Suicide Risk Associated With Dual Diagnosis in General Population

Diana Restrepo, MSc(Epidemology), MD, Natalia Gutierrez-Ochoa, MD, Carolina Rodriguez-Echeverri, MD, and Gloria Sierra-Hincapie, MSc(Epidemology)

Abstract

Objectives:
The main objectives of this study were to compare the risk of suicide, sociodemographic and clinical characteristics in 3 designated groups: dual diagnosis (DD), substance-related disorder without other co-morbid mental disorder, and any mental disorder without the presence of co-occurring substance-related disorders.

Materials and Methods:
This was a cross-sectional study with secondary information source from a population study. Adults of both sexes between 19 and 65 years of age were included and were screened for 23 mental disorders, the data collection tool used was the Compositum International Diagnosis Interview (CIDI 3.0), which uses DSM IV diagnostic criteria. Suicide risk in individuals with DD and other mental disorders was compared.

Results:
In total, 303 adults between 19 and 65 years of age were included. In all, 63% were women. The median age was 41 and the interquartile range 21. The prevalence of DD was 2.0% in the last 12 months and the prevalence of suicidal behavior was 7.6%, any substance abuse disorder 4.8%, any mental disorder without substance abuse 17.4%. An association of suicidal behavior with DD was found [odds ratio (OR), 13.85; 95% confidence interval (CI), 2.62-73.09] with grouped substance-related disorder (OR, 9.61; 95% CI, 2.49-37.00) and grouped mental disorders (OR, 4.97; 95% CI, 2.07-11.92).

Conclusions:
A higher risk of suicide was found in DD compared with noncomorbid mental disorders or substance-related disorder.

Key Words: dual diagnosis, mental disorder, comorbidity, suicide, substance-related disorder

(Addict Disord Their Treatment 2019;18:89–93)

INTRODUCTION

Dual diagnosis (DD) also known as comorbid disorder, is a concept that denominates the occurrence of a mental disorder and substance use disorder simultaneously.1 It can be established sequentially or parallel through the life cycle of an individual.2 It is a diagnostic category that demands training and coordination in health systems in order to provide the integral care required by these patients.3

Suicide is a complex behavior that explains 800,000 deaths/y in the world. Represents 1.4% of all deaths in 2012, with a rate of 11.4 per 100,000 inhabitants.4 In 2016 in Colombia, 18,910 cases of suicide attempts were reported, 63% were women and 37% were men.5 In the population where the study was executed, the suicide rate in 2016 was 64.7 per 100,000 inhabitants.6

There are multiple risk factors that act proximally and distally to create and determine suicidal behavior. There is a notorious association between suicide and mental disorders, the latter being present in 90% of patients with suicide.7 In patients with affective disorders, the risk is highest and it has been estimated to be between 15% and 19%.8,9 In patients with substance-related disorder there is significant association between substance use disorder, suicidal ideation, suicide attempt, and accomplished suicide.10 The objective of this study was to compare the suicidal risk and sociodemographic and clinical characteristics associated with the risk in 3 groups of people: DD, substance-related disorder without other comorbid mental disorder, and any mental disorder without the presence of co-occurring substance-related disorders.

From the CES University, Medellín, Colombia.

The study was approved by the University Research Committee. Patient’s anonymity was carefully protected, and this investigation was performed with informed consent, following the guidelines for investigation with human subjects required by the CES University, in which one, all the authors are affiliated.

The authors declare no conflict of interest.

Reprints: Diana Restrepo, MSc (Epidemology), MD, CES University, Calle 10a #22-04, Medellín, Colombia (e-mail: dianarestrepobernal@gmail.com).

Copyright © 2018 Wolters Kluwer Health, Inc. All rights reserved.
training and coordination in health systems in order to provide the integral care required by these patients. Suicide is a complex behavior that explains 800,000 deaths per year in the world. It represented 1.4% of all deaths in 2012, with a rate of 11.4 per 100,000 habitants. In 2016 in Colombia, 18,910 cases of suicide attempts were reported, 65% were women. In the population where the study was executed, the suicide rate in 2016 was 64.7 per 100,000 habitants.

Multiple risk factors determine suicidal behavior. There is a notorious association between suicide and mental disorders, the latter being present in 90% of patients with suicidal behavior. In patients with affective disorders, the risk is highest and it has been estimated between 15% and 19%. Patients with substance-related disorder have a significant association with suicidal behavior (ideation, attempt, and realization).

The aim of this study was to compare the suicidal risk and sociodemographic and clinical characteristics associated with the risk in 3 groups of people: DD, substance-related disorder, and any mental disorder alone.

MATERIALS AND METHODS

The present study is cross-sectional, based on a secondary information source, using the data base of “Primer Estudio de Salud Mental de Itagüí, 2012” in general population. This study excluded institutionalized or homeless persons, and included people between the ages of 13 and 65 years. The inquiry was carried out in a probabilistic sample of 896 people, calculated on 189,882 people in 6 communes. The instrument used was CIDI 3.0 version CAPI, a highly structured interview designed by The World Health Organization with The Alcohol Drug Abuse and Mental Health Administration to be applied by laity interviewers trained for this purpose. It has been used on a large scale in transcultural psychiatric epidemiologic studies around the world and it is the official instrument in the “World Mental Health Survey Initiative.” The language is simple to understand and the instrument has 2 parts: the first is for screening people at risk of suffering any mental disorder and the second, has estimated prevalences of 21 specific disorders according to DSM IV. The first phase of the study was applied to 896 people selected by sample design; of these, 255 tested positive for mental disorder and were designated to complete the second phase of the test. Of the negative subgroup, 25% were randomly selected to answer the second part of the interview. The second phase was applied to 415 people. The data presented here were calculated on 303 individuals from 19 to 65 years of age.

The mental disorders included were: panic, generalized anxiety, agoraphobia, posttraumatic stress disorder, obsessive compulsive disorder, social phobia, major depression, dysthymia, bipolar disorder (I and II), and substance abuse (alcohol and other drugs).

The dependent variable was suicidal behavior (ideas, plans, and attempts) and the independent variables were: sociodemographic (age, sex, educational level, marital status, and employment in life), clinical (anxiety and affective disorder group according to DSM IV, substance-related disorder, alcohol and other drugs, except tobacco), and DD (defined earlier in the article).

The variable suicidal behavior was compared in the following groups: (1) dual pathology, (2) substance-related disorder, and (3) other mental disorder.

A descriptive analysis of the sociodemographic and clinical variables was also performed. The prevalence of suicidal behavior between the different groups was used as epidemiological indicators.

An association between suicidal behavior and the independent variables was sought, the odds ratio (OR) was calculated, with its respective 95% confidence interval (CI) and a level of significance of 5%. To establish the association between qualitative variables, $\chi^2$ independence test was used.

A binary regression model was applied and it included the variables that met the Hosmer-Lemeshow criterion ($<0.20$) in the bivariate analysis.

An explanatory model of the suicidal behavior of the preestablished groups was constructed and adjusted odds ratios were obtained for the independent variables included. The assumptions of...
binary logistic regression were verified since: no multicollinearity was found (after using variance inflation factor), and, there was independence in the errors (according to Durbin-Watson statistic \( d = 2 \)). The following values were used as reference: tolerance \(-0.1\), and for multicollinearity problems, variance influence factor results were categorized from \(<1, 1\) to 5, and \(>10\), representing no, moderate and high multicollinearity, respectively.

The information was analyzed with the software SPSS, Chicago version 21.0, license covered by CES University. To increase the quality of scientific communication in the health area, this manuscript was examined with Strengthening the Reporting of Observational Studies in Epidemiology (STROBE).11

RESULTS

Descriptive Analysis

In total, 303 adults between 19 and 65 years of age were included. In total, 63.0% were women. The median age was 41 years and the interquartile range was 21. The other sociodemographic variables are presented in Table 1.

The prevalences found in the study were the following: for lifetime suicidal behavior the prevalence was 19.9% and for DD, 7.9%; compared with last year, the prevalence for suicidal behavior was 7.6% and for DD, 2.0%.

In the bivariate analysis, the dependent variable (suicidal behavior) was crossed with the other variables included in the study. A strong association was found between suicidal behavior and DD (OR, 13.85) with a greater magnitude compared with affective disorder and substance-related disorder. Moreover, association was found with age and quest for mental health care (Table 2).

A multivariate binary logistic regression model was constructed with the enter method, to which the variables that showed association or value of \( P<0.20 \) (Hosmer-Lemeshow test) were obtained adjusted odds ratios. The final model included 4 variables (affective disorder, substance-related disorder, ages between 19 and 30 years and search for mental health care). These 4 variables explain 31% of the variance for suicidal behavior (Table 3). The assumptions of the binary logistic regression were verified: (1) no multicollinearity (variance inflation factor), and (2) independence of the mistakes (Durbin-Watson \( d = 2 \)), for this model the statistician reported a \( d = 1.96 \).

DD was not included in the model, which is explained by a collinearity problem, this means that the variables are providing similar or redundant information. This is verified through tolerance and variance inflation factor, where any substance-related disorders and DD presented the tolerance values of 0.311 and 0.278, respectively. Likewise, the values of the variance inflation were taken into account with 3.214 and 3.591, respectively, which indicates a moderate collinearity (Table 3).

DISCUSSION

The main finding of this study was the strong association between DD and suicidal behavior in general population. The magnitude of this association was...
greater than the association found between independent mental disorders and substance-related disorders.

In a study performed in a clinical population, Szerman et al \cite{12} compared suicide risk in 837 outpatient classified in 3 groups: (1) DD, (2) substance-related disorder, and (3) other mental disorders. They found that patients with DD had a higher suicidal risk than patients with other mental disorders (OR, 2.15; 95% CI, 1-21) and patients with substance-related disorder (OR, 14.6; 95% CI, 6-22). In our study, the magnitude of the suicide risk associated to dual pathology was higher (OR, 13.85) compared with affective disorders (OR, 10.13) and substance abuse disorder (OR, 5.50). Although Szerman and colleagues study is similar to ours in terms of the 3 comparison groups, it was made in a different population.

Youssef et al \cite{13} conducted a case-control study that included 239 patients aged between 18 and 45 years. In total, 122 controls with polydrug use defined as meeting criteria for ≥ 2 substance-related disorder according to DSM IV TR. The prevalence of DD was 82.79% and a significant association was found between DD and suicidal probability according to suicidal scale risk \(P < 0.001\).

The results of these studies support the hypothesis of an increased suicide risk in individuals with DD, even if there are differences between their populations: the former was clinic based and ours was a population study.

TABLE 2. Comparison of Suicidal Behavior (Last Year’s Prevalence) With Mental Disorder Group (Last Year’s Prevalence)

<table>
<thead>
<tr>
<th>Mental Disorders</th>
<th>(\chi^2)</th>
<th>P</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any mental disorder</td>
<td>15.189</td>
<td>&lt;0.0001</td>
<td>4.97 (2.07-11.92)</td>
</tr>
<tr>
<td>Anxiety disorders group</td>
<td>3.084</td>
<td>0.088</td>
<td>2.28 (0.88-5.87)</td>
</tr>
<tr>
<td>Affective disorders group</td>
<td>42.085</td>
<td>&lt;0.0001</td>
<td>13.34 (5.17-34.40)</td>
</tr>
<tr>
<td>Substance-related disorder</td>
<td>15.485</td>
<td>0.004</td>
<td>9.61 (2.49-37.00)</td>
</tr>
<tr>
<td>Dual diagnosis</td>
<td>15.695</td>
<td>0.007</td>
<td>13.85 (2.62-73.09)</td>
</tr>
<tr>
<td>Sex</td>
<td>0.453</td>
<td>0.501</td>
<td>1.34 (0.57-3.17)</td>
</tr>
<tr>
<td>Age</td>
<td>5.341</td>
<td>0.021</td>
<td>2.70 (1.13-6.47)</td>
</tr>
<tr>
<td>Level of education</td>
<td>0.372</td>
<td>0.542</td>
<td>1.31 (0.55-3.13)</td>
</tr>
<tr>
<td>Live alone</td>
<td>8.817</td>
<td>0.003</td>
<td>4.21 (1.52-11.66)</td>
</tr>
<tr>
<td>Employment in life</td>
<td>0.913</td>
<td>0.339</td>
<td>0.65 (0.25-1.62)</td>
</tr>
<tr>
<td>Social security</td>
<td>0.002</td>
<td>0.965</td>
<td>0.98 (0.39-2.47)</td>
</tr>
<tr>
<td>Quest for mental health care</td>
<td>13.713</td>
<td>&lt;0.0001</td>
<td>4.98 (1.98-12.56)</td>
</tr>
</tbody>
</table>

CI indicates confidence interval; OR, odds ratio.

TABLE 3. Comparison of Bivariate and Multivariate OR From Binary Logistic Regression Model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Bivariate Model [OR (95% CI)]</th>
<th>Multivariate Model [OR (95% CI)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective disorders group</td>
<td>13.34 (5.17-34.40)</td>
<td>10.13 (3.50-29.34)</td>
</tr>
<tr>
<td>Substance-related disorder group</td>
<td>9.61 (2.49-37.00)</td>
<td>5.50 (1.18-25.70)</td>
</tr>
<tr>
<td>Age (19-30 y)</td>
<td>2.70 (1.13-6.47)</td>
<td>3.10 (1.10-8.74)</td>
</tr>
<tr>
<td>Mental health service user</td>
<td>4.98 (1.98-12.56)</td>
<td>3.32 (1.18-9.33)</td>
</tr>
</tbody>
</table>

CI indicates confidence interval; OR, odds ratio.
In our study, the strongest association was found between suicidal behavior and DD. In second place the association between suicidal behavior and any affective disorder and in last place, the association between suicidal behavior and substance-related disorders.

These findings are in line with Dr Kessler work, who performed a survival analysis for mental and substance-related disorders and concluded that mental disorders were strong predictors for substance-related disorder (OR, 1.6 to 7.5),13,14 which means that the affective or anxious disorder appear first followed by the substance abuse disorder. Among the strengths of this study are: (1) population study; (2) probabilistic sampling; (3) use of a highly structured psychiatric interview used in large epidemiological studies worldwide; (4) as opposed to most of the previously published studies of dual pathology, our study includes a greater number of mental and substance-related disorders. All of the previously mentioned qualities lead us to believe that these results appropriately reflect what happens in the population of study.

The study had the following limitations: (1) the selection of the population excluded homeless and institutionalized people, who are known to be vulnerable population for DD; (2) it is not possible to guarantee whether people respond truthfully to sensitive issues such as those addressed in CID (3) results based on spontaneous statements may be influenced by memory biases. However, the data collected were from the last 12 months to avoid this limitation to the maximum. Despite these limitations, the study offers valuable information on suicidal behavior in people with DD and may allow those who administer mental health resources to be more aware of people with dual pathology since, as it has been shown in this study, these patients present a higher risk of suicide.

REFERENCES