



The Prevalence of Suicide Attempts and Independent Demographic and Clinical Correlates among Chronic Schizophrenia Patients in Agricultural Areas of China

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Abstract

This study investigated the lifetime prevalence of suicide attempts (SA) and independent demographic and clinical correlates in stabilized schizophrenia inpatients. A cross-sectional study was conducted in three psychiatric hospitals in Anhui province, an agricultural province located in east China. Psychopathology and depressive symptoms were assessed using the Positive and Negative Syndrome Scale (PANSS) and Hamilton Depression Rating Scale (HAM-D), respectively. A total of 315 stable schizophrenia inpatients were interviewed prior to discharge. The lifetime prevalence of SA was 22.2%. Multiple logistic regression analysis revealed that female gender ($P < 0.001$, OR = 3.4, 95%CI: 1.9–6.0), being married ($P = 0.02$, OR = 2.2, 95%CI: 1.1–4.4) and having more severe depressive symptoms ($P = 0.014$, OR = 1.2, 95%CI: 1.01–1.3) were independently and significantly associated with higher risk of SA. Lifetime SA is common among hospitalized schizophrenia patients living in agricultural areas of China. For suicide prevention, regular assessments, appropriate interventions and clinical management should be integrated into a community-based psychiatric service model for this population.

Keywords Schizophrenia · Suicide · Risk factors · China

Introduction

Schizophrenia is a severe psychiatric disorder, with a high risk of suicidality [1, 2] and an approximate 10–20 years expected reduction in life expectancy [3–5]. Up to 40% [6] of

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premature mortality in schizophrenia could be attributed to suicide and other unnatural deaths. A meta-analysis found a suicide rate of 4.9% in people with schizophrenia [1]. A recent meta-analysis [7] reported that some factors contributing to suicidality in schizophrenia include male gender, being white, younger age, shorter illness length, poor adherence to treatment, high premorbid IQ, depressive symptoms, substance abuse and having a previous suicide attempt.

Suicidality is a multistage continuum that ranges from suicidal ideation (SI), as a key initial step, suicide attempts (SA), to final suicide [8]. SI refers to thoughts or wishes to die, and SA is defined as a self-destructive act that occurred at least once but did not result in death [9]. SI is a precursor of SA, and SA is a major predictor of later suicide; therefore, examining the pattern and correlates of SA is important in suicide prevention [10–13]. To date, most studies on SA in schizophrenia have been conducted in Western countries. With a different sociocultural and economic context, the risk factors for SA in Asian countries may be different and it is therefore important to conduct epidemiological studies of SA in different settings [14].

In China approximately 7.16 million people suffer from schizophrenia [15, 16] and SA is common in this population, with a range of prevalence estimates across studies [17–22]. For example, Zhang et al. [20] found the SA rate was 9.2% among hospitalized schizophrenia patients in Beijing. Another study [23] reported a 19.8% SA prevalence among schizophrenia inpatients in Sichuan province. A meta-analysis found that the pooled lifetime prevalence of SI and SA were 25.8% and 14.6% respectively in Chinese patients with schizophrenia [24]. However, most of these studies were conducted in big cities or economically developed areas, with scant data for agricultural areas.

Unlike in most developed countries, in China the de-hospitalization campaign never occurred. Hospital-based care has been and remains to be the mainstream mental health service. In order to help patients with severe mental illness re-enter the community, community-based mental care has started gaining attention. One important step was the initiation of a national community-based psychiatric service delivery model (the “686” project) in 2004. This service has integrated the resources of psychiatric hospitals and existing community health systems and provided individual service plans [25]. Approximately 4 million patients with schizophrenia have been registered in 31 provinces, municipalities and autonomous regions and of them, 88.7% received regular services by 2015 [26]. The current community-based psychiatric service model mainly focuses on the prevention of aggressive behaviours. However, the pattern and risk factors for suicidality, particularly SA, are not clear, although these are important in suicide prevention.

In this research project, we set out to examine the prevalence of SA and its demographic and clinical correlates in stabilized schizophrenia inpatients.

Methods

Patients and Study Sites

This was a multi-center, cross-sectional study conducted in three psychiatric hospitals between May and December, 2018 in Anhui province, an agricultural province located in east China with around 70.6 million population. Hospitalized patients in the participating hospitals were consecutively recruited prior to discharge if the following inclusion criteria were met: 1) aged 18 years or above; 2) a diagnosis of schizophrenia according to the ICD-10 [27] for at least 5 years; 3) clinically stable for at least one month; 4) able to provide informed consent and

complete the assessment. Patients with major medical conditions were usually not admitted to psychiatric hospitals or departments, therefore any such patients were excluded from this study. The study protocol was approved in the Ethics Committee of Chaohu Hospital of Anhui Medical University. All patients provided written informed consent.

Data Collection

Basic demographic and clinical data were collected by a review of the medical records. The Positive and Negative Syndrome Scale (PANSS) [28] was used to measure psychotic symptoms, including “positive” (items P1, P3, P5, G9), “negative” (items N1, N2, N3, N4, N6 and G7), “cognitive” (items P2, N5, G11), “depression” (items G2, G3, G6) and “excitement” (items P4, P7, G8 and G14) factors [29, 30]. Depressive symptoms was assessed by the 17-item Hamilton Depression Rating Scale (HAMD) [31]. Four psychiatrists conducted the interview and the intra-class correlation coefficients of the above instruments across raters were >0.8 . Following other studies [19, 20], lifetime SA was inquired about by a standardized question: “did you ever attempt suicide?”. SA was also confirmed with family members. In addition, lifetime and current SIs were evaluated using the Chinese version of the 19-items Beck Suicide Ideation Scale (BSI-CV) [32].

Statistical Analysis

Analyses were performed using SPSS version 24.0 (SPSS Inc., Chicago, IL, USA). The normality of distribution of continuous variables was tested by the one-sample Kolmogorov-Smirnov test. Basic demographic and clinical characteristics between patients with and without SA were compared using either a t-test or the Mann-Whitney U test for continuous variables, and a χ^2 test for categorical variables. Demographic and clinical correlates of SA were entered in a multiple logistic regression model. The independent variables for logistic regression were selected based on preliminary bivariate tests that distinguished patients with and without SA. All statistical tests were two-sided and a significance level of 0.05 was chosen.

Results

Altogether, 333 patients were invited to participate in the study; of them, 315 met the study criteria and completed the assessment, giving a participation rate of 94.6%. The lifetime prevalence of SA was 22.2% (95%CI: 17.6–26.8%) (70/315). Among patients with SA, 61.4% (43/70) attempted once, 24.3% (17/70) attempted twice, and 14.3% (10/70) attempted three times or more. The lifetime and current prevalence of SI in the whole sample was 36.8% (95%CI: 31.5–42.2%) and 6.4% (95%CI: 3.6–9.1%), respectively.

As shown in Table 1, patients with SA were more likely to be women, married and have more severe depressive symptoms. Multivariate analyses revealed that women ($P < 0.001$, OR = 3.4, 95%CI: 1.9–6.0), married status ($P = 0.02$, OR = 2.2, 95%CI: 1.1–4.4) and having more severe depressive symptoms ($P = 0.014$, OR = 1.2, 95%CI: 1.01–1.3) were significantly and independently associated with higher risk of SA (Table 2).

Table 1 Demographic and clinical characteristics between the suicide attempters and non-attempters in schizophrenia

	The whole sample (n = 315)		Non-attempters (n = 245)		Attempters (n = 70)		Statistics		
	N	%	N	%	N	%	χ^2	df	p
Men	190	60.3	164	66.9	26	37.1	20.2	1	<0.001
Marriage							11.7	2	0.003
Single	148	47.0	125	51.0	23	32.9			
Married	90	28.6	59	24.1	31	44.3			
Divorced or deceased	77	24.4	61	24.9	16	22.9			
Financial perception							1.0	1	0.32
Bad	165	52.4	132	53.9	33	47.1			
Moderate and above	150	47.6	113	46.1	37	52.9			
Education							3.6	2	0.17
Illiterate or primary school	76	24.1	65	26.5	11	15.7			
Junior and senior high school	209	66.3	158	64.5	51	72.9			
University and above	30	9.5	22	9.0	8	11.4			
Smoker/nonsmoker	126/189	40.0	105/140	42.9	21/49	30.0	3.8	1	0.053
Comorbid medical conditions	60	19.0	47	19.2	13	18.6	0.01	1	0.91
	Mean	SD	Mean	SD	Mean	SD	T/Z	df	p
Age	45.1	11.7	45.3	12.1	44.3	10.1	-0.8	^a	0.44
Age of onset (years)	26.0	8.2	26.1	8.3	25.7	7.9	-0.4	^a	0.71
Duration of illness (years)	19.0	10.5	19.2	10.7	18.5	9.6	-0.2	^a	0.83
Hospitalization numbers	5.6	4.8	5.4	4.5	6.2	5.8	-0.8	^a	0.44
HAMD total score	9.5	4.9	9.1	4.8	10.7	5.4	-2.1	^a	0.037
PANSS									
Positive score	10.6	5.0	10.4	5.0	11.4	5.1	-1.7	^a	0.09
Negative score	17.6	7.1	17.8	7.2	16.7	6.6	-1.0	^a	0.30
Concrete/Disorganized score	9.0	2.9	9.1	3.0	8.6	2.5	-1.4	^a	0.17
Depressive score	6.9	2.8	6.6	2.7	7.8	2.9	-3.1	^a	0.002
Excited score	7.9	3.7	7.8	3.8	8.0	3.2	-1.0	^a	0.32

Bolded values: < 0.05; HAMD: Hamilton Depression Rating Scale; PANSS: Positive and Negative Syndrome Scale

Discussion

To the best of our knowledge, this was the first multi-center study to examine the prevalence and independent demographic and clinical correlates of SA in clinically stable schizophrenia inpatients in China. We found that 22.2% (95%CI: 17.6–26.8%) of patients in the whole sample had lifetime SA, which is in the range of 18–55% reported previously [33–35], but was higher than the fig. (17.6%; 95%CI: 9.0–31.7%) reported in a recent meta-analysis in Chinese schizophrenia patients [24]. This lifetime prevalence of SI was 36.8% (95%CI: 31.5–42.2%), which is also higher than that in Dong et al's meta-analysis (18.5%; 95%CI: 8.1–37.0%) [24]. There are several possible reasons for the higher SA in this study. First, the relatively underdeveloped economy in agricultural areas of China, such as Anhui province, may be associated with a higher risk for suicidality including SA [36]. Second, discrimination and stigma may be more pronounced in agricultural areas, which would make schizophrenia patients less likely to seek help, making them more isolated and depressed and at higher risk for suicidality [37].

Table 2 Multiple logistic regression analysis for associations with suicide attempts

	<i>P</i> value	Odds ratio	95% CI
Suicide attempters			
Sex	<0.001	3.4	1.9–6.0
Married	0.020	2.2	1.1–4.4
HAMD	0.443	1.0	1.0–1.1
Depressive score	0.014	1.2	1.0–1.3

Bolded values: < 0.05; HAMD: Hamilton Depression Rating Scale

Gender is usually associated with suicidality. We found that the risk for SA was 3.3 times higher in women than in men, which is consistent with findings in the Chinese general population [14]. Some studies found that men are more likely to die from suicide, whereas SAs not resulting in death and suicidal ideation are more common in women [38–41]. However, other studies have also reported higher suicide deaths among women in China compared to men [42, 43] but a systematic review reported that the gender difference in suicide deaths has disappeared since 2000 [44]. Certain sociocultural factors associated with female patients, such as lower economic and social status, more severe discrimination and stigma, and frequent family conflicts [45, 46], may account for the higher risk of suicidality. Women usually undertake housework at home in Chinese society, particularly in agricultural areas. Due to the impact of psychiatric symptoms and drug-induced side effects, their ability to perform housework may be impaired, which could lead to family conflicts and then increase the risk of suicidality. Women’s responsibility for housework has also been cited as a reason for shorter hospitalizations among women who require inpatient mental healthcare compared to men [47]. This may result in sub-optimal treatment outcomes, thereby increasing suicide risk.

In this study married patients were more likely to have SA, which is consistent with previous findings in community-dwelling patients with schizophrenia in China [19]. Being married is usually an indicator of better social functioning in Western societies due to family support [48, 49]. This may not be true in China where it was reported that unmarried females received greater social support than married counterparts because of their contact with teachers or supervisors and colleagues [50]. It may also be the case that initially well-connected and highly functioning people tend to develop a sense of hopelessness after getting mentally ill, possibly because of “losing face” or shame [19, 51, 52]. As expected, more severe depressive symptoms were associated with more frequent SA [18–20, 53].

The strengths of this study include the multicenter design and the inclusion of patients prior to discharge in agricultural areas of China. However, several limitations needed to be addressed. First, given the cross-sectional design, no causal relationship between SA and demographic and clinical variables can be inferred. Second, only psychiatric hospitals in Anhui were involved; therefore, the findings cannot be generalized to other agricultural areas of China. Finally, due to the stigma related to psychiatric disorders [54], SAs might be concealed by some patients and families, which could underestimate SA rate.

In conclusion, this study found that SA was common in stable schizophrenia inpatients in agricultural areas of China, particularly in female patients, married people, and those who had more severe depressive symptoms. In order to reduce

the risk of suicide, regular assessment and appropriate interventions and management approaches on suicide prevention should be integrated into the community-based psychiatric service model for this population.

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Compliance with Ethical Standards

Conflict of Interest The authors have no conflicts of interest concerning this article.

Human and Animal Rights All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent NA.

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