] who were later allowed mandated outpatient treatment, 41 (52%) had not been admitted to a psychiatric hospital prior to their offense. These findings are consistent with a study[42] linking mental health and criminal records in Denmark, which found that three-quarters of all violent offenses committed by males with schizophrenia occurred in the years immediately before the initiation of treatment, when many of those patients would have been in the prodromal phase of illness or the first episode of psychosis.

In the state of New South Wales, Australia, a high proportion of those found to have committed serious nonlethal violent offenses did so in the first episode of psychosis. In a series of 134 people[43] charged with attempted murder, wounding, and assault causing serious injury and found not guilty on the grounds of mental illness between 1992 and 2008, 52 (39%) had never received treatment for psychosis. A second study[44] of a consecutive series of 661 people charged with serious nonlethal violent offenses found that 16 of the 74 offenders (22%) with a diagnosis of psychotic illness had never received treatment. The illnesses of the offenders in this study were considered to be less severe or less relevant to their offenses, with 7 (10%) found not guilty on the grounds of mental illness.

Homicide in First-Episode Psychosis

Our interest in serious violence in first-episode psychosis began with the observation that a high proportion of homicide offenders with psychosis in New South Wales had never been treated.[45–47] Similar results have been found in studies from Canada[48] and the United Kingdom.[49] There were no homicides reported in samples of patients with first-episode psychosis, possibly because homicide is a rare event or because those charged with homicide offenses are taken directly into custody and are therefore generally not included in studies of the incidence of psychosis.

An earlier systematic review[10] of the treatment status of homicide offenders with psychotic illness located 16 studies reporting the proportion of subjects who had received treatment prior to the offense. Meta-analysis of the 10 studies[12] conducted in defined populations found that 38.5% had never been treated with antipsychotic medication and were in their first episode of psychosis. The odds ratio for homicide prior to treatment for psychosis was estimated by meta-analysis to be 15.5 times greater (95% CI, 11.0–20.6) than the annual rate after treatment. These data suggest that first-episode psychosis carries a risk of lethal violence considerably greater than any other single risk factor identified in psychiatric populations. Using conservative estimates for the incidence and prevalence of schizophrenia, we calculated that about 1 in 600 patients with schizophrenia presents for treatment by committing a homicide, compared to an annual rate of homicide after treatment of about 1 in 9,000 patients per year.[12]

Studies of people with psychotic illness who had killed either a child or a stranger[50,51] contained higher proportions of never-treated patients than other types of homicide by offenders with psychosis. In New South Wales between 1991 and 2005, 26 people with psychotic illness killed a child, of whom 15 (58%) were in their first episode of psychosis.[50] A study[51] of people who killed a stranger during psychotic illness in New South Wales, Finland, Eastern Canada, and the Netherlands found that 27 of 42 subjects (64%) had never received treatment for psychosis.

DISCUSSION

The main finding of this review is that about one-half of the psychotic patients who commit the most severe forms of violence in association with psychosis have never been treated with antipsychotics and can be considered to be in the first episode of psychosis. This proportion suggests the presence of a greatly increased risk of serious violence in the first episode of psychosis, because reliable figures for the incidence and prevalence of schizophrenia and the duration of untreated psychosis show that, at any given time, there are many more patients with an established diagnosis of schizophrenia than there are patients in their first episode of the illness.

Recent meta-analyses[52] have reported a pooled estimate for the incidence of new cases of schizophrenia to be 21.9 per 100,000 population per year and the pooled 12-month prevalence to be 440 per 100,000 population. Hence the expected ratio of previously treated to never-treated patients in a sample of people with schizophrenia should be about 440:21.9 or 20:1. If the risks of committing an act of violence were the same before and after initial treatment, the expected ratio of treated to never-treated patients in a large and representative sample of patients would be 20:1. Hence, a ratio of patients with established schizophrenic illness to patients with first-episode psychosis of anything substantially less than 20:1 in a sample of patients who have committed some form of serious harm suggests an increased risk of that harm in first-episode psychosis compared with later in the illness. A ratio of close to 1:1, as we found in studies of homicide,[10,12] severe assaults,[43,44] violent suicide,[16,17] and major self-mutilation,[14,15] suggests a 20-fold risk of that form of violence in the first episode of psychosis compared to at any time later in the illness.

Possible Explanations for the High Proportion of First-Episode Psychosis Patients in These Samples

The simplest explanation for these findings is that there is a genuinely higher rate of violence among first-episode

psychosis patients than among those who have previously received treatment, regardless of their adherence to treatment. However, we have considered several other possible explanations. The first alternative explanation is that violence is likely to be committed by untreated psychotic patients, because both the violence and the commencement of treatment are likely to take place early in the course of psychotic illness. Despite the apparent similarity between the age at onset of psychosis and the incidence of all forms of offending,[53] this explanation is unlikely to be correct because (1) longitudinal studies of offending by people with schizophrenia suggest an ongoing risk of violence beyond the peak in offending that occurs early in the course of treatment[6,50,54,55]; (2) although the annual risk of suicide by patients with schizophrenia does decline over time, it remains elevated for many years after the initial treatment for psychosis[56–58]; and (3) a long duration of untreated psychosis appears to be associated with an increased, rather than a decreased, risk of less serious forms of violence[13] and homicide.[10]

A second explanation is that the observed association of violence with first-episode psychosis is coincidental; because younger people develop psychosis, most violence is committed by younger people, and the age at onset of psychosis closely follows the peak periods of all forms of offending.[53] However, this explanation does not fit the data, because the mean age of patients who commit acts of violence in the first episode of psychosis is not especially young. The mean age of patients described in studies of homicide,[46] nonlethal violence,[43,44] violent self-injury,[16] and major self-mutilation,[14] many of whom were diagnosed with the paranoid subtype of schizophrenia and had had long durations of untreated psychosis, was about 30 years. This is substantially older than the mean age at onset of psychosis, which is about 25 years,[59] and the peak age for violent offending, which is usually considered to be in late adolescence and around the beginning of adult life.[60,61]

A third explanation is that the duration of psychotic illness before treatment is similar to the duration of illness following the initiation of treatment, and, hence, the risk of violence does not change after a person commences treatment. However, a meta-analysis of 67 population-based studies in advanced countries has shown that the average duration of untreated psychosis is about 1 year.[62] Despite the wide variation in the duration of untreated psychosis among individuals,[62] regions, and countries,[59,63] the average duration of untreated psychosis is short compared to the total duration of psychotic illness.

A fourth explanation is that a substantial proportion of patients are incorrectly diagnosed as being in their first episode of psychosis or do not go on to develop chronic psychotic illness, which could in turn inflate the number of first-episode patients reported to be violent. This explanation also seems improbable, because (1) violent events such as major self-mutilation are almost unknown among those without psychosis[14] and, like both violent suicide attempts and homicide, are strongly associated with schizophrenia[11,16]; (2) the patterns of symptoms of psychotic illness are often linked to violence, a fact recognized in the availability of the defense of mental illness in most jurisdictions[14,43]; and (3) the diagnosis of psychosis does not necessarily depend on the person's becoming violent, requires more than the presence of nondisabling auditory hallucinations, and is usually associated with loss of social function and reliably observed empirical signs of illness.[64]

Reasons for an Increased Risk of Serious Violence in First-Episode Psychosis When Compared With the Risk After Treatment

A decline in violence between the first episode of psychosis and after treatment is probably a result of the combination of psychological, biological, and social factors contributing to the increased risk prior to treatment and protecting against violence after treatment has been initiated. Although environmental factors are important in the timing and incidence of acts of violence, it is unlikely that the reduction in violence after initial treatment is due to a major change in the environmental factors affecting most patients.

An important psychological factor is likely to be that the experience of remission from positive symptoms of psychosis, in particular delusional beliefs, has a protective effect during future psychotic episodes. Much of the reported serious violence in first-episode psychosis appeared to be committed in response to frightening delusional beliefs.[46] Patients who receive an adequate explanation of their symptoms could retain enough awareness of the reason for their experiences during future episodes to be less likely to act in response to symptoms. However, the development of insight is unlikely to be the complete explanation for the decline in serious violence after initial treatment, as the findings of studies of the relationship between insight and violence in psychosis are contradictory,[65,66] and insight often develops slowly in first-episode schizophrenia.[67]

An important social factor that could be protective against violence by previously treated patients is the awareness, by the patient and those around them, of the existence of the illness and how to obtain treatment. The duration of untreated psychosis can be very long, and studies of pathways to care have demonstrated the difficulties experienced by patients with first-episode psychosis in obtaining treatment.[68] Once patients and their families are aware of the nature of the condition and the patients are known to mental health services, the interval between relapse and the resumption of treatment is likely to be much shorter. It could also be easier, once a person's condition and the probable consequences of an exacerbation of illness are known, to obtain involuntary treatment under mental health laws. The diagnosis of a psychotic illness can also limit a person's access to firearms,[43] possibly because of measures taken by the patient's carers or because of the effects of licensing laws and background checks in some jurisdictions.

A decline in substance abuse, associated with treatment for mental illness, might also be another factor contributing to the decline in violence after treatment. Substance abuse combined with psychotic illness is strongly associated with

violent behavior in populations of treated[69,70] and never-treated patients.[36,37,39] Ongoing substance abuse after initial treatment is associated with more severe symptoms and increased rates of relapse,[71] which might in turn be associated with violence. However, there appears to be a general decline in the proportion of patients who use substances after the first episode of psychosis, either as part of the natural history of the disorder or as a consequence of ordinary clinical care, and a number of good-quality prospective studies of first-episode psychosis patients have demonstrated substantial declines in the use of both cannabis and alcohol after diagnosis.[72–76] These prospective studies are consistent with the findings of a recent meta-analysis of cross-sectional studies of cannabis use in psychosis, which found higher rates of cannabis use in first-episode samples when compared to samples of treated patients.[77]

Adherence to treatment might also result in a reduction in the incidence of violence during those periods in which the patient is taking the medication.[78] However, it has been estimated that as few as 50% of patients take antipsychotic medication in a reliable way.[79,80] In a study specifically examining severe nonlethal violence, as few as 12% of patients with a previously treated psychotic illness were adherent to treatment at the time of committing a violent offense.[44]

Biological changes associated with the first episode of illness might contribute to the observed decline in violence after recovery from the initial episode. One model attempting to explain the association between violence and psychosis suggests that an inherent susceptibility to irritability and impulsive behavior is coupled with disorganization and impairment of reality testing.[81–83] In this model, bottom-up "drivers" of aggression are regulated by the application of top-down "brakes" that suppress emotional responses and behaviors with negative consequences. Emerging psychosis is characterized by diminished frontal inhibition, which is in keeping with findings of frontal lobe dysfunction in established schizophrenia, and striatal hyperactivity in emerging psychosis, involving the amygdala and limbic system, is thought to act as a driver of aggression. It has been suggested that atypical antipsychotics counter these actions by reducing subcortical dopaminergic stimulation and enhancing frontal inhibition,[84] which could also explain why ongoing adherence to medication causes a decline in violent behavior.

A further possibility is that treatment with any antipsychotic medication has an enduring neurobiological effect that could itself reduce the likelihood of subsequent serious violence. Older forms of potent antipsychotic medication were found to induce lasting behavioral changes in animals,[85] and there is a growing body of research showing changes in brain morphology following treatment with antipsychotic medication.[86–89] Hence, it is possible that some of the observed decline in serious violence after initial treatment is mediated by brain changes and by enduring changes in symptom patterns and cognitive function caused by the antipsychotic medication itself.

Declining rates of violence after initial treatment might also reflect the natural history of schizophrenia. There are likely to be some patients who present for treatment for the first time because of an episode of violence who would not otherwise have presented until later in the illness or not at all. However, a survivor effect such as this is unlikely to explain the decline in the most serious forms of interpersonal violence, such as homicide, because homicide is rare, and only a small proportion of patients are removed from the possibility of further acts of violence because of imprisonment or placement in a secure hospital. The emergence of negative symptoms of schizophrenia could reduce the risk of violence over time for some patients,[90] but the existing evidence suggests that untreated patients become more prone to violence the longer they remain untreated.[10,13]

Implications for Treatment of Early Psychosis

Some treatment guidelines have recommended that patients thought to be in their first episode of psychosis should have a period of observation without antipsychotic medication.[91] However, the results of this review suggest that treatment has an important role in reducing harm in early psychosis and that any decision to delay treatment beyond that needed to be sure of the diagnosis could expose the patient and others to avoidable risks. Even in specialist services, the proportion of patients with psychosis who are admitted to hospital shortly after contact with mental health services has been reported to be as high as 80%,[92,93] and further observation without treatment is therefore unlikely to result in many patients being spared treatment with antipsychotic medication.

It is probably also important to ensure an adequate duration of treatment of the first episode of psychosis, to maximize both the chance of remission from symptoms and the development of awareness of illness. There is some evidence that mandated treatment of longer duration does reduce readmission rates after a violent offense,[94] and the same might be true for first-episode patients who are at risk of further violence. Treatment of an adequate duration, whether in hospital or in a community setting, should assist patients and their families to develop a more complete understanding of the nature of the illness, recognize signs of relapse, and learn how to arrange treatment.

Treatment of first-episode psychosis is increasingly conducted by specialized services. However, reducing the duration of untreated psychosis requires the support of community education campaigns and the involvement of nonmedical services to identify cases. Existing services are notoriously poor at identifying emerging psychosis and arranging early treatment, which is confirmed by the surprisingly long duration of untreated psychosis in many advanced countries.[62]

The increased rate of harm during early psychosis compared with later in the illness suggests that a lack of engagement in treatment might be the main risk factor for serious violence in first-episode psychosis patients. No studies have directly compared the extent of the risk of never being treated to known risk factors such as young age and male sex, and the risk factors for violence in first-episode

psychosis patients have not been established.[13] Hence, any risk assessment instrument derived from studies of treated patients might not apply to the assessment of first-episode psychosis patients. In any case, the demonstrated reduction in the rates of serious harm after adequate treatment suggests that lack of treatment is itself a major risk factor for serious violence in psychosis. The decline in rates of serious harm after treatment should allow us to reassure families and members of the public that they have little to fear from patients who are receiving adequate treatment.

Implications for Mental Health Services and Mental Health Law

Studies of pathways to care cite a number of barriers to care for young people with emerging psychosis, including the lack of recognition of early psychosis in mental health services, the inflexibility of assessment procedures, and the lack of appropriate services for young people. Reducing the delay in treatment requires a community-wide approach to locating and engaging patients with early psychosis, directly involving families, school counselors, services for homeless young people, and juvenile justice agencies. The engagement of juvenile justice agencies is of particular relevance, because of the high rate of assault by young people with emerging psychotic illness and the parallels between the incidence of some offenses and the incidence of major psychiatric disorder. Services for younger people need to be re-engineered to provide accessible care in a range of settings.[95,96]

In many jurisdictions, mental health laws can present a barrier to care, in part because of the well-meaning attempts to balance the patient's rights with their need for treatment. The duration of untreated psychosis in jurisdictions with mental health laws that require that a person be assessed as at risk to themselves or dangerous to others before they can receive treatment has been found to be an average of 5 months longer than in jurisdictions with other forms of mental health law.[63] Hence, there is an argument for changes to mental health laws to allow earlier treatment of first-episode patients who lack decision-making capacity and who refuse treatment.[97] Even if mental health laws requiring the prediction of some form of harm are retained, the evidence presented in this review demonstrates that emerging psychosis carries a substantial risk of harm to self or others and suggests the need for a period of involuntary treatment in treatment-refusing patients in order to control symptoms, help the development of insight, and engage these patients in ongoing treatment.

CONCLUSIONS

The emerging evidence of an increased risk of violence and serious harm during the first episode of psychotic illness supports the need for early treatment to improve the outcome of schizophrenia. The findings presented in this article suggest that an important consequence of effective early psychosis services is likely to be a substantial reduction in the level of serious violence to patients and those around them. Further research into the reasons for the apparent decline in rates of serious violence after treatment would not only assist the development of strategies to reduce serious harm but could also improve our understanding of the neurobiology and psychopathology of psychotic illness.

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