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Research paper

Prevalence of suicidal behaviors in patients with major depressive disorder in China: A comprehensive meta-analysis

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ABSTRACT

Background: Suicidal behaviors are common in major depressive disorder (MDD) and contribute significantly to premature death. The objective of this meta-analysis is to estimate the pooled prevalence of suicidal behaviors in patients with MDD in China.

Methods: The relevant databases in English (PubMed, Embase, PsycINFO and Cochrane Library) and Chinese (Chinese National Knowledge Infrastructure, Wanfang and Chinese Biological Medical Literature) were systematically and independently searched from their inceptions until January 23, 2017. Original studies that reported the prevalence of suicidal behaviors including suicidal ideation (SI), suicide plan (SP), suicide attempt (SA) and completed suicide (CS) were included.

Results: Thirty three articles that met the inclusion criteria were analyzed. The pooled lifetime prevalence of SI, SP and SA were 53.1% (95% CI: 42.4–63.4%), 17.5% (95% CI: 5.8–42.3%) and 23.7% (95% CI: 19.9–28.0%), respectively. One-month prevalence of SI and SA were 27.7% (95% CI: 15.4–44.5%) and 20.3% (95% CI: 12.1–32.2%), respectively. The pooled prevalence of SA during hospitalization and after onset of MDD were 17.3% (95% CI: 12.4–23.7%) and 42.1% (95% CI: 26.1–60.0%), respectively. Subgroup analyses revealed significant differences in both lifetime prevalence of SI and SA between genders, and between outpatients and inpatients with MDD.

Conclusion: Suicidal behaviors are common in MDD patients in China. Regular screening and effective intervention for suicidal behavior in MDD patients are warranted.

1. Introduction

Major depressive disorder (MDD) is a common psychiatric disorder which is associated with significant personal suffering, physical and mental disability (Üstün et al., 2004). A systematic review found that the global point prevalence of MDD was 4.7% (Ferrari et al., 2013b). However, lifetime prevalence of MDD ranged from 3% in Japan to 16.9% in the USA, while in other Western countries the figures varied between 8% and 12% (Andrade et al., 2003). In China, the prevalence of MDD was relatively lower than in Western countries, with lifetime prevalence of 3.3%, 12-month prevalence of 2.3% and point prevalence of 1.6% (Gu et al., 2013). Of note, MDD was the second leading cause of years lived with disability (YLDs) globally in 2010, accounting for 12.1% of total YLDs and 2.5% of total disability-adjusted life-years (DALYs) (Ferrari et al., 2013a).

Suicide is a leading public health problem worldwide, accounting for 1.4% of the total mortality globally in 2008 (Värnik, 2012). In China, suicide was the fifth leading cause of death, amounting to over 287,000 suicide deaths per year which is 3.6% of all deaths (Phillips et al., 2002a). Four forms of suicidal behavior including suicidal ideation (SI), suicide plan (SP) suicide attempt (SA) and completed suicide (CS) have been commonly studied (Lee et al., 2007; Nock et al., 2008; Scocco et al., 2008; Yoshimasu et al., 2008). Traditionally, SI refers to thoughts, fantasies and wishes about ending one's own life (Cai et al.,

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2016; Zhu et al., 2013), SP refers to having plans on how to end one's own life (Lee et al., 2007; Mu et al., 2016), while SA refers to the self-destructive act with intent to end one's own life (Grunebaum et al., 2001; Kao et al., 2012). SI, SP and SA are closely associated with CS (Harkavy-Friedman et al., 1999; WHO, 2012). For example, approximately 23.0% of the suicide completers had previously attempted suicide (Zhou and Jia, 2012). Mood disorders, particularly depression, was strongly predictive of suicidal behaviors (Yoshimasu et al., 2008). Approximately 90% of suicide completers and attempters had a psychiatric disorder, of which 40–70% were diagnosed with depression (Arsenault-Lapierre et al., 2004; Bertolote et al., 2004; Brådvik et al., 2010; Rihmer, 2007). Therefore, better understanding of the patterns of suicidal behaviors is necessary to implement effective suicide prevention strategies in patients with MDD.

Pattern of suicidal behaviors is however significantly influenced by political, economic and socio-cultural factors, which vary across different countries and settings (Cao et al., 2015a, 2015b). Several studies have examined the prevalence of suicidal behaviors in patients with MDD in China, but the prevalence range varied widely. For example, the lifetime prevalence of SA ranged from 7.3% (Gui and Xiao, 2009) to 48.4% (Zheng and Lin, 2010). Thus, we set out to conduct this meta-analysis to estimate the pooled prevalence of suicidal behaviors in patients with MDD in China and to examine their related factors. We included both English and Chinese databases since the latter is not readily accessible by the international readership.

2. Methods

2.1. Search strategy and selection criteria

Two investigators (MD and SBW) systematically and independently searched the databases in English (PubMed, Embase, PsycINFO and Cochrane Library) and Chinese (Chinese National Knowledge Infrastructure (CNKI), Wanfang and Chinese Biological Medical Literature (SinoMed)) from their inception until January 23, 2017. The following search terms were used: ("suicide*" or "self-injurious behavior" or "self-mutilation" or "self-immolation" or "self-harm" or "self-inflicted" or "self-injury" or "self-slaughter" or "self-destruction") and ("depressive disorder" or "depression" or "depress*") and ("epidemiology" or "cross-sectional study" or "prevalence" or "rate" or "cohort study" or "observational study") and ("China" or "Chinese" or "Hong Kong" or "Taiwan"). After the titles and abstracts were screened, the full texts of potentially eligible studies were identified. Article selection and data extraction were conducted independently by two investigators (MD and SBW), and any uncertainty about eligibility were resolved by consensus or a discussion with a third investigator (XYT).

2.2. Inclusion and exclusion criteria

Included studies needed to satisfy the following criteria: (1) patients with MDD established by DSM, ICD or China's mental disorder classification and diagnosis standard (CCMD) diagnostic system (Chen, 2002); (2) cross-sectional or cohort study; (3) available data on rate of suicidal behaviors including SI, SP, SA, or CS; (4) suicidal behaviors that were measured by standardized questionnaires or questions; (5) published in Chinese or English. Exclusion criterion was as follows: (1) studies reporting only depressive symptoms based on scales or questions; (2) studies focusing on special populations (e.g. adolescent, the elderly or postpartum depression); (3) retrospective studies; or (4) studies without timeframe of suicidal behaviors. If a dataset was used in more than one study, then only the study with the comprehensive information was included.

2.3. Data extraction

The relevant information was extracted by two independent investigators (MD and SBW) using a standardized data collection form, including author name, publication and survey year, study site (province), sample type (inpatients or outpatients), sampling method, sample size, diagnostic criteria for MDD, mean age, percentage of males, number of patients with suicidal behaviors, screening tools for suicidal behaviors and the timeframe. For cohort studies, only the baseline data were extracted.

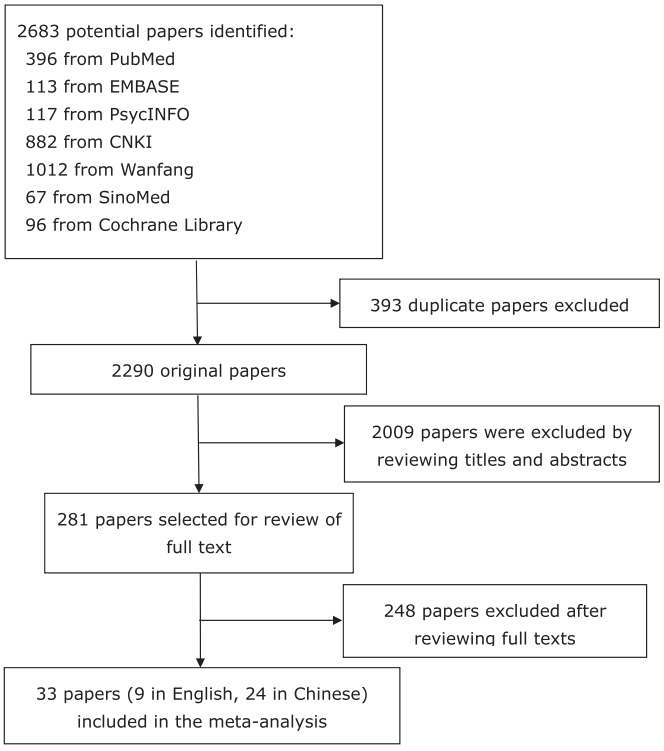

Fig. 1. Flowchart for selection of studies.

2.4. Quality assessment

The methodological quality of studies was evaluated by two independent investigators (MD and SBW) with a quality assessment instrument for epidemiological prevalence studies (Parker et al., 2008) using the following criteria: (1) target population was defined clearly, (2) sample size is appropriate, and random or consecutive sampling method was used, (3) the targeted sample is representative or the report presents evidence that the results could be generalized to patients with MDD, (4) the response rate was equal or greater than 70%, (5) the instruments used on suicidal behaviors is a validated measure with cutoff values. Given the significant association between the validity of results and sample size, an additional criteria of having a sample size of at least 400 was included (William and Strachan, 1997). A point was given when an included paper satisfied each item; the total scores were obtained by adding all items.

2.5. Statistical analysis

The Comprehensive Meta-Analysis (CMA) Version 2.0 (Biosta, Inc. USA) was used for analyses. The pooled prevalence and their 95% confidence intervals (95%CI) were performed with the random effects model. The I^2 statistic was used to assess heterogeneity across studies. Sensitivity and subgroup analyses were performed to examine the sources of heterogeneity when $I^2 > 50\%$. In addition, meta-regression was used to explore the relationship between sample size and suicidal behaviors. Publication bias was evaluated by the funnel plots with visual inspection. $P < 0.05$ (2-sided) was considered to be statistically significant.