Low quality of life in depressed female smokers: results of a clinical trial

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Introduction

Unipolar and bipolar depression, as well as tobacco use disorder (TUD) have a significant global burden arising from heightened levels of chronicity, progressive disability and premature death. These disorders represent the leading causes of disability-adjusted life years. The most common tobacco-related diseases are cardiovascular illnesses, chronic obstructive pulmonary disease and cancer. Neoplasia, cardiovascular and respiratory diseases also affect bipolar disorder (BD) patients. TUD associates with a wide array of medical conditions as a consequence of chronic inflammatory process. Despite the raised awareness of tobacco-related diseases, rates of tobacco use are increasing in young females. There is a relationship between smoking and depression, which may be of particular relevence in women, given that women have higher rates of depression and anxiety (ROEHR, 2013). Women who quit smoking exhibit similar levels of depressive symptomatology as current smokers. TUD is a vulnerability factor for the development of severe depressive and anxiety symptoms.

Furthermore, a history of mood disorders increases the risk of early onset cigarette smoking, as well as to progression from daily smoking tonicotine dependence. TUD is highly comorbid with mood disorders, including (BD) and major depressive disorder (MDD). In the National Comorbidity Survey, nearly 61.3% of people with a lifetime history of panic disorder and 68.4% with generalized anxiety disorders were current or past smokers, while only 39% of smokers showed no evidence of a psychiatric disorder. In major depressive disorder, TUD prevalence ranges from 40% to 64% across studies. Nicotine-dependent smokers are twice as likely as non-smokers to have a history of depression (LASSER et al., 2016). Such studies indicate an intimate interaction of TUD and mood dysregulation. This common co-occurrence of TUD and mood disorders has generated a number of theoretical explanations, including: cigarette smoking has anti-depressant effects, being a form of self-medication; TUD, BD and MDD share common environmental or genetic risk factors; BD and MDD are a consequence of brain dysfunction, which is worsened by TUD.

The present study evaluated clinical differences between females with mood disorders, either bipolar depression or MDD, when either comorbid, or not, with TUD.

Methodology

This study included non-depressed female and never-smokers ($n = 28$), non-depressed smokers female ($n = 24$), depressed never-smokers female ($n = 38$), and depressed smokers

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female ($n = 69$). Female smokers were outpatients recruited from the Cigarette Smoking-Cessation Service Center, Londrina State University (UEL). Depressed female were patients with BD or MDD, who were recruited from the outpatients Psychiatric Ambulatory Clinic (UEL). Control participants were regarded as non-depressed and never-smokers if they reported never having smoked a cigarette or have smoked < 100 cigarettes intheir lifetime, coupled to no previous experience of a mood disorder. Controls were recruited from the staff at the same institution. All participants were women aged 18-65 years. All participants completed a questionnaire, which comprised socio-demographic data (education, occupation, marital status years of education). Trained psychiatrists carried out the clinical assessments. Anxiety severity was assessed through Hamilton Anxiety Rating Scale (HAM-A) (HAMILTON, 1959). Severity of depression was assessed through 17-item Hamilton Depression Rating Scale (HDRS17) (HAMILTON, 1960). Quality of life was evaluated using the World Health Organization Quality of Life Instrument, abbreviated version (WHOQOL-BREF), comprised by 26 items, measuring the following broad domains: physical health, psychological health, social relationships and environment. This instrument was translated and adapted to Portuguese e (FLECK et al., 2000). The Childhood Trauma Questionnaire (CTQ) is a self-administered instrument used to document a history of childhood maltreatment in 5 domains: sexual abuse, physical abuse, emotional abuse, emotional neglect and physical neglect (BERNSTEIN et al., 2003).

Statistical analyses were performed to examine the relationship between clinical measurements. ANOVA was used for quantitative comparisons among groups (mood disorder smokers; mood disorder never-smokers; non-mood disorder smokers; non-mood disorder, never-smokers), followed by the Tukey test when the assumptions were attended (homogeneity of variances and normality of the residuals). If these criteria were not met, the Kruskal-Wallis test was used, followed by a post hoc test. The statistical significance level used was 0.05 and when the p-value is < 0.05, the means are followed by letters. The same letters for the same variable indicate that there are no differences among the groups and different letters for the same variable indicate that there are differences among the groups. All the analyses were performed in software R (R CORE TEAM, 2019).

Results

The clinical data of all groups are shown in Table 1. Groups did not differ with respect to age. Comparing female non-smokers/non-mood disorders versus female bipolar/unipolar smokers, we may conclude that the average for years of educations and quality of life had the best results, i.e. more years of education and better quality of life scores on the WHOQOL-BREF in all domains ($p<0.01$) for the first group. Depressed, versus non-depressed, smokers and never-smokers scored higher for depressed symptoms on the HDRS17 and also for anxiety symptoms, as indicated on the HAM-A scale ($p< 0.01$).

Depressed, smokers and never smokers versus non-depressed never smokers experienced more childhood trauma, including emotional abuse, and physical abuse ($p < 0.001$). Only depressed non-smokers, versus non-depressed never-smokers had significant difference for childhood sexual abuse ($p < 0.01$).

Higher body mass index is likely to be associated with depressed never-smokers compared to non-depressed never smokers ($p< 0.01$).

Table 1: Clinical characteristics of the four study groups

Variable	Female non-smokers, non-mood disorders (n = 28)	Female smokers, non mood disorders (n = 24)	Female Bipolar/Unipolar never-smokers (n = 38)	Female Bipolar/Unipolar smokers (n = 69)	p−value*
Age (years)	39.21 (13.19)	43.54 (11.85)	41.08 (13.61)	46.07 (10.58)	0.07
Years of education	16.64 (4.25) a	9.13 (5.23) b	10.73 (4.93) b	9.18 (4.65) b	< 0.01
WHOQoL					
Physical health	29.71 (3.51) a	26.88 (4.46) a	22.00 (4.75)	21.97 (5.18) b	< 0.01
Psychological health	24.57 (2.68) a	21.69 (3.97) a	17.39 (4.13) b	17.06 (4.55) b	< 0.01
Social relationship	12.86 (1.41) a	10.31 (2.59) b	9.18 (2.75) bc	8.28 (2.54) c	< 0.01
Environment	32.64 (3.18) a	27.96 (4.28) b	26.38 (4.51) b	25.36 (5.79) b	< 0.01
Total score	99.79 (8.96) a	87.46 (10.53) b	75.16 (13.04) c	72.16 (14.69) c	< 0.01
HAM-D	2.32 (2.55) a	2.95 (4.02) a	9.37 (6.61) b	11.59 (7.74) b	< 0.01
HAM-A	4.54 (6.02) a	7.96 (7.03) a	16.62 (12.06) b	17.60 (11.47) b	< 0.01
CTQ					
Sexual abuse	5.35 (1.10) a	5.67 (2.62) ab	8.68 (4.86) b	7.35 (4.78) ab	< 0.01
Physical abuse	6.29 (2.59) a	8.04 (4.56) ab	9.54 (4.66) b	10.02 (4.54) b	< 0.01
Emotional abuse	6.14 (1.24) a	9.42 (4.96) ab	12.22 (5.38) cb	13.22 (6.08) c	< 0.01
Emotional neglect	10.64 (6.84)	11.25 (6.93)	14.86 (7.26)	13.52 (5.80)	0.06
Physical neglect	8.25 (4.69) ab	7.63 (3.08) b	10.73 (4.46) a	9.92 (4.37) ab	0.02
BMI	24.73 (3.47) a	28.18 (6.05) ab	29.34 (6.63) b	26.49 (5.07) ab	0.01

Abbreviations: WHOQOL-bref: World Health Organization Quality of Life; HAM-D: 17-item Hamilton Depression Rating Scale; HAM-A: Hamilton Anxiety Rating Scale; CTQ Childhood Trauma Questionnaire; BMI: Body mass index.

*p-value obtained by ANOVA or Kruskall-Wallis test. The same letters for the same variable indicate that there are no differences among the groups and different letters for the same variable indicate that there are differences among the groups.

Discussion

The current study shows depressed female smokers to score higher on measures of depression and anxiety, and lower in the quality of life scores WHOQOL-BREF. TUD increases the risk of developing more severe depressive and anxiety symptoms, as well as have a slower clinical recovery (JAMAL al., 2012), which may be modulated by genetic susceptibilities, including variations in the brain derived neurotrophic factor.

In addition, depressed, versus non-depressed, female smokers and never-smokers reported more childhood trauma, including sexual abuse, emotional abuse and physical abuse. Women with a history of moderate to severe childhood trauma, have a heightened risk of developing mood and substance use disorders (BLALOCK et al., 2013). Individuals who have experienced abuse or neglect in childhood are more likely to be diagnosed with MDD or anxiety in adulthood, in association with alterations in HPA axis activity. Individuals who have experienced early life stress have an earlier onset cigarette use, smoke more heavily and are more nicotine dependent.

Irrespective of TUD, patients with mood disorders had a significantly stronger family history of BD. Mood disorders are highly familial independent of whether the parent's condition is unipolar or bipolar disorders (OQUENDO et al., 2013).

This study has a number of limitations. Firstly, sample sizes lead to small numbers. Secondly, the age of our sample was 18-65 years old and therefore results cannot be generalized to older or younger populations.

In conclusion, women showing comorbid TUD and depression in clinical practice are common. Future research should target treatments in depressed female smokers that reduce inflammatory biomarkers, and thereby neuroregulatory kynurenines and glutamatergic activity.

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