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Impact of Interventions used to Treat Addictive Disorders on Food Addiction and Depression in Individuals with Obesity

Trina Aguirre PhD., RN[1], Rebecca Bowman DNP., RN[3], Leeza Struwe PhD., RN[2], Ann Koehler MS[1], Erica Schulte MS., PhDc[4], Jeffrey Holloway MD[3], Jason LaTowsky MD[3], Martha Stricker MBA., BSN., RN., CMPE[3], Kayla Pierce BSN., RN[1] and Molly Bloodgood AS., MS., MBS., BSN[1]

[1]*University of Nebraska Medical Center, College of Nursing - West Nebraska Division.*

[2]*University of Nebraska Medical Center, College of Nursing - Niedfelt Nursing Research Center.*

[3]*Regional West Physicians Clinic, Medical Plaza North.*

[4]*University of Michigan, Department of Psychology.*

***Correspondence:**
Trina Aguirre, PhD, RN, University of Nebraska Medical Center, College of Nursing - West Nebraska Division, NE, 69361-1815, USA, Tel: (308) 632-0429; Fax: (308) 632-0415; Email: taguirre@unmc.edu.

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ABSTRACT

Objectives: *Empirical evidence is growing that addictive-like tendencies toward foods may contribute to obesity. This pilot study evaluated interventions used to treat addictive disorders for the treatment of obesity in individuals with and without food addiction (FA). FA and depression were common in the study population at baseline, with greater prevalence and severity of depression in those with FA. This secondary analysis evaluated whether prevalence and/or severity of FA and depression changed with intervention.*

Methods: *Participants within each obesity phenotype (FA+, FA-) were randomly assigned to treatment groups [motivational interviewing, pharmacotherapy (naltrexone-bupropion), motivational interviewing with pharmacotherapy, information control]. Interventions were delivered following data collection at baseline, 1, 2, 3, and 4 weeks and 2, 3, 4, 5, and 6 months. FA and depression were assessed at baseline and 6 months using the Yale Food Addiction Scale and Patient Health Questionnaire-9, respectively.*

Results: *Prevalence and severity of FA declined between baseline and 6 months ($P < .001$). The decline in symptoms was greater among those who were FA+ than among those who were FA- ($P < .001$), reflecting that those who were FA+ had higher symptom totals at baseline. Depression scores and severity also declined between baseline and 6 months in both obesity phenotypes ($P < .001$).*

Conclusion: *Both FA and depression were common in this study population and may contribute to obesity and/or complicate its treatment. That interventions used to treat addictive disorders lessened the prevalence and severity of both FA and depression is promising for the treatment of obesity.*

Keywords

Obesity, Food addiction, Depression, Motivational interviewing, Naltrexone-bupropion.

Introduction

Obesity is a major health issue and is associated with increased risk of comorbidities and higher medical costs. Understanding the complexities of obesity is critical for developing effective treatments. Exploring eating behavior from an addiction perspective is an emerging field, though the term "food addiction" (FA) has been used since the 19th century [1]. Empirical evidence is growing that addictive-like tendencies toward foods (particularly highly processed foods) may contribute to obesity [2,3] and there is increasing interest in the implications of FA for treating obesity [4].

If addiction-like processes contribute to obesity in some individuals, then interventions used to treat addictive disorders may be effective in treating obesity in those with FA. Therefore, we conducted a pilot study to evaluate four such interventions, motivational interviewing (MI), pharmacotherapy (P), motivational interviewing with pharmacotherapy (MI+P), and an information control (IC) (diet and physical activity instruction) in individuals of both obesity phenotypes (FA+, FA-). Our goal is to develop effective obesity treatments for each phenotype. As part of this study, participants completed a set of baseline screening questionnaires, including the Yale Food Addiction Scale (YFAS) 2.0 [5], a validated and psychometrically sound instrument that adapts the 11 DSM-5 diagnostic indicators of substance use disorders to the consumption of highly processed foods (used to assess FA), and the Patient Health Questionnaire-9 (PHQ-9) [6] (used to assess depression).

Analysis of baseline responses revealed that 37% of individuals screened were FA+, 82% of participants experienced depression, and prevalence and severity of depression was greater in those who were FA+ [7]. The high incidence of depression suggests that depression may contribute to obesity and/or complicate its treatment. To further explore these relationships in both phenotypes, we re-administered the YFAS 2.0 and PHQ-9 instruments at participants' final appointment to evaluate whether there were changes in the prevalence and/or severity of FA and depression over the 6-month intervention period. We report these findings here.

Methods

This study was conducted in accordance with IRB protocol 763-16-FB. Potential participants were informed about the study and those choosing to participate were consented.

Participants

We recruited 83 participants from adults (age 19-65 years) with obesity referred by providers at the Regional West Physicians Clinic (RWPC) in Scottsbluff, Nebraska and through snowballing. Most were Caucasian (71%, Hispanics 28%, black 1%) women (89%, men 11%) [7].

Interventions

Participants within each obesity phenotype (FA+, FA-) were randomly assigned to treatment groups. Interventions were delivered following data collection at baseline, 1, 2, 3, and 4 weeks and 2, 3, 4, 5, and 6 months.

MI Intervention: MI, an evidence-based client-centered approach for behavioral change, was developed and is still used to treat addictions [8,4]. Our intervention focused on educating/supporting individuals in reducing their intake of highly processed foods and increasing their intake of whole or minimally processed foods. A written MI algorithm was used to ensure fidelity.

Pharmacotherapy Intervention: Sustained release naltrexone-bupropion (Contrave®, Nalpropion Pharmaceuticals, Inc., La Jolla, CA) was used because these drugs have been used to treat addictions (naltrexone – alcohol and opioid addictions, bupropion – smoking cessation) [9]. Naltrexone-bupropion produces weight loss by reducing appetite/cravings and is more effective in combination than either drug in monotherapy [10].

IC Condition: Participants in this control group received information about improving their diet and physical activity. All intervention groups received this same information during their baseline visit.

Data analysis

Analyses only included participants with YFAS 2.0 and PHQ-9 data at both baseline and 6 months (n = 40). Participants' FA phenotype was defined by their status at baseline. Differences were evaluated using independent and paired t-tests, ANOVAs, and Bonferroni multiple comparisons ($\alpha = 0.05$). Analyses were performed using IBM® SPSS® Statistics (Version 25) software.

Results

Food Addiction (FA)

The number of participants who were FA+ and the severity of FA declined between baseline and 6 months ($P < .001$). At baseline 43% (n = 17) were FA+ (2 mildly, 2 moderately, 13 severely), whereas at 6 months 5% (n = 2) were FA+ (1 mildly, 1 severely).

Mean number of FA symptoms declined between baseline and 6 months. The decline was greater among those who were FA+ (8.24 ± 3.13 to 1.53 ± 2.43) than among those who were FA- (2.00 ± 1.60 to 1.26 ± 2.12) ($P < .001$), reflecting that those who were FA+ had higher symptom totals at baseline.

The change in total number of symptoms between baseline and 6 months differed among FA phenotype-treatment groups ($P < .001$). The change was greater for those in the FA+ IC, P, and P+MI treatment groups than for those in all FA- treatment groups ($P < .001$ to .030) except the FA+ and FA- P groups ($P = .060$). Change in total symptoms did not differ between the FA+ MI group and any other FA phenotype-treatment group ($P = .079$ to 1.000).

Depression

Overall, PHQ-9 scores declined between baseline (11.58 ± 6.47) and 6 months (4.35 ± 3.85) ($P < .001$). The same pattern was observed among those who were FA+ (15.71 ± 7.02 to 4.82 ± 4.57, n = 17) and FA- (8.52 ± 3.94 to 4.00 ± 3.28, n = 23) ($P < .001$). Severity of depression also declined between baseline (6 none/minimal, 10 mild, 13 moderate, 5 moderately severe, 6 severe) and 6 months (24 none/minimal, 11 mild, 5 moderate) ($P < .001$).

The change in PHQ-9 scores differed among FA phenotype-treatment groups ($P = .004$) and was greater in the FA+ IC group than in all FA- treatment groups ($P = 0.002$ to $P = 0.010$) except the P treatment group ($P = 0.064$), largely because the FA+ IC group had higher baseline PHQ-9 scores.

Discussion

There is growing interest in identifying subtypes of obesity [11,12] and tailoring treatments for those with different vulnerabilities [4,13,14]. Though presently not a clinical diagnosis, the FA construct identifies distinctive obesity phenotypes [14,7]. Previous analyses from this pilot study revealed that those who are FA+ may require more intensive intervention to achieve biometric results [15] and that prevalence/severity of depression was greater in those who were FA+ [7]. These secondary analyses demonstrated that prevalence and/or severity of FA and depression declined with intervention, particularly in those who were FA+ at baseline. Lessening FA and depression may improve the success of efforts to address obesity.

Conclusion

Both FA and depression were common in this study population and both conditions may contribute to obesity and/or complicate its treatment. That interventions used to treat addictive disorders lessened the prevalence and severity of both FA and depression is promising for the treatment of obesity and will be explored further in a fully powered study.

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