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A comparative analysis of Type 2 diabetes and binge eating disorder in a bariatric sample

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ABSTRACT

An emerging literature has illuminated an important link between Type 2 diabetes mellitus (DM) and binge eating disorder (BED) within obese cohorts. However, prior work has not examined this relationship specifically in a weight loss surgery (WLS) sample or fully explored potential psychosocial factors associated with this co-occurrence. Therefore, the present investigation sought to identify socio-demographic (i.e. age, education, BMI, ethnicity, gender, age of obesity onset) and psychological (i.e. depressive symptoms, hedonic hunger/food locus of control beliefs, severity of binge eating-related cognitions) correlates of the co-occurrence of Type 2 DM and BED among bariatric surgery candidates. An archival sample of 488 patients seeking surgical treatment for clinical obesity completed a standard battery of pre-operative psychosocial measures. The presence of BED was evaluated using a semi-structured clinical interview based on the DSM-IV TR (APA, 2000) and was further corroborated by responses on the *Questionnaire on Eating and Weight Patterns-Revised* (*QEWP-R*; Spitzer, Yanovski, & Marcus, 1993). Results indicated that 8.2% of the sample was classified as having both Type 2 DM and BED concurrently. A multivariate logistic regression model revealed that in addition to other psychological (e.g., binge eating-related cognitions, hedonic hunger) and demographic variables (i.e. male gender), African American ethnicity (OR = 3.3: 1.41–7.73) was a particularly robust indicator of comorbid status. Findings support and extend previous health disparity research urging greater attention to the needs of traditionally underserved, at-risk populations seeking treatment for obesity complicated by dysregulated eating and metabolism. Additionally, these preliminary results underscore the relevance of considering the potential benefits of providing quality comprehensive pre- and post-operative psychological care among bariatric patients towards optimizing both short- and long-term health and well-being.

1. Introduction

Type 2 diabetes mellitus (DM) continues to warrant increased priority on the national public health agenda. According to recent statistics an estimated 25 million Americans are currently affected by the disease with more than a third being undiagnosed (CDC, 2011). Among the serious medical correlates associated with Type 2 DM include excess adiposity in the form of obesity in conjunction with other adverse health indicators reflecting the metabolic syndrome (Roehrig, Masheb, White, & Grilo, 2009). What is more the disease remains the 7th leading cause of death in the US and was attributed to almost 4 million excess deaths among adults worldwide in 2010 (Roglic & Unwin, 2010). The quality of life for individuals with Type 2 DM may be further complicated by an increased risk for stroke and heart disease, kidney failure, blindness, nerve damage, periodontal disease, and limb amputation (CDC, 2011). Compounding the vast psychosocial toll of diabetes are its considerable economic costs; total direct and indirect healthcare expenditures for the treatment of and disability resulting from diabetes in 2007 were estimated to be $174 billion (CDC, 2011). Perhaps most startling however is evidence suggesting that a projected 35% of US adults aged 20 and older is currently living with subclinical prediabetes (CDC, 2011).

Mobilized by these staggering trends, public health scientists have given increasing attention to identifying modifiable lifestyle factors that co-occur with (and may give rise to) the metabolic abnormalities that characterize Type 2 DM. Investigations centering on irregular eating patterns indicative of binge eating and its clinically-significant counterpart of binge eating disorder (BED) constitute the bulk of research in this emerging area. BED is exemplified by recurring episodes of eating an objectively large quantity of food within a 2-hour time period accompanied by the subjective experience of having lost control of food intake (APA, 2000); compensatory behaviors that are the hallmark of bulimia nervosa are not present (APA, 2000). BED is estimated to affect 2% of the general population

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(Spitzer et al., 1992) with higher rates found among obese treatment-seeking samples (Spitzer et al., 1993) including between 4.2% and 47% of weight loss surgery (WLS) candidates (Adami, Bandolfo, Bauer, & Scopinaro, 1995; Allison et al., 2006).

Remarkably, population-based estimates of the co-prevalence of Type 2 DM and BED from large nationally-representative samples remain to be documented. However, its co-occurrence was shown to be widely variable ranging from 2.5% (Mannucci et al., 2002) to almost 26% (Crow, Kendall, Praus, & Thuras, 2001) from data derived chiefly from clinic-based samples in the U.S. (Crow et al., 2001) and abroad (Herpertz et al., 2000; Mannucci et al., 2002; Papelbaum et al., 2005). Subclinical levels of abnormal binge eating patterns among individuals with Type 2 DM have also been cited as occurring between 14% (Kenardy, Mensch, Bowen, & Pearson, 1994) to as high as 40% (Meneghini, Spadola, & Florez, 2006) in clinical settings.

Notably, in the absence of epidemiological data from non-treatment seeking samples, recent estimates of the co-occurrence of Type 2 DM and BED have emerged from the large-scale multi-site Look AHEAD behavioral weight loss trial (Gorin et al., 2008). Approximately 2.6% of the more than 5000 participants with Type 2 DM met criteria for BED based on self-report (a prevalence of 1.4% assessed via structured clinical interview was observed in a subsample of 845 participants: Allison et al., 2007). However, a sizeable 7.5% of the original sample endorsed having significant problems with binge eating (Gorin et al., 2008).

A growing body of research has compared whether individuals characterized by both disorders are meaningfully distinguished from relevant comparison groups on socio-demographic indices and on measures assessing psychological and metabolic functioning. Relative to groups affected by Type 2 DM in the absence of BED, those with concurrent diagnoses endorse greater difficulties with hunger and disinhibited eating (Crow et al., 2001), have higher rates of body image disturbance (Allison et al., 2007; Herpertz et al., 2000) and general psychopathology (Herpertz et al., 2000), elevated depressive symptoms (Wing, Marcus, Epstein, Blair, & Burton, 1989), higher rates of anxiety disorders (Papelbaum et al., 2005), and greater reported impairments to quality of life (Crow et al., 2001). Whereas indicators of glycemic control (e.g., HbA1c) have typically been comparable (Allison et al., 2007; Crow et al., 2001; Gorin et al., 2008; Herpertz et al., 2000; Kenardy et al., 2001; Wing et al., 1989; please see Meneghini et al., 2006 for an exception), age (Allison et al., 2007; Kenardy et al., 2001; Meneghini et al., 2006), BMI (Allison et al., 2007; Crow et al., 2001; Meneghini et al., 2006), and age of obesity onset (Allison et al., 2007) have significantly differentiated Type 2 DM groups with and without BED; comorbid groups generally tend to be younger, heavier, and to have a longer history of weight problems than groups affected by Type 2 DM alone.

While the aforementioned evidence generated from between-group comparisons certainly provides an important contribution, scientists are just beginning to explore the socio-demographic and psychological correlates most strongly associated with the co-occurrence of Type 2 DM and BED in obese cohorts when several possible indicators are considered concurrently. Indeed, an increased risk of co-prevalent diagnoses was associated with a higher lifetime BMI and younger age among participants in the Look AHEAD trial (Allison et al., 2007). Race, sex and current BMI were not observed to confer increased risk of this comorbid status (Allison et al., 2007). In contrast, African American ethnicity was independently linked to a 6-fold higher odds of having both Type 2 DM and BED relative to European American ethnic group status in another pilot sample (Meneghini et al., 2006). It should be noted that analyses reported from the Look AHEAD trial both collapsed across 4 regional sites and also combined participants holding a BED diagnosis with those diagnosed with night eating syndrome (NES: Allison et al., 2007). Consequently, this approach may have obscured detecting meaningful associations that could vary by geographic region and/or specific eating pathology.

Despite this promising line of research noteworthy gaps remain. For instance, to our knowledge no study to date has reported socio-demographic and psychological factors among a co-occurring diagnostic group in comparison to a range of applicable obese participant controls (i.e. non-Type 2 DM/BED group, BED-only group, Type 2 DM-only group). Further, it is unclear what demographic and psychosocial parameters are most robustly associated with this comorbid status while considering several pertinent variables simultaneously. These underdeveloped domains underscore the need to both replicate (e.g., ethnicity, gender, age of obesity onset, depressive symptoms, problems with binge eating) and expand [e.g., inclusion of a modifiable psychological variable reflecting a persistent preoccupation with food and its reward properties in the absence of physiological hunger (i.e. hedonic hunger or food locus of control: Lowe & Butryn, 2007)] the possible set of associated indicators of this clinical co-occurrence. The results of such preliminary investigations may ultimately have direct clinical implications towards helping to inform targeted health promotion efforts along the entire Type 2 DM prevention continuum (e.g., early identification/screening, treatment planning, disease burden and disability reduction, etc.). Findings may also contribute to better articulating what person factors/individual differences best optimize treatment matching and its long-term effectiveness (e.g., weight loss, glycemic control, relapse prevention, etc.).

For the present study, a specialized population of obese individuals seeking WLS was considered a particularly unique and suitable group in which to further examine this co-occurrence for a number of reasons. First, pre-operative candidates frequently present with a higher percentage of clinical obesity, related medical comorbidities such as Type 2 DM, and significant rates of binge eating pathology (Kalarchian, Wilson, Brolin, & Bradley, 1998) in comparison to non-surgical weight-loss seeking samples and the general public. In fact, recent data has supported the surgical treatment of obesity specifically as the therapy of choice for the improvement or resolution of Type 2 DM metabolic impairments among the clinically obese (Ferchak & Meneghini, 2004). Therefore, a significant proportion of WLS candidates are motivated to participate in this treatment option specifically as a means of either preventing and/or improving diabetic symptoms.

We also anticipated that targeting a sample of obese patients considering surgical alternatives for weight loss would enhance the diversity of our participant sample. This was expected mainly with respect to the potential for the greater representation of men, ethnic minorities, and persons who tend to prefer a medical (versus behavioral) approach to obesity management. These groups reflect segments of the larger populace of obese individuals who are most often underrepresented in more typical behavioral weight loss treatment settings. Finally, a WLS sample provides a superior control in cases where group differences in either dysfunctional eating or metabolism are often attributed to variation in weight or BMI.

Therefore, the primary objectives of the present exploratory investigation are to: 1) document the prevalence of the co-occurrence of Type 2 DM and BED specifically in a WLS-seeking sample; 2) to assess whether socio-demographic and psychological factors differentiate Type 2 DM-BED group status from relevant BMI-comparable comparison groups (i.e. BED-only, Type 2 DM-only, non-BED/Type 2 DM control); and 3) to evaluate what socio-demographic and psychological factors are most strongly and uniquely correlated with the co-occurrence of Type 2 DM and BED in this sample.

2. Material and methods

2.1. Participants

An archival sample of a consecutive series of 500 patients seeking surgical treatment of obesity at the Duke Weight Loss Surgery Center between 2002 and 2004 was studied. This initial participant sample