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Aberrant Snacking Patterns and Eating Disorders in Patients With Obsessive Compulsive Disorder

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Background: Appetitive symptoms, particularly carbohydrate craving, have been shown to occur in patients whose conditions responded to treatment with drugs that enhance serotonin-mediated neurotransmission. This suggested that patients with obsessive compulsive disorder (OCD) who also frequently respond to serotonergic drugs also might have similar distributions of appetitive and eating patterns.

Method: A survey study of 170 OCD patients and 920 controls was conducted using a questionnaire that inquired about snacking behavior, including food preference, mood changes after eating, and previous diagnosis of eating disorders. The frequency responses in the two groups were tested for statistical significance.

Results: Significant differences were found between the OCD and control groups with respect to the reported incidence of eating disorders, snacking patterns, and mood response to food.

Conclusion: This finding of different snacking patterns in OCD mirrors that found in other disorders that have been shown to be responsive to serotonergic drugs. The high incidence of carbohydrate snacking among OCD patients compared with the control group provides additional evidence that brain serotonin may be involved in this disorder.

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An association between appetitive symptoms, particularly carbohydrate craving, and mood disturbances has been noted in such clinical states as carbohydrate-craving obesity,[1] seasonal affective disorder,[2] and the late luteal phase dysphoric disorder.[3] Since dietary carbohydrates, when eaten without protein, raise brain serotonin levels,[4] this association has been taken as evidence for an etiological role for serotonin in these conditions. Moreover, *d*-fenfluramine, which selectively enhances serotonin-mediated neurotransmission, has been shown to be effective in ameliorating both appetitive and affective symptoms associated with each of these conditions.[1-3]

Since drugs that enhance serotonergic neurotransmission by blocking serotonin's reuptake (clomipramine[5] and fluoxetine[6]) often relieve symptoms in obsessive compulsive disorder (OCD),[7] we wished to establish whether OCD, in some patients, also might be associated with alterations in appetite—particularly carbohydrate craving—and in eating behavior.

METHOD

A questionnaire of food-intake history[8] was completed anonymously and without supervision by 170 outpatients (75 males, 95 females) in the OCD clinic and research unit at Massachusetts General Hospital; subjects met DSM-III-R criteria for OCD and were told that they were participating in a survey regarding eating and snacking history. Their mean ± SD ages were 36.1 ± 11.3 years for females and 35.5 ± 13.2 years for males. Both populations were of similar body weight. Subjects, all medication free, were given the questionnaire when they initially presented for treatment. The control population consisted of 1064 individuals who were outpatients at a dermatology clinic. Of these, 920 patients (554 females, 39.7 ± 14.5 years; 366 males, 44.1 ± 18.6 years) completed the same questionnaire and were included in the analysis. The questionnaire asked about lifetime formal diagnoses of particular eating abnormalities (anorexia, bulimia, binge eating, fear of weight gain or obesity); current snacking behavior

Table 1. Questionnaire Responses for 170 OCD Outpatients and 920 Controls

Response	Females			Males		
	OCD (N = 95) % Yes	Controls (N = 554) % Yes	p Value	OCD (N = 75) % Yes	Controls (N = 366) % Yes	p Value
Diagnosis of anorexia nervosa or bulimia nervosa	10	2	.0001	5	0	.0001
History of binge eating	44	29	.005	52	28	.0001
Self-induced vomiting to avoid weight gain	11	4	.017	4	0	.017
Fear of weight gain	55	47	.170	29	16	.010
Snacking when not hungry	54	50	.292	52	29	.0001
Daily snacking	58	51	.499	62	45	.002
Missed period when not pregnant	33	21	.017	N/A	N/A	N/A
Food preference change before period	64	53	.070	N/A	N/A	N/A
Winter change in food preference	45	45	.977	18	26	.168
Feeling restless, bored, tired, cranky, tense, or distracted before snack	84	56	.0001	71	38	.0001
Feeling better after snack	75	61	.020	80	74	.692

(snacking when not hungry, time of snacking, preferred snack foods); as well as changes in food preference on a seasonal basis or in conjunction with menstrual cycles. While none of the patients in the study had a primary diagnosis of either depression or anxiety, the possibility that these states may have coexisted was not ruled out. The controls were not screened to exclude OCD, other psychiatric diagnoses, or those who were receiving medications. Information also was obtained about mood states before and after eating or snacking.

Frequency distributions among the OCD and control patients were tested for independence using chi-square with Yates' correction for continuity except in cases where the expected frequency of one or more cells of the 2×2 table was less than five, in which case Fisher's exact test was utilized. An alpha level of .01 was used for statistical significance. Data are presented as means, with standard deviations as the measure of dispersion.

RESULTS

A number of statistically significant differences were noted between the two groups: The patients with OCD—both males (5%) and females (10%)—reported higher frequency of a previous diagnosis of anorexia nervosa or bulimia nervosa than control subjects (Table 1: control males 0%, control females 2%, $p < .0001$). There also was higher frequency of binge eating among the OCD group, with 44% of the females ($p = .005$) and 52% of the males ($p < .0001$) admitting to this eating pattern (versus 29% and 28%, respectively, in the control groups). More females—both in the OCD and in the control groups (55% and 47%, respectively)—reported a current fear of gaining weight or becoming fat than did the males (29% and 16%); the OCD-versus-control difference was statistically significant for males ($p < .010$). A gender difference also was evident in response to the question, "Do you tend to snack when you are not hungry?"; positive responses were more common among OCD males (52%) than among control males (29%, $p < .0001$) but not among OCD females (54%) in comparison with control females (50%).

More OCD males (62%) than control males (45%, $p < .002$) described current frequent daily snacking; but 58% of the OCD females and 51% of control females snacked each day, a difference that was not statistically significant. Male controls were older on average than male OCD patients, but ranges were the same. Since the variables that were analyzed were not known to be age related, adjusting for age was not considered necessary. OCD males (80%) and OCD females (75%) who snacked daily reported improved mood state after snacking; of these, 67% of the males and 89% of the females elected to snack on carbohydrates. A majority of the control males who chose to snack daily reported feeling better after doing so (74%), but a smaller proportion (37%) than in the OCD population ($p < .01$) chose carbohydrates. Among control females, 61% felt better after daily snacking, and 65% of those chose carbohydrates. We considered the possibility that those individuals with comorbid eating disorders might bias the data regarding eating patterns and snacking. We removed them; and, on reanalyzing the data, the results were essentially unchanged.

A negative mood state, described as "feeling restless, bored, tired, cranky, tense, or distracted" before snacking was seen more frequently among OCD females (84%) than in the controls (56%, $p < .0001$) and also among more OCD males (71%) than the controls (38%, $p < .0001$).

More females with OCD (33%) reported having "missed a period when not pregnant" than control subjects (21%); this difference approached significance ($p < .017$). Responding females with OCD (64%) and controls (53%) described changes in food preference before menstruation ($p = .070$). Of both OCD and control females, 45% reported winter changes in food preference ($p = 1.00$).

DISCUSSION

These data show that patients with OCD are more likely to report differences in eating patterns, including carbohydrate snacking to improve mood, than control subjects with dermatologic disorders. OCD patients also reported an increased frequency of prior eating disorders, including anorexia nervosa, bulimia, and binge eating. Patients with OCD also were more likely than control subjects to snack daily, and the majority of these individuals, 80% of the males and 75% of the females, reported a more positive mood state thereafter, with 89% of the females and 67% of the males choosing carbohydrate-rich snack foods. Patients with OCD also were more likely than control subjects to describe themselves as snacking when not hungry.

The tendency of patients with OCD to snack more frequently, even when not hungry, and to experience improvements in mood states after carbohydrate snacking is similar to that of other patient populations we have studied, including those with carbohydrate-craving obesity,[1] seasonal affective disorder,[2] and the late luteal phase dysphoric disorder.[3] The relationships between the ingestion of carbohydrate-rich, protein-poor snacks and the enhancement of brain serotonin synthesis via insulin-mediated changes in plasma-amino-acid patterns has been described extensively elsewhere.[9] It was suggested that this enhancement causes a short-term improvement in mood among such patients and that patients ultimately develop patterns of excessive carbohydrate snacking because they recognize this relationship.[10] Our present findings thus provide further evidence for a role for brain serotonin in the etiology of OCD in at least some patients.

There were statistically significant differences in the snacking patterns between OCD patients and controls for males but not for females. This raises the question that these gender differences in eating behavior might reflect gender differences in serotonin regulation.

Atypical depression, which frequently includes overeating and carbohydrate craving, has been shown to be responsive to drugs that increase serotonin-mediated neurotransmission.[11] The observed therapeutic responses of patients with carbohydrate-craving obesity,[1] seasonal affective disorder,[2] and premenstrual syndrome[3] to *d*-fenfluramine are consistent with the known roles of serotonergic neurons in the control of appetite and mood. Fenfluramine has been shown to be useful in the augmentation of fluoxetine, fluvoxamine, and clomipramine in patients with OCD.[12] Patients with OCD, particularly those also exhibiting carbohydrate craving, might represent another clinical population that may experience therapeutic benefit from drugs such as *d*-fenfluramine. Moreover, OCD patients with carbohydrate craving might be especially responsive to other serotonergic drugs, a hypothesis we plan to test in the near future.

Drug names: clomipramine (Anafranil), fenfluramine (Pondimin), fluoxetine (Prozac).

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