

Suicidal Behavior in Adolescents with First-Episode Psychosis

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Abstract

Background: Studies have reported an increased risk for suicide in adults with schizophrenia, but limited data on younger populations are available. **Aims:** We hypothesize that first-episode psychosis is associated with an increased risk of suicidal behavior in adolescents. **Method:** A retrospective study was conducted with patients (n=102) diagnosed with psychosis not otherwise specified (NOS), schizophreniform disorder, schizoaffective disorder or schizophrenia within six months prior to admission. A control group consisting of ninety-eight patients with other (nonpsychosis) psychiatric diagnoses admitted to the same unit was matched by age, gender and ethnicity. All patients and controls were administered the Brief Psychiatric Rating Scale-Children version to assess severity of psychiatric symptoms and suicidality, and medical records were used to assess suicidal behavior and possible risk factors. **Results:** When compared to controls, patients with psychosis had over twice as many suicide attempts overall ($p < 0.01$). The 32% incidence of suicide attempts reported in this cohort is nearly double what is reported in adults with psychosis. Depressive symptoms were significantly correlated with increased suicide attempts ($p < 0.05$). **Conclusions:** There was no significant difference between the number of pediatric psychosis inpatients versus nonpsychotic psychiatric inpatients who attempted suicide. There was, however, a significant difference between the total number of attempts between groups, illustrating that children and adolescents with psychosis are more likely than nonpsychotic psychiatric inpatients to have repeat, or multiple, suicide attempts. Longer duration of untreated psychosis, ADHD and depressive symptoms were found to be the strongest risk factors for patients with psychosis.

Key Words: Adolescents, First-Episode Psychosis, Suicidality, Suicidal Behavior

Introduction

A large proportion of the increased mortality associated with schizophrenia can be accounted for by suicide (1). Adolescents with an earlier onset of psychosis have the highest risk, and for patients with schizophrenia, the strongest predictor is a previous suicide attempt, increasing the risk by forty times (2). An adolescent with psychotic symptoms and a history of suicide attempts has a higher risk of committing suicide in the next five years than an adolescent without psychosis, but who has attempted suicide in the past (3, 4).

Estimates of the rate of suicide in adolescents with psychosis are varied. In the widely referenced review by Miles et al., the lifetime risk of suicide was found to be 10% (5, 6). Another review by Caldwell and Gottesman in 1990

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Submitted: January 7, 2009; Revised: June 12, 2009;

Accepted: June 15, 2009

Clinical Implications

We believe the risk of suicidal behavior to be higher in adolescents with first-episode psychosis, and our findings seem to support this hypothesis. They emphasize the need for early diagnosis and treatment of psychotic symptoms, which would likely help to prevent and reduce the suicide-related mortality in patients with first-episode psychosis. Clinicians should take this into consideration when doing a risk assessment for hospitalization and in the provision of follow-up care (2, 3, 7, 12, 21, 24, 31, 33, 35). In addition, healthcare providers should be watchful for depressive symptoms and impulsivity, and patients presented with these symptoms should be closely monitored.

examined two studies by Bleuler and Tsuang et al., where the risk was estimated at 12.8% and 10.1%, respectively (1, 7-9). Another meta-analysis done by Palmer et al. in 2005, estimated the risk of committing suicide to be about 5.6% in first-episode psychosis patients (10). This difference can be explained by Palmer's inclusion into his calculations of the probability that a patient would die by suicide during the course of the study, what he referred to as "proportionate mortality" (number of suicide attempts divided by number of deaths in the study). Regardless of age, the early phase of schizophrenia is thought to be a uniquely high-risk period for suicidal behavior. Researchers in the United Kingdom (U.K.) indicated that self-harm is common in the period between the onset of psychotic symptoms and first contact with psychiatric services. In fact, rates of suicide differ between first-episode and chronic schizophrenia groups, with first admissions having rates three times higher (10). Harkavy-Friedman et al. indicated that 20 to 40% of adolescent schizophrenic patients attempt suicide, especially in the first ten years of the illness (11). Between 15 to 26% of patients with schizophrenia (both adults and adolescents) have made one suicide attempt by their first admission to a hospital and 2 to 11% will go on to make another attempt during their first year of treatment. Suicidal behavior may even be the immediate precipitant for the hospitalization (12, 13).

There have been several risk factors for suicide in patients with schizophrenia emphasized in the literature. However, studies examining these risk factors have revealed varied results. Although research suggests that males are more likely to be successful in their suicide attempts than females, the two groups do not differ significantly in the rate of suicide attempts (3, 4, 14, 15). Other risk factors for suicide in schizophrenia include recent diagnosis of the illness (within the last five years), Caucasian ethnicity and a family or personal history of suicide attempts (13, 16-19). Not surprisingly, comorbid severe depression consistently shows increased risk of death by suicide (13, 15, 17). Another frequent comorbidity is substance abuse. Mueser et al. reported that in adult patients with schizophrenia who attempted suicide, the lifetime risk of alcohol abuse ranged from 12.3 to 50%, cannabis abuse from 12.5 to 35.8%, 11.3 to 31% for stimulants, 5.7 to 15.2% for hallucinogens and 2 to 9% for sedatives (20-22).

Despair and a high level of insight have been linked to suicidal behavior in adult psychotic inpatients (23, 24). In addition, Nangle et al. noted that those who attempted suicide outperformed those who did not in executive functioning and verbal fluency (25). In several studies on patients admitted to the hospital for psychosis (both adolescent and adult), those who had insight into their illness were at a higher risk for suicidal attempts (26-29). Studies of adult patients with schizophrenia have inadequately emphasized the devastating impact of this stigmatized diagnostic label. The data are even more limited in the adolescent population. In a Swedish study conducted on eighty-eight adolescents admitted to an inpatient unit, a ten-year follow-up found that 4.5% had committed suicide and 25% had attempted suicide (2). Kim et al. indicated that hopelessness was the most significant predictor of suicidality in adults with schizophrenia (30). Despite the gravity of these findings, research in suicidality and psychosis has not been pursued further in child and adolescent populations. Our aim was to study first-episode psychosis in children and adolescents and its relationship to suicidality. We hypothesize that in this younger population, those with psychosis will have significantly higher rates of attempted suicide when compared with psychiatric inpatients without psychosis.

Methods

A retrospective chart review identified 1,500 patients admitted to the Child and Adolescent In-Patient Psychiatry Unit at the Cleveland Clinic from 2003 to 2006. An Institutional Review Board (IRB)-approved database was established to collect variables from electronic medical charts, allowing for statistical analysis. Several variables were analyzed, including demographic data, psychotic symptoms, medication, history of substance use, violence, physical/sexual abuse, and criminal charges.

Inclusion criteria consisted of admittance to the inpatient unit, age of 12-18 years, and psychosis diagnosed by consensus of two board-certified child and adolescent psychiatrists using the *DSM-IV TR* criteria for first-episode psychosis: psychosis not otherwise specified (NOS), schizophreniform disorder, schizoaffective disorder and schizophrenia. All psychotic patients had at least one of the following symptoms described in their medical records: hallucinations, delusions or peculiar fantasies (fantasies that

interfere with the perception of reality). Patient exclusion criteria included: age under 12 and over 18 years, psychosis secondary to a known medical condition, substance-induced psychosis, history of substance abuse, moderate to severe mental retardation (IQ less than 70), autism and other chronic neurological disorders, schizophrenia diagnosed more than one year prior to admission, patients on lithium or those diagnosed with bipolar disorder.

Of the charts reviewed, 102 patients were admitted for new-onset psychosis. A control group of 98 patients admitted to the same unit for nonpsychotic reasons was established and matched by age, gender and ethnicity. Their diagnoses included behavioral or mood disorders (ADHD, ODD, MDD or bipolar disorder). To assess the severity of symptoms, the Brief Psychiatric Rating Scale-Children version was used (BPRS-C anchored version). The BPRS-C is a one-page form consisting of twenty-one items rated on a seven-point severity scale (not present, very mild, mild, moderate, moderately severe, severe, and extremely severe). This scale is one of the most widely used psychiatric rating scales (4) and is a well-validated outcome measure in research, developed to assess the severity of symptoms in a variety of psychiatric disorders (5). This scale has an excellent internal consistency (Cronbach's $\alpha=0.083$) (3), and has been described by many authors as a reliable and valid method to assess the emotional functioning of children up to 18 years of age (1). Admission scores of the BPRS-C were calculated for each patient with new-onset psychosis, as well as for each of the matched controls. Suicidality was assessed using the following anchored question for the BPRS-C: 1—no suicidality is present, 2—very mild (thoughts when angry), 3—mild (occasional thoughts), 4—moderate (thoughts present in the last week), 5—moderately severe (recurrent thoughts present almost daily), 6—severe (current suicidal plan), 7—extremely severe (patient attempted suicide within the last month). Although the BPRS-C provides useful diagnostic information, it is not designed to be a diagnostic instrument. For this reason, each patient was diagnosed by the consensus of two child and adolescent psychiatrists according to the *DSM-IV TR* criteria (for the control and the patient group).

The main goal of this study was to evaluate suicidal behavior in psychotic adolescents admitted to a child and adolescent inpatient psychiatric unit. The secondary aim of this study was to determine any relationships between suicidal behavior and other variables, and thus to gain preliminary insight into the suicidal tendencies of the population. During each patient admission, a psychiatric interview was completed by two board-certified child and adolescent psychiatrists to attain a psychiatric diagnosis and assess the severity of symptoms. Information was recorded from a separate interview with the parents or legal guardians to confirm facts

reported by the patient and to obtain a family history of suicide and attempted suicide. To assess suicidal behavior and possible risk factors, patient medical records were reviewed, including medical and psychiatric history, psychosocial assessments, all notes from hospitalizations, and past family psychiatric history. In order to be classified as a suicide attempt, the patient had to be admitted to the hospital secondary to self-harm with clear evidence of bodily harm.

Statistical Analysis

The relationships between patient groups (first-episode psychosis vs. control group) and the variables in the admission data were examined using either a chi-square or Fisher's exact test for nominal categorical variables, or Wilcoxon-Mann-Whitney or Kruskal-Wallis tests for ordinal or interval variables. In the interest of identifying any possible association/correlation between the variables, no corrections for multiple comparisons were performed. After using univariate methods to identify possible significant associations, subsets of those variables exhibiting significant univariate association, and whose associations were believed to be clinically meaningful, were tested for significance by regressing them against the dichotomous variable "suicide attempts" using the methods of multivariate logistic regression.

Results

A summary of the socioeconomic characteristics of both groups can be found in Table 1. Of the 102 participants, 28 were diagnosed during the admission with psychosis NOS, 24 with schizophreniform disorder, 25 with schizoaffective disorder and 25 with schizophrenia. From the total group, 32% had a reported suicide attempt.

Table 1 Demographic Summary of Patients

| Gender | | | | | |
|-------------------------|-----------|------------------|--------|-------|-----|
| | Male | | Female | | |
| Psychotic | 67 | | 35 | | |
| Controls | 61 | | 37 | | |
| Ethnicity | | | | | |
| | Caucasian | African American | | Other | |
| Psychotic | 48 | 46 | | 8 | |
| Controls | 39 | 53 | | 6 | |
| Age | | | | | |
| | n | Mean | Std | Min | Max |
| Psychotic | 102 | 14.78 | 1.9 | 12 | 18 |
| Controls | 98 | 14.9 | 1.8 | 12 | 18 |
| Std= standard deviation | | | | | |

Table 2 Significant Association between Suicide Attempts and History of Previous Psychiatric Illness and Suicide Attempts and History of Self-Injury in the Psychotic Population

| | | Suicide Attempt in Patients with Psychosis | | | | | p-Value Chi-Square (1 degree of freedom) |
|--------------------------------------|-----|--|---------|---------------------|--------|--------------------|---|
| | | Total | Yes (n) | Yes (% of Total) | No (n) | No (% of Total) | |
| History of Psychiatric Illness | No | 28 | 2 | 7.1 | 26 | 92.9 | <0.001* |
| | Yes | 72 | 30 | 41.7 | 42 | 58.3 | |
| History of Self-Injury | No | 56 | 5 | 8.9 | 51 | 91.1 | <0.001* |
| | Yes | 39 | 26 | 66.7 | 13 | 33.3 | |

*Because of the retrospective nature of the study, patients who failed to answer these two questions were excluded from this table.

The most frequent suicide methods were drug overdose 60% (n=20), cutting 35% (n=11) and others 5% (n=2, hanging and jumping in front of a car). Each suicidal attempt was judged as such by the intention behind the act (as opposed to an accident or destructive self-harm without goal of suicide). Female patients were found to be just as likely to attempt suicide as male patients, but male patients were found to carry out more severe (violent) suicide attempts on average, requiring a higher level of care (e.g., intensive care unit).

Comparing a group of 102 children and adolescents with psychosis with 98 controls, those with psychosis had a total of 104 suicide attempts and the control group had 51 attempts. This is an average of one suicidal attempt per psychosis patient. For controls, the average is one suicidal attempt per two patients. The difference in the ratios is significant ($p<.05$), and the sample of 200 patients provides a power of .99.

Thirty-two patients had a total of 104 suicide attempts in the new-onset psychosis patient group. Twenty-eight patients had attempted suicide in the control group with a total of 51 suicide attempts. When comparing the two cohorts, psychotic patients had over twice as many suicide attempts overall ($p<0.01$) compared to controls. At first glance, this data supports the findings of adult studies that show increased suicidal behavior in patients with psychosis. However, this group of adolescents seems to display a different pattern of suicidal behavior, since between groups the number of patients attempting suicide was similar, but the frequency of repeat attempts was higher.

In our psychosis cohort, patients in the higher age range had an increased rate of attempted suicide. Between those that attempted suicide and those that did not, there

was a significant age difference, the former with a tendency to be older ($p<0.05$). Of those that did not attempt suicide, the mean age was 13.3, while the mean age of those that attempted suicide was 14.6. In addition, patients with a past psychiatric history (previous diagnosis), in addition to their current symptoms of psychosis, were more likely to have attempted suicide ($p<0.001$) (see Table 2) than patients without a past psychiatric history, as were patients with a history of self-injury ($p<0.001$). However, the higher scores on the BPRS-C did not correlate with an increase in self-harming behavior. Most patients who attempted suicide were in the moderate range of the BPRS-C score. A family history of suicide attempts was present in sixteen of the patients with new-onset psychosis. Half of these patients attempted suicide themselves. A family history of completed suicide in a first-degree relative was identified in eleven of the patients; six of these eleven patients had attempted suicide. This suggests that a family history of suicide is an important risk factor to take into account when assessing patients with psychosis.

In the multivariate analysis for the dichotomous variable "suicide attempts," depressed mood as a symptom, not as a diagnosis, was associated with self-harm in the psychotic group (see Table 3). These patients were 2.8 times more likely to attempt suicide. Over 80% of psychotic patients had one or more co-occurring psychiatric disorders at admission, with ADHD being most prevalent (n=49), followed by depression (as a diagnosis) (n=36).

Psychotic patients were more likely to have more than six months of untreated symptoms or reported noncompliance with prescribed medications than the control psychiatric population. The duration of untreated psychosis (DUP) of our sample demonstrated an interesting pattern, with

Table 3 Factors Correlated with Increasing Odds of Attempted Suicide

| Effect | Point Estimate | 95% Wald Confidence Limit | | p-Value |
|---------------------|----------------|---------------------------|-------|---------|
| | | Yes | No | |
| Depressive Symptoms | 2.899 | 1.023 | 8.213 | 0.045* |
| Negative Symptoms | 1.146 | 0.418 | 3.140 | 0.790 |
| Smoking | 2.043 | 0.539 | 7.749 | 0.293 |
| Alcohol | 1.367 | 0.336 | 5.553 | 0.662 |

*After multivariate analysis, depression as a symptom had a significant correlation with the odds of increased attempt of suicide.

patients experiencing six months or more of untreated psychosis having the highest ratings of suicidality (see Figure 1).

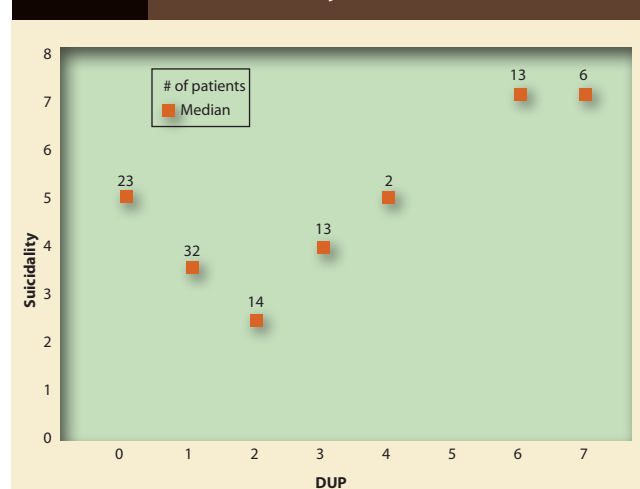
Discussion

This study has demonstrated that a high percentage of children and adolescents with psychosis attempt suicide (31%), but this is not significantly different from the percentage of children and adolescents with other nonpsychotic psychiatric diagnoses that attempted suicide (28%). However, our psychotic cohort had twice as many suicide attempts overall as our nonpsychotic cohort, illustrating that psychosis inpatients are more likely to have repeat or multiple suicide attempts. Depressive symptoms were one of the most frequent comorbidities in the group of patients who attempted suicide in the psychotic group. It is important to recognize depressive symptoms and address them early enough in patients with psychosis to decrease the likelihood of suicidal attempts. We also found that patients with a longer duration of untreated first-episode psychosis had an increased number of violent suicide attempts, some of them requiring intensive care. One might assume that this finding could be related to increased severity of positive symptoms (e.g., command hallucinations). Contrarily, we found that patients with a higher rate of suicide attempts were not in the highest range of the BPRS scores, which emphasizes a relationship between the patient's awareness of his or her illness and suicidal behavior. The ratios of major psychiatric comorbidities were fairly similar among the psychotic patients and the control group.

Jarbin and Von Knorring reported females having attempted suicide more often, but that males were more likely to successfully complete a suicide due to the use of more lethal methods (2). Harvey and colleagues reported that males of higher socioeconomic levels were more likely to harm themselves during their first episode of psychosis (2, 31, 32). Although female and male attempts in our sample

were similar in overall number, females were more likely to be repeat attempters and to use less harmful methods, consistent with prior reports (33, 34). History of psychiatric comorbidities or history of self-injury was associated with a significant increase in suicide attempts in our sample, which supports Shoval and colleagues' findings of historical self-harm behavior in schizophrenic adolescents who were suicidal (35, 36). They also reported the abuse of alcohol and specific drugs (inhalants, LSD, MDMA) to impact suicidality but we were unable to support this due to inadequate numbers of reported substance users in our sample (and our exclusion of substance abusers). ADHD and Major Depression were the most frequent comorbidities in our patients. Authors note the close association of depression with suicidal behavior in young psychotic patients and predict nearly a threefold increase (2). Our patients frequently carried an historical diagnosis for depression prior to the admission for psychosis, which may account for the higher rate of suicidal behavior. However, ADHD—associated with impulsive decision making and risk taking—may also increase suicidal risk and should also be followed carefully after discharge.

The literature supports our findings that family history of suicide attempts and completions is much higher for patients with psychosis than in the general population (2, 12, 14). Not only does this raise a flag of concern for the children, but also for their parents and siblings who may suffer from symptoms of depression. Contrary to our findings, Jarbin and Von Knorring reported a 10% suicidality rate before admission for the first psychotic break and a threefold increase in this rate after 10–15 years (2, 15). However, the majority of studies showed that it is more likely to have

Figure 1 Suicidality and Duration of Untreated Psychosis (DUP)

To assess suicidality, the BPRS suicidality score from 1–7 was used (1 low–7 most severe). Duration of untreated psychosis was measured in months. Patients with longer durations of untreated psychosis presented severe suicide attempts, with the red square representing the median.

increased suicide attempts early on in the illness (3, 27-29). Studies by Schwartz et al. and Crumlish et al. support the concept that depression and insight into mental illness after the initial psychotic break increases the risk for suicide (3, 26).

Contrary to Harvey's adult study in the U.K., our study indicates age does have an impact on the risk of self-harm in adolescents with psychosis, with older adolescents at a higher risk (31). Harvey et al. also believe that most patients with schizophrenia commit suicide during the first five years of their illness. They also report that duration of untreated psychosis (DUP) has been an independent predictor of self-harm, regardless of age of illness onset (31). In our study, patients with a longer DUP had a higher suicidality score. However, this is not to say that a longer DUP predicts more severe symptoms; in fact, studies have shown that increasingly severe psychotic symptoms might theoretically protect against insight by allowing escape from reality and the associated suffering of mental illness (26). However, it is still painful for the individual and their family; thus, efficacious treatment early on is still clearly advantageous, and two early intervention psychosis programs reported decreased suicide attempts at the one-year mark (12, 37). In this study, a consecutively admitted series of adolescents (ages 12-18) with first-episode psychosis was studied to identify demographic and clinical variables associated with suicidal behavior in this population. Suicide attempts were more prevalent in late adolescents, socially isolated individuals, and in patients with a diagnosis of schizoaffective disorder or major depressive disorder (diagnosed in previous last six months). Duration of untreated psychosis was longer in the group with more severe suicide attempts. Patients with depressive symptoms were three times more likely to have a suicide attempt, and ADHD was the most frequent comorbidity in our sample.

Conclusions

We believe the risk of suicidal behavior to be higher in adolescents with first-episode psychosis, and our findings seem to support this hypothesis. They emphasize the need for early diagnosis and treatment of psychotic symptoms, which would likely help to prevent and reduce the suicide-related mortality in patients with first-episode psychosis. Clinicians should take this into consideration when doing a risk assessment for hospitalization and in the provision of follow-up care (2, 3, 7, 12, 21, 24, 31, 33, 35). In addition, healthcare providers should be watchful for depressive symptoms and impulsivity, and patients presented with these symptoms should be closely monitored.

Limitations

The results of this study should be interpreted in light of the following limitations: this was a retrospective review

of all cases of psychosis admitted to an inpatient child psychiatric unit. We acknowledge that this is a limited research strategy, as we were restricted to surviving psychiatric inpatients and, thus, unable to include those who successfully committed suicide or even a general outpatient psychiatric population. Although we were able to report on some of the most widely studied variables, some other variables were excluded; for example, patients who were substance abusers were excluded in order to narrow the population that we intended to study. We relied on clinical observation by consensus of two child and adolescent psychiatrists, according to the *DSM-IV TR*. Replication of our findings is needed with a prospective study that includes a structured diagnostic interview.

Author Disclosures

Authors have no conflicts of interest to disclose.

Acknowledgments

The authors thank Neal Ryan, MD for his helpful comments, critiques and advice.

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