ORIGINAL ARTICLE

Dual Diagnosis and Suicide Probability in Poly-Drug Users

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ABSTRACT

Objective: To determine the frequency of suicidal thoughts and suicidal probability among poly-substance abusers in Saudi population, and to examine the relation between dual diagnosis and suicidal thoughts.

Study Design: Case control study.

Place and Duration of Study: Al-Baha Psychiatric Hospital, Saudi Arabia, from May 2011 to June 2012.

Methodology: Participants were 239 subjects, aged 18 - 45 years. We reviewed 122 individuals who fulfilled the DSM-IV-TR criteria of substance abuse for two or more substances, and their data were compared with that collected from 117 control persons.

Results: Suicidal cases were highly present among poly-substance abusers 64.75%. Amphetamine and cannabis were the most abused substances, (87.7% and 70.49%, respectively). A statistically significant association with suicidality was found with longer duration of substance abuse ($p < 0.001$), using alcohol ($p=0.001$), amphetamine ($p=0.007$), volatile substances ($p=0.034$), presence of comorbid psychiatric disorders (dual diagnosis) as substance induced mood disorder ($p=0.001$), schizo-affective disorder ($p=0.017$), major depressive disorders ($p=0.001$), antisocial ($p=0.016$) and borderline ($p=0.005$) personality disorder. Suicidal cases showed significant higher scores ($p < 0.001$) of suicide probability scale and higher scores in Beck depressive inventory ($p < 0.001$).

Conclusion: Abusing certain substances for long duration, in addition to comorbid psychiatric disorders especially with disturbed-mood element, may trigger suicidal thoughts in poly-substance abusers. Depression and suicide probability is common consequences of substance abuse.

Key Words: *Beck depressive inventory. Depression. Dual diagnosis. Poly-drug abuse. Suicidal thoughts. Suicide probability scale.*

INTRODUCTION

Prevalence of actual substance abuse among youths has nearly doubled over the past decade.[1] Substance abuse is associated with suicidal ideation and suicide. This is attributed to the intoxicating and disinhibiting effects of many psychoactive substances.[2] Suicide rates are increasing all over the world including Saudi Arabia.[3] Beck (1986) defined suicidal ideation as the presence of thoughts or contemplation about suicide or a wish of an individual to terminate his or her life, but there is no self destructive action related to these thoughts.[4] Suicidal thoughts and behaviors are a significant indicator of other co-occurring disorders.[5] So, psychiatric co-morbidity with substance use increases the risk for suicidal behavior.[6]

Assessment of these links is important to identify predictors for suicide in substance abusers to develop specific interventions for persons in substance abuse treatment.

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The objective of this study was to examine the relation between dual diagnosis and suicidal thoughts, investigate probability of suicide and severity of depression in suicidal substance abusers.

METHODOLOGY

This case-control study was conducted at Al-Baha Psychiatric Hospital in Saudi Arabia, from May 2011 to June 2012. The presumptive prevalence of substance abuse among this study population was 7.8%.[7] The calculated sample size per group was around 122 according to the following equation:

$n = (z/e)^2 (p) (1 - p)$

Where, n = the sample size per group, p = the expected prevalence = 7.8%, z = the critical value which determines the area underlying the 95% of population on the normal distribution curve = 1.96, and e = the margin of sample error tolerated = 0.05; so that $n = (1.96/0.05)^2 \times (0.078) \times (1- 0.078) = 111$. The expected drop-out was 10%, so the total sample size was taken as 122.

Cases (n=122) were identified as male in-patient, aged 18 - 45 years, who met the criteria of diagnostic and statistical manual of mental disorders, fourth edition (DSM-IV-TR) for psychiatric diagnosis of substance abuse, and who were abusing two or more substances. They were assessed after the period of de-toxification and withdrawal. Patients were classified into suicidal and non-suicidal according to the presence of a lifetime history of suicidal ideation or attempt (Grohol 2012).[8]

The controls (n=117) are male subjects who never had the experience of taking illicit substances, and not suffering from any current or past-psychiatric disorders or serious medical disease. Controls were matched for age and residential environment and chosen from employees, workers in the hospital, and their relatives and friends.

Sample was selected by systematic random sampling. There are about 225 - 273 cases suffering poly-substance abuse admitted to the hospital yearly, while the sample size was 122, so the interval was taken as 273/122 = 2, calculated as K=N/n, where “K” is the interval, “n” is the sample size, and “N” is the population size. The first case was chosen randomly then every 2nd case was selected to fulfill the required sample size, which is 122 cases.

Written informed consents were obtained from the participants. Information from family members were gathered in some cases. Participants were examined after detoxification and were subjected to psychiatric history and mental state examination. Full physical, neurological examination, routine laboratory tests (CBC, blood chemistry {blood glucose level, renal function test, liver function test, serum electrolyte, and lipid profile}, and urine analysis), urine and blood toxicology screen {for opioid, amphetamine, alcohol, cannabis, benzodiazepine, and barbiturate} and ECG were done in order to exclude serious organic pathology. Modified semi-structured Questionnaire for the drug intake and the assessment of socio-demographic data[9] was used. Additionally, a suitable semi-constructed interview of modified Ain Shams University case sheet[10] was also conducted. The standardized Arabic versions of suicidal probability scale for assessment of suicidal probability[11] and of Beck Depression Inventory Scale (BDI) for quantitative assessment of the intensity of depression[12] were used.

The collected data were organized, tabulated and statistically analyzed using software statistical computer package (SPSS) version 16. For quantitative data, the mean and standard deviation were calculated. For qualitative data, comparison between the groups was done using chi-square test (χ^2). For comparison between mean values of two groups of parametric data, student t-test was used. For comparison between more than two mean values, the F-value of analysis of variance (ANOVA) was calculated, where Tamhane`s T2 test for unequal variances was performed to compare each two means, if F-value was significant. For all tests, p-value less than 0.05 was considered as statistically significant.

RESULTS

The sample consisted of 122 cases (79 suicidal cases and 43 non-suicidal cases) and 117 controls. Five participants from the control group were considered as drop-out because they did not finish the psychometric tests. Suicidal thought and probability was high among poly-substance users (64.75%), and (22.13%) of cases have history of at least one suicide attempt. The difference between mean age of all cases (31.35 ±6.25) and controls (31.66 ±7.84) was not significant (p= 0.74).

Table I shows that one way ANOVA test revealed significantly lower (p=0.003) mean age of non-suicidal group (28.47 ±5.78) than that of the mean age of the other two groups (suicidal 32.92 ±5.95, controls 31.66 ±7.84) confirmed by post-hoc test (Tamhane's T2).

Table II shows that amphetamine and cannabis dominated the list of substances abused in the present study. Amphetamine was the most commonly abused substance (87.7%), followed by cannabis abuse (70.49%). Amphetamine (p=0.007), alcohol (p=0.001) and volatile substances (p=0.034) were significantly higher in suicidal cases than non-suicidal.

Thirty-nine patients (31.97%) started substance use before the age of 18 years. There was no significant association between the age of beginning of substance abuse and suicidal thoughts or behaviors. But duration of substance intake was very high, significantly associated with suicidal thoughts or behavior (p < 0.001).

Table III shows that co-morbidity of substance abuse with another mental illness (dual diagnosis) was well established in 101 cases (82.79%) diagnosed as schizophrenia (16.39%), schizo-affective disorder (2.46%), bipolar-I disorder (16.39%), major depressive

Table I: Age of participants.

Age	Controls (n=117) Mean (±SD)	Cases (n=122)		p-value
		Non-suicidal (n = 43) Mean (±SD)	Suicidal (n = 79) Mean (±SD)	
	31.66 ±7.84	28.47 ±5.78	32.92 ±5.95	0.003**a,c

According to post hoc tests:

a = Statistical significant difference between control and non-suicidal groups.
b = Statistical significant difference between control and suicidal groups
c = Statistical significant difference between non-suicidal and suicidal groups
**p-value <0.05 = significant*
***p-value <0.01 = highly significant*
****p-value <0.001 = very highly significant*

Table II: Types and condition of substance abused by cases.

Variable	Non-suicidal (n=43)	Suicidal (n=79)	p-value
Substance abused n (%)			
Amphetamine 107 (87.7)	33 (76.74)	74 (93.67)	0.007**
Cannabis 86 (70.49)	27 (62.79)	59 (74.68)	0.169
Alcohol 46 (37.7)	8 (18.6)	38 (48.1)	0.001**
Volatile substance 27 (22.13)	5 (11.63)	22 (27.85)	0.034*
Minor tranquilizer 33 (27.01)	14 (32.56)	19 (24.05)	0.312
Age of onset of S.A n (%)			
≤ 18	11 (25.58)	28 (35.44)	0.264
>18	32 (74.42)	51 (64.56)	
Duration of S.A in years mean (±SD)	6.09 ±3.84	10.58 ±7.05	<0.001***

**p-value < 0.05 = Significant; **p-value < 0.01 = High significant; ***p-value < 0.001 = Very highly significant*

Table III: Diagnosis according to revised fourth edition of diagnostic and statistical manual of mental disorders (DSM IV-TR).

Psychiatric diagnosis	Cases (n=122)		p-value
	Non-suicidal (n=43) n (%)	Suicidal (n=79) n (%)	
Substance induced disorders:			
*Substance induced mood disorder	5 (11.63)	32 (40.51)	0.001**
*Substance induced psychosis with onset during intoxication	19 (44.19)	34 (43.04)	
Schizophrenia	10 (23.26)	10 (12.66)	0.131
Schizo-affective disorder	3 (6.98)	0 (0)	0.017*
Bipolar	7 (16.28)	13 (16.46)	0.98
Depression	1 (2.33)	21 (26.58)	0.001**
Anxiety	1 (2.33)	3 (3.79)	0.663
Adjustment	0 (0)	3 (3.79)	0.196
Personality disorder			
Anti-social	9 (20.93)	5 (6.33)	0.016*
Borderline	0 (0)	13 (16.46)	0.005**
Avoidant	1 (2.33)	1 (1.27)	0.66
Physical disorders	5 (11.63)	12 (15.19)	0.59
Psychosocial stress			
Educational	7 (16.28)	3 (3.79)	0.016*
Occupational	15 (34.88)	33 (41.77)	0.457
Financial	15 (34.88)	5 (6.33)	< 0.001***
Relational	11 (25.58)	20 (25.32)	0.97

**p-value < 0.05 = Significant; **p-value < 0.01 = High significant; ***p-value < 0.001 = Very highly significant*

disorder (18.03%), anxiety disorder (3.28%), adjustment disorder (2.46%), and personality disorder (23.77%). Substance induced mood disorder (p=0.001), schizo-affective disorder (p=0.017), major depressive disorders (p=0.001), anti-social (p=0.016) and borderline (p=0.005), personality disorder had a significant association with suicidality.

Suicidal cases got significant higher scores compared to non-suicidal cases regarding Suicide Probability Scale (88.82 ±22.66 vs. 58.33 ±11.76, respectively) and Beck Depressive Inventory (27.43 ±13.19 vs. 12.53 ±4.99, respectively) both at p < 0.001.

DISCUSSION

Suicide is a significant social problem and, theoretically, a preventable cause of death. It is the third leading cause of death among juveniles and young adults, and ranks eighth for all ages.[13]

Drug and alcohol consumptions generate other circumstances in a person's life, which may worsen depression or produce mental agitation. Divorce, loss of job, legal trouble, and financial difficulties often grow from a dependence on alcohol or drugs and can bring about thought of suicide.[6]

The present study has shown that suicidal patients, who had experienced at least one suicidal thought, were more frequent among poly-substance users 64.75% as compared to the control group which had none. There were 22.13% of substance abusers with history of at least one suicide attempt. The results of this study agree with the findings of previous researchers linking substance abuse to suicide.[14]

Suicidal group recorded significant higher mean age (32.92 ±5.95 years) than non-suicidal patients. This result was not inconsistent with a previous study which reported that older age was protective against suicidal ideation.[15] This difference can be explained by the fact that older individuals may have longer duration of drug use, more physical illness and more accumulated social and financial troubles, which may contribute in provocation of suicidal thoughts among them.

Amphetamine, alcohol and volatile substances abuse were found to have significant relation with suicidal thoughts or behaviors in this study. These results were consistent with a previous study which found that the use of stimulant was more closely associated with a self-reported incidence of attempted suicide than use of marijuana, or injected drugs.[16] Roy recorded significantly more patients who had attempted suicide with a life-time history of alcoholism.[17] In addition, long-term consumption of alcohol leads to depression, which in turn increases the probability of suicide.[16]

Alcohol myopia asserts that acute alcohol consumption restricts the attention to be directed to the immediate salient stimuli, and consequently may block inhibitory impulses. The disinhibition produced by intoxication may facilitate suicidal ideas and increase the likelihood of suicidal thoughts being put into action, often on impulse. According to Baumeister in escape theory, alcohol and suicidal behavior both can be used to "…escape from meaningful awareness of current life problems and their effect on self".[18]

McGarvey *et al*. reported that adolescents with past inhalant use were more hopeless and depressed than those with no inhalant use history. In a study of youths on probation, inhalant users reported significantly more lifetime thoughts of suicide and suicide attempts.[19]

In this study, there was no significant relation of the age of beginning of substance abuse and suicidal thoughts or behaviors. But duration of substance intake was the important factor which showed very high significance. The mean duration was found to be significantly higher (10.58 years) in the suicidal group. This is consistent with previous study by Sabry who reported that suicidal probability was significantly higher in group with longer duration of substance use.[20]

However, in another study, clinical characteristics of attempters among poly-substance abusers and alcoholics were examined by Landheim. He reported that a substance use disorder with duration of ≥ 15 years and an early onset (< 18 years of age) were independently associated with being a suicide attempter after controlling for Axis-I disorders.[21]

Comorbidity of substance abuse problem with another mental illness (dual diagnosis) was well established in 101 cases (82.79%), diagnosed with various psychiatric illness as given in results. Substance induced mood disorder, schizo-affective disorder, major depressive disorders, antisocial and borderline personality disorder had a significant association with suicidality. These findings were supported by Lukasiewicz *et al*. who recorded that dual diagnosis showed strong association with suicide risk among a sample of French prisoners, majority having a substance use disorders with a mood disorder.[22] In addition, Ulrich reported higher risk for future suicide attempts in substance users in those with mood disorders and personality disorders.[23]

Suicide probability scale was assessed for cases. Data showed significantly high scores in suicidal group. These results were matching with Rutter study on drug users, who also recorded that SPS had a correlation with suicidality.[24]

Beck Depressive Inventory (BDI) was assessed for cases, and suicidal cases got significant higher scores compared to non-suicidal cases ($p < 0.001$). The present results were consistent with other research aimed to study the frequency of suicide attempts and clinical characteristics of attempters among poly-substance abusers which were examined by Landheim. He reported that a major depression is strongly and independently associated with being a suicide attempter.[21]

CONCLUSION

This study demonstrated that associative abusing certain substances for long duration, in addition to co-morbid psychiatric disorders especially with disturbed-mood element may trigger suicidal thoughts in poly-substance abusers. Depression and higher suicide probability are common consequences of substance abuse.

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