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Menstrual cycle irregularity in bulimia nervosa Associated factors and changes with treatment

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Abstract

Objectives: This study determined the clinical and nutritional variables associated with menstrual disturbance in women with bulimia nervosa (BN). **Methods:** Eighty-two women with DSM-IV BN underwent psychiatric, nutritional and menstrual related assessments prior to an outpatient treatment programme and at 12 months follow-up. **Results:** Forty-five percent reported a current irregular menstrual cycle. A high frequency of vomiting, low thyroxine concentrations and low dietary fat intake were independently associated with irregular menses at pretreatment. At 12 months follow-up, 30.5% reported irregular menstrual cycles. A greater difference between past maximum and minimum body weight, smoking and depression were associated with menstrual irregularity at 12 months follow-up. Of those with irregular menstrual cycles at pretreatment, 56.8% became regular at 12 months follow-up. **Conclusion:** Menstrual irregularity in BN is associated with indices of nutritional restriction that are not reflected by low body weight or energy intake. Depression, cigarette smoking and fluctuations in body weight may act as metabolic stresses that contribute to the perpetuation of menstrual disturbances.

Keywords: Bulimia nervosa; Menstruation; Oligomenorrhea; Nutritional status

Introduction

Disturbances in menstrual cycle function are commonly associated with eating disorder pathophysiology. Amenorrhea occurs almost universally in anorexia nervosa and is thought to be a consequence of malnutrition-induced impairments in gonadotropin (particularly luteinizing hormone (LH)) secretory patterns [1]. Despite maintenance of normal body weight, in bulimia nervosa (BN), amenorrhea may occur in 7–40% of patients [2–6]. The occurrence of irregular menstrual cycles (oligomenorrhea) appears to be more common. Studies have consistently found that oligomenorrhea occurs within the range of 37–64% of women with BN [3,7–10].

The exact etiology of menstrual dysfunction in BN is yet to be clarified. Biochemical studies have shown that menstrual disturbances in BN are associated with reduced oestradial [11], noradrenalin [12] and LH concentrations, and reduced LH pulse frequency [13,14]. Ultrasonograpghy has revealed abnormal ovarian morphology in BN with 76–100% of patients having polycycstic ovaries [10,15]. Polycycstic ovary syndrome is a common cause of oligomenorrhea in normal women and is associated with an insulin-induced elevation in circulating androgen concentrations [16]. Thus, it has been suggested that abnormalities in insulin secretion as a result of large fluctuations in food intake may be responsible for the very high prevalence of polycycstic ovary syndrome in BN [10].

Clinical variables that have been associated with menstrual disturbance in normal weight BN include a current weight that is 85% less than past high weight [12], a history of anorexia nervosa and a past weight loss to less than 92% of the ideal body weight [17].

The present analysis determined the association between clinical and nutritional variables and menstrual disturbance

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Table 1
Participant characteristics[a]

Variable	Statistic
N	82
Age (years)	26.2 ± 6.2
Height (m)	1.65 ± 0.06
Weight (kg)	62.5 ± 7.8
BMI (kg/cm^2)	23.0 ± 2.7
Current irregular menses	45.1% (37)
History of amenorrhea	46.3% (38)
Age of menarche (years)	13.0 ± 1.5
Weight minimum (kg)	51.9 ± 6.9
Weight maximum (kg)	69.5 ± 10.8
Weight max – min (kg)	17.6 ± 8.4
BN duration (months)	65.5 ± 64.7
Binge frequency in the last 2 weeks	10.2 ± 10.6
Vomit frequency in the last 2 weeks	11.7 ± 12.1
History of AN	20.7% (17)
Recency of AN (months)	18.5 ± 7.9
Current major depression	22.0% (17)
Current substance abuse/dependence	23.2% (19)
HDRS (weight and appetite items)	8.5 ± 4.5
GAFS	55.5 ± 6.4
Current smoker	25.6% (21)
Smoke pack years	5.4 ± 6.9

Abbreviations: BMI = Body Mass Index; AN = Anorexia Nervosa; HDRS = Hamilton Depression Rating Scale; GAFS = Global Assessment of Functioning Scale.
[a] Data shown are means ± S.D. or percentages (*N*).

in women presenting for treatment with normal weight BN. In addition, we investigated factors associated with the continuation of menstrual disturbance at 12 months follow-up.

Methods

Pretreatment assessment

Participants in this study were 82 women (aged 17–45 years) who were assessed consecutively prior to entry to an outpatient trial designed to explore the additive efficacy of exposure with response prevention to cognitive behavioural therapy for BN [18]. All participants met DSM-IV criteria for BN, purging type [19]. Exclusion criteria were current anorexia nervosa, a body mass index (BMI) less than 17 or greater than 30 kg/m^2 and current use of psychoactive medication. Recruitment was via media advertisements and referral from general practitioners and mental health workers. The study had received prior ethical approval and all participants provided written informed consent. A clinician-administered Structured Clinical Interview for DSM-III-R (SCID), Global Assessment of Functioning Scale [20] and a focused structured clinical interview designed to assess the status of core bulimic symptomatology in the prior fortnight. Questions reflected concepts from the Eating Disorder Examination [21] and assessed the frequency of objective binges, episodes of vomiting, laxative use and the frequency and intensity of body dissatisfaction and food restriction [18]. The interview included questions on current menstrual irregularity and oral contraceptive use [18]. Depressive symptomatology was assessed using the 17-item Hamilton Depression Rating Scale (HDRS), which was adjusted for the weight and appetite items [22]. Body weight and height were measured in a standardized manner (in light clothing, without shoes). From these measurements, BMI was calculated using height (cm)/weight (kg)^2.

Blood sampling

Blood was drawn from an antecubical vein for thyroid hormone analysis. Serum thyroxine (T4) was measured by RIA kits (Nichols Institute, CA). Free T4 was measured by RIA after equilibrium dialysis [23]. Serum thyroid-stimulating hormone (TSH) was measured by immunoradiometric assay (Allegro HS-TSH, Nichols Institute).

Dietary analysis

A subset of 30 participants prospectively recorded the amounts and descriptions of all food and drink consumed during the 14-day period prior to treatment. Each participant was individually trained on the diet record keeping procedure by a research assistant. The research assistant contacted each subject by telephone on the second, seventh and fourteenth days of recording to encourage adherence to the procedure and to address problems that may have arisen. The diets for each participant were analysed with a dietary analysis program [24]. For the present study, we used the summary measure corresponding to the amount consumed during normal eating episodes. The nutrient intake during binge/purge eating episodes was excluded because the proportion of nutrients retained after purging episodes is unknown.

Twelve months follow-up

All 82 women assessed at pretreatment completed the treatment programme. They were reassessed at 12 months following treatment cessation by a clinician using a modified version of the SCID, GAFS, HDRS and the interview assessing core bulimic symptomatology. Weight and height were measured as at pretreatment. Dietary intake and blood samples were not available for analysis at this time point.

Statistical anaylsis

All analyses were performed with version 3.0.2 of the "JMP" statistics package [25]. There were two main analytical goals: (1) to determine the prevalence of and factors associated with menstrual irregularity in BN; and (2) to determine the predictors of persistent menstrual irregularity 12 months after treatment. Data that were not normally