

## Prevalence of the Night Eating Syndrome in a Psychiatric Population

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**Objective:** This study assessed the prevalence of night eating syndrome and its comorbid psychopathology in a psychiatric population.

**Method:** The Night Eating Questionnaire was administered to 399 patients in two psychiatric outpatient clinics. Those scoring above 20 on the questionnaire (N=205) were assessed for night eating syndrome with a semistructured telephone interview. Chart reviews of all participants were performed to determine their psychiatric diagnoses and medications.

**Results:** Forty-nine participants (12.3%) met criteria for night eating syndrome. Greater rates of substance use disorders were found among patients diagnosed with night eating syndrome than among those without the syndrome. Obese patients were more likely than nonobese patients to manifest night eating syndrome.

**Conclusions:** Night eating syndrome is prevalent among psychiatric clinic outpatients and is likely to co-occur with substance use disorders and obesity.

(*Am J Psychiatry* 2006; 163:156–158)

The night eating syndrome is a pattern of delayed circadian intake of food, characterized by two main features: evening hyperphagia (eating more than one-third of total daily calories after the evening meal) and nocturnal awakening with ingestion of food (1, 2).

Night eating syndrome was first noted among obese patients, but it also occurs among nonobese persons (3). Its prevalence has been estimated at 1.5% in the general population (4) and 8.9% in an obesity clinic (5).

The prevalence of night eating syndrome in a population seeking treatment for psychiatric disorders is of interest because night eating syndrome is frequently associated with life stress and depression (1). The purpose of this study was to identify the point prevalence of night eating syndrome and assess its comorbid psychopathology in a psychiatric population.

### Method

Subjects were recruited from psychiatric outpatient clinics at the University of Pennsylvania (N=323) and the University of Minnesota (N=118). Physician approval to participate indicated that participants could comprehend study materials and could be approached by study staff at their next clinic appointment. Of 441 approached, 42 refused participation, and 399 were enrolled in the study.

The Night Eating Questionnaire (3) was used as a screening tool to assess hunger and craving patterns, percentage of calories ingested after the evening meal, insomnia and awakenings, nocturnal food cravings and ingestions, and mood. The Night Eating Syndrome History and Inventory (unpublished semistructured interview) was used to make a diagnosis of night eating syndrome.

The study protocol was approved by the institutional review boards of both universities. Participants provided informed consent and completed the Night Eating Questionnaire. Those scor-

ing  $\geq 20$  (out of a possible 56 points) were contacted for further assessment with the Night Eating Syndrome History and Inventory. Clinic space and time constraints prohibited patient interviews at their clinic appointments. Participants were diagnosed with night eating syndrome if one of two criteria were met: 1) evening hyperphagia (more than one-third of total calories consumed after the evening meal) or 2) nocturnal awakenings with ingestions of food occurring three or more times per week. Chart reviews determined current psychiatric diagnoses and medications.

### Results

No significant differences were found between the Pennsylvania and Minnesota subject groups in terms of age (combined mean=40.8 years, SD=12.7), body mass index (combined mean=29.1 kg/m<sup>2</sup>, SD=7.5), gender (women constituted 61.4% of the total group), or Night Eating Questionnaire score (combined mean=21.1, SD=10.0). Ethnicity of the Pennsylvania group (Caucasian: 71%, African American: 27%, other: 2%) and the Minnesota group (Caucasian: 90%, African American: 6%, other: 4%) differed significantly ( $\chi^2=18.34$ , df=2,  $p<0.001$ ). The rate of night eating syndrome diagnosis based on ethnicity was not significantly different ( $\chi^2=2.6$ , df=2,  $p=0.28$ ); the samples were combined for further analyses.

Two hundred five participants (51.4%) scored  $\geq 20$  on the Night Eating Questionnaire. Upon interview, 49 were diagnosed as having night eating syndrome, 28 with sub-threshold night eating syndrome, and 44 as not having the syndrome; the remaining 84 participants who scored  $\geq 20$  on the Night Eating Questionnaire could not be contacted despite several attempts. No significant differences in baseline characteristics were found between those who

were interviewed and those who could not be contacted. Participants unable to be contacted for interview were excluded from further analyses; those with subthreshold night eating syndrome were considered as not having the syndrome in further analyses.

The point prevalence of night eating syndrome, based on the total group of 399 participants, was 12.3%. Excluding the 84 patients unable to be contacted, the point prevalence was 15.6%. The positive predictive value of the Night Eating Questionnaire score with a cutoff of 20 was 40%. A cutoff score of 25 yielded a positive predictive value of 52%; a cutoff of 30 yielded a positive predictive value of 68%.

Analyses of variance found a significant effect of night eating syndrome diagnosis on body mass index (subjects with night eating syndrome: mean=33.1 kg/m<sup>2</sup> [SD=9.2]; subjects without night eating syndrome: mean=27.7 kg/m<sup>2</sup> [SD=6.6];  $F=24.0$ ,  $df=1$ , 300,  $p<0.001$ ) and Night Eating Questionnaire score (mean=34.18 [SD=6.8] and 16.4 [SD=7.3], respectively;  $F=249.4$ ,  $df=1$ , 313,  $p<0.001$ ). Age and ethnicity did not differ significantly between groups.

The proportion of participants who met criteria for current and remitted substance use disorder was significantly greater among subjects with night eating syndrome than among subjects without night eating syndrome (Table 1). No other diagnoses (i.e., unipolar or bipolar mood disorders, anxiety disorders, psychotic disorders, or personality disorders) significantly differed between groups.

A greater proportion of patients with night eating syndrome were prescribed atypical antipsychotic medications than those without the syndrome (38.8% versus 30.8%, respectively;  $\chi^2=6.24$ ,  $df=2$ ,  $p=0.04$ ). No differences were found for nonatypical antipsychotics, selective serotonin reuptake inhibitors (SSRIs), non-SSRI antidepressants, benzodiazepines, nonbenzodiazapine anxiolytics, anticonvulsants, lithium, hypnotics, or stimulants. Analyses of variance found no effect of drug class, including atypical antipsychotics, on weight ( $p>0.05$ ).

Obese participants (body mass index  $\geq 30$  kg/m<sup>2</sup>; total  $N=104$ ) were 5.2 times (Wald=13.3,  $p<0.001$ ) more likely to meet criteria for night eating syndrome than normal weight participants (total  $N=105$ ); overweight participants (body mass index=25.0–29.9 kg/m<sup>2</sup>; total  $N=93$ ) were 2.5 times (Wald=3.5,  $p=0.06$ ) more likely to meet criteria for night eating syndrome than normal-weight participants.

## Discussion

This study assessed night eating syndrome among a particularly vulnerable group: psychiatric patients. Within this group: 12.3% met criteria for night eating syndrome, exceeding the prevalence of night eating syndrome in an obesity clinic (5) and greatly exceeding the prevalence of such well-known eating disorders as anorexia nervosa (0.3%) and bulimia nervosa (1.0%) (6). Lifetime substance use disorder was more likely to occur among patients with

**TABLE 1. Substance Use Diagnoses Among Psychiatric Patients With or Without Night Eating Syndrome**

Substance Use Diagnosis	Patients With Night Eating Syndrome (N=49)		Patients Without Night Eating Syndrome (N=253) <sup>a</sup>		Analysis <sup>b</sup>	
	N	%	N	%	$\chi^2$ (df=1)	p
None	34	69.4	232	91.7		
Current	5	10.2	12	4.7	3.7	0.05
In remission	10	20.4	9	3.6	21.6	<0.001

<sup>a</sup> Chart reviews unavailable for 13 patients with no night eating syndrome diagnosis.

<sup>b</sup> Comparison with no substance use diagnosis.

night eating syndrome (30.6%) than among those without the syndrome (8.3%), a finding consistent with the previously reported relationship between bulimia nervosa and substance use disorders (7). Alcohol was the most commonly abused substance for patients both with night eating syndrome (46.7%) and without (66.7%).

Atypical antipsychotic agents (which included aripiprazole, olanzapine, quetiapine, risperidone, and ziprasidone) were used more frequently by night eaters than by others. Among those prescribed atypical antipsychotics, there appeared to be no difference in the percentage using weight-promoting agents (night eating syndrome=78.9%, no night eating syndrome=81.0%). Prospective studies of medication use and night eating syndrome are needed.

Obesity was present in 57.1% of night eaters (an additional 28.6% were overweight), and the odds of night eating syndrome were fivefold higher for the obese versus the nonobese clinic attendees. Future studies should assess distress associated with night eating syndrome, especially that related to excess weight, in this population.

Mental health practitioners will probably encounter night eating syndrome in their practice and will need treatment options. A recent study has found significant improvements in key night eating syndrome symptoms, including nocturnal ingestion and evening hyperphagia, with sertraline (8).

In conclusion, night eating syndrome is a prevalent disorder among psychiatric outpatients and is associated with substance use, atypical antipsychotic use, and obesity. Treatment is available to manage this syndrome.

Presented in part at the annual meeting of the North American Association for the Study of Obesity, Las Vegas, Nov. 14–18, 2004. Received March 25, 2005; revision received July 11, 2005; accepted Aug. 18, 2005. From the Department of Psychiatry Weight and Eating Disorders Program, University of Pennsylvania; and the Department of Psychiatry, University of Minnesota, Minneapolis. Address correspondence and reprint requests to Dr. Lundgren, Department of Psychiatry Weight and Eating Disorders Program, University of Pennsylvania, 3535 Market St., Suite 3123, Philadelphia, PA 19104-3309; jlundgre@mail.med.upenn.edu (e-mail).

Sponsored in part by NIMH grant K-02 MH-65919 and grants from the National Institute of Diabetes and Digestive and Kidney Diseases (P30 DK-50456 and DK-56735-04).

The authors thank the faculty, residents, and staff of the University of Pennsylvania and University of Minnesota psychiatric clinics.

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