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Energy and macronutrient intake in bulimia nervosa

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Abstract

Energy deprivation and malnutrition are often thought to be key factors in the maintenance of bulimia nervosa (BN). Our review shows that it is unclear how much energy is actually available to BN patients' metabolism because the contribution of food consumed during binge eating is generally neglected. Also, there is little evidence for another key hypothesis that binge-eating episodes are triggered by carbohydrate craving. This study examined energy consumption and macronutrient composition of meals and binge-eating episodes in food diaries. Forty female BN patients, 40 female panic disorder (PD) patients, and 40 healthy women recorded their food intake while in their natural environment during two consecutive days. We did not find the expected evidence for chronic energy deprivation and malnutrition in BN patients. Also, there was no evidence that carbohydrate craving drives binge eating. The implications for models of BN and for treatments targeting eating behavior are discussed.

Keywords: Bulimia; Binge eating; Dietary restraint; Malnutrition; Self-monitoring; Panic disorder

1. Introduction

Energy deprivation and malnutrition due to abnormal nutrient composition of meals are often thought to be involved in maintaining bulimia nervosa (BN). Several theorists propose that excessive dieting can lead to energy deprivation with severe biological consequences which are assumed to be relevant for the etiology and maintenance of bulimia (Booth, Lewis, & Blair, 1990; Fairburn & Cooper, 1989; Orleans & Barnett, 1984). Indeed, observed meals consumed in the laboratory which were not labeled as binge-eating episodes were smaller than typical meals of normal people

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(Mitchell & Laine, 1985; Rosen, Leitenberg, Fondacaro, Gross, & Willmuth, 1985). Outside of the laboratory, BN patients report to be fasting between the binge-eating episodes (Pyle, Mitchell, & Eckert, 1981; Weiss & Ebert, 1983; Woell, Fichter, Pirke, & Wolfram, 1989). BN patients consume fewer calories than controls in regular meals and snacks (Davis, Freeman, & Garner, 1988) and on days when no binge-eating episodes occur, BN patients consume fewer calories than normal controls (Schweiger, Laessle, Fichter, & Pirke, 1988), but this was not always found (van der Ster Wallin, Norring, Lennernas, & Holmgren, 1995). A more direct link between energy deprivation and binge eating comes from a study where fewer calories were counted in the food diaries before the onset of a binge episode than controls consumed up to the same time of day (Davis et al., 1988), but this was not always found either (Lingswiler, Crowther, & Stephens, 1989). Whereas total energy consumption, including binge eating, did not differ between BN patients and healthy controls in one study (Gleaves, Williamson, & Barker, 1993), it was much higher in BN patients than in controls in another study (Gendall, Sullivan, Joyce, Carter, & Bulik, 1997), but, this may have been an overestimation of energy that was actually available for metabolism because the loss of calories due to purging was not taken into account. It is therefore necessary to examine the contribution binge-eating episodes make to the actual energy intake.

Estimates of calories consumed during binge eating from patient's memory recall are between 3500 and 5000 kcal (Johnson, Stuckey, Lewis, & Schwartz, 1982; Mitchell, Pyle, & Eckert, 1981). When patients were instructed to eat as much as possible in the laboratory, the consumption was in the same range of between 3300 and 4500 kcal (Hadigan, Kissileff, & Walsh, 1989; Hadigan, Walsh, Devlin, LaChaussee, & Kissileff, 1992; Kaye, Gwirtsman, George, Weiss, & Jimerson, 1986; Kaye et al., 1992; Mitchell & Laine, 1985; Walsh, Hadigan, Kissileff, & LaChaussée, 1992; Walsh, Kissileff, Cassidy, & Dantzic, 1989; Walsh, Kissileff, & Hadigan, 1989). However, this is much more than what was found in food protocols outside of the laboratory where binges contained between 1100 and 1500 kcal (Davis et al., 1988; Elmore & deCastro, 1991; Gendall et al., 1997; Gleaves et al., 1993; Rosen, Leitenberg, Fisher, & Khazam, 1986; Rossiter & Agras, 1990; Rossiter, Agras, & Losch, 1988). Aside from these discrepancies, none of the studies we reviewed estimated the energy that is actually retained after purging.

In addition to energy deprivation, chronic malnutrition has been proposed to be a maintaining factor of BN. The total consumption in BN patients (i.e., nonbinge meals plus binge-eating episodes) had a lower carbohydrate and protein content compared with healthy controls (Woell et al., 1989), but a higher proportion of protein was found in another study (Blouin et al., 1993) and in a laboratory study where BN patients consumed food items with less fat than the control group (Walsh, Kissileff, Cassidy, et al., 1989). Looking at meals from nonbinge days only, the proportion of protein was higher, while that of carbohydrates was lower, in BN patients compared to controls (Schweiger et al., 1988), which is a pattern also found in laboratory meals (Gwirtsman et al., 1989; Walsh, Kissileff, Cassidy, et al., 1989). In addition to the compensation for malnutrition, the craving for specific macronutrients contained in food consumed during bingeing was suggested as a driving force of binge eating because carbohydrates may have a mood-lifting effect (Wurtman, 1988). Because a number of patients stated in interviews that they consumed mostly carbohydrate-rich food when binge eating (Abraham & Beumont, 1982), "carbohydrate craving" has been frequently described as one of the key features of binge eating although there is little evidence supporting it. The relative contribution of carbohydrates to the energy consumed is not higher in food consumed during binge-eating episodes than in normal meals consumed by healthy people (Kaye et al., 1992;