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ScienceDirect
Eating Behaviors 8 (2007) 59–64
EATING BEHAVIORS

Does binge eating disorder alter cortisol secretion in obese women?

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Received 31 July 2005; accepted 25 January 2006

Abstract

It is still poorly determined whether the presence of Binge Eating Disorder (BED) would alter cortisol secretion in obese patients. We aimed at investigating levels of salivary cortisol (SC) in patients with and without BED. Forty seven (47) obese women between 30 and 65 years old were sequentially selected to participate in the study. The diagnosis of BED was assessed according to the Structured Clinical Interview for DSM-IV. Binge Eating Scale (BES) was used to assess binge severity. A trend toward a negative correlation was observed between SC and body mass index in the whole sample ($p=0.06$). The presence of BED was not associated with increased levels of SC. In women without BED, SC levels correlated inversely with BMI ($p=0.01$). On the other hand, in women with BED, SC levels correlated significantly with BES ($p=0.01$). Although obesity is associated with decreased levels of cortisol, this relationship may be lost in patients with BED. In patients with BED, binge eating severity may be a more relevant regulator of cortisol secretion than obesity itself.

Keywords: Obesity; Binge eating disorder; Salivary cortisol; eating disorders

1. Introduction

Obesity is nowadays considered a worldwide epidemic. Characterized by an excess of body fat, obesity can be considered a behavioral disorder, determined mainly by an increase in food intake. Although much more information is available on the clinical complications of obesity (i.e., hypertension, dislipidemia, among others), psychopathological comorbidities are also of relevance (Fabricatore & Wadden, 2004). Binge Eating Disorder (BED) is a newly recognized entity characterized by uncontrolled consumption of large amounts of food in the absence on inappropriate compensatory methods, associated with significant distress related to binge-eating (Devlin, 1996). The prevalence of BED is mainly increased in obese patients, affecting from 30% to 70% of this population (de Zwaan, 2001). Obese patients with BED differ from obese patients without BED mainly by increased rates of psychopathology (Fontenelle et al., 2003).

Obesity is associated with important disruptions in the hypothalamus–pituitary–adrenal (HPA) axis. More specifically, several studies have already demonstrated an increase in cortisol secretion in animal models (Cunningham,

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doi:10.1016/j.eatbeh.2006.01.002

Calles-Escadon, Garrido, Car, & Bode, 1986; Naeser, 1972). The same results were also demonstrated in humans, although in a lesser degree (Bjorntorp & Rosmond, 2000). Morning serum levels of cortisol, however, are usually decreased in obese patients (Strain, Zumoff, Strain, Levin, & Fukushima, 1980). These results are probably due to an increase in cortisol clearance rates, demonstrated through increased levels of urinary cortisol (Marin et al., 1992; Strain et al., 1980). The impact of the alterations in eating behavior on the HPA axis of obese patients remains to be determined.

There are several methods that can be used in the evaluation of the HPA axis. However, almost all of them have important technical and methodological limitations. Single measurements of total or free active cortisol are not informative, because cortisol is secreted in a highly irregular manner, and an invasive sampling by itself might be a source of bias (Rosmond, Dallman, & Bjorntorp, 1998). Urinary free cortisol has two important limitations. First, there are several difficulties in collecting urine during 24 h, leading to a high incidence of false negative results. Second, it is not useful in evaluating specific periods of the day. Salivary cortisol has emerged as one of the most important tools in the evaluation of the HPA axis. It is a noninvasive method that can be performed at any time of the day and has a good correlation with free active cortisol in serum (Rosmond et al., 1998).

We hypothesized that obese patients with BED might present a more significant disruption in the HPA axis than obese patients without BED. Since the majority of binge eating episodes in obese patients occurs during daytime, it is reasonable to speculate that this would disrupt the cortisol circadian rhythm, leading to high levels during the night. In this study, our objective was to investigate nocturnal levels of salivary cortisol in patients with and without BED according to weight excess, fat distribution and severity of binge eating.

2. Methods

2.1. Participants

Forty seven (47) obese women between 30 and 65 years old were sequentially selected to participate in the study at the Obesity and Eating Disorders Group (GOTA). Patients were excluded if they were using any medication that could interfere with cortisol secretion and/or metabolism, or if they had any endocrine disease related to weight gain. All participants were carefully examined by an experienced endocrinologist (ROM or CS) and provided a detailed medical history at baseline evaluation. The protocol was approved by the Ethics Committee of the Institution. A written informed consent was obtained from each patient after the procedures involved in the study were fully explained.

2.2. Anthropometrical examination

All participants had the following anthropometrical data registered: body weight (kg), height (m), Body Mass Index (BMI), waist circumference and waist–hip ratio (WHR). BMI was calculated as weight in kilograms divided by the square of height in meters (kg/m^2). Waist circumference was determined at the midpoint between the lowest rib and the iliac crest. WHR was defined as the ratio of waist girth to the largest circumference of the hips, measured at the trochanter major.

2.3. Salivary cortisol measurements

A sampling device called Salivette (Sarstedt Inc., Rommelsdorf, Germany) was used to collect saliva. The Salivette consists of a small cotton swab inside a centrifugation tube. On a random day, the participants delivery a salivary cortisol sample at 23:00 h. Careful oral and written instructions were provided to avoid misunderstandings. The analytical technique in assaying salivary cortisol was RIA. To minimize effects of feeding on cortisol levels, all patients were given guidelines regarding the time and quantity of evening food consumption prior to collection of the evening salivary specimen.

2.4. Psychiatric evaluation

The presence of psychiatric disorders, including Binge Eating Disorder (BED), was assessed using the Brazilian version of the Structured Clinical Interview for DSM-IV [SCID] (First, Spitzer, Gibbom, & Williams, 1996). The severity of the binge eating was assessed according to the Brazilian version of the Binge Eating Scale (BES) (Freitas,