

The Topography of Binge Eating, Vomiting and Laxative Abuse

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Data on the frequency and time distribution of bulimic episodes were examined in three groups of patients: those who reported binge eating and vomiting, those who reported binge eating and laxative abuse, and those who reported binge eating and both vomiting and laxative abuse. The probability of binge eating increased during the afternoon and evening for all three groups. Those who did not use laxatives reported a high frequency of binge eating, whereas those who used laxatives exclusively usually did so very late in the day.

The DSM-III-R criteria for bulimia nervosa, in addition to requiring the practice of binge eating, also require the presence of some behavior designed to promote weight loss or prevent weight gain. Such behaviors can include strict dieting, fasting, and vigorous exercise to prevent weight gain. However, in clinical practice, most individuals who present for treatment with bulimia nervosa have a pattern of binge eating coupled with self-induced vomiting and/or laxative abuse as weight-control techniques.

Since Russell's first delineation of bulimia nervosa as a discreet and common disorder (Russell, 1979), several groups of investigators have attempted to study bulimic behaviors in detail. The results of these investigations indicate that what patients label binge-eating episodes can be highly variable. However, in general, individuals with bulimia nervosa consume large amounts of food when binge-eating, usually far more than could be considered a large meal (Crowther, Lingswiler, & Stephens, 1984; Davis, Freeman, & Garner, 1988; Johnson, & Larson, 1982; Kissileff, Walsh, Kral, & Cassiday, 1986; Mitchell & Laine, 1985; Mitchell, Pyle & Eckert, 1981; Rosen, Leitenburg, Fisher, & Khazam, 1986), and most tend to engage in bulimic behaviors late in the day, after returning home from work or school (Mitchell, Hatsukami, Eckert, &

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Pyle, 1985). Lacey and Gibson (1985) have reported that individuals who self-induce vomiting eat significantly more during eating binges yet weigh significantly less than those who use laxatives for weight control. However, to our knowledge, little has been reported concerning the topography of bulimic behaviors in those who abuse laxatives instead of vomiting, or in those who both abuse laxatives and self-induce vomit. Understandably, the topography of bulimic behaviors may help us to better understand the maintenance of these symptoms and to better devise structured behavioral interventions for them. We were interested in examining several questions in this study:

1. Do patients who binge eat and abuse laxatives binge eat less often than do individuals who binge eat and self-induce vomiting, as was suggested by Lacey & Gibson (1985)?
2. When during the day do individuals who abuse laxatives ingest them?
3. What is the pattern of bulimic behaviors among individuals who binge eat and both self-induce vomiting and abuse laxatives? Do they engage in these behaviors at similar or different times? Does the pattern of their bulimic symptoms during the day resemble that of patients who self-induce vomiting, of those who abuse laxatives, or is their pattern different from these other two groups?

METHODS

Data for this study were drawn from the research files of patients who had been evaluated in the Eating Disorders Clinic at the University of Minnesota over the last few years. To be included in the sample, the records had to indicate that the patient satisfied DSM-III-R criteria for bulimia nervosa and the additional frequency criteria of binge eating coupled with self-induced vomiting and/or laxative abuse at a minimum frequency of 3 times a week for the 6 months prior to study participation. Additional inclusion criteria included age between 18 to 40, female gender, and weight of at least 75% ideal body weight (Metropolitan Life Insurance Tables, 1959).

Patients who are scheduled to be evaluated in this clinic are mailed routinely a packet of information that includes self-monitoring forms. Prospective patients are asked to self-monitor their eating behavior prior to coming to evaluation, using the EBIII (Mitchell et al. 1985). For an individual to be included in the sample, self-monitoring data for a minimum of 3 days prior to evaluation were needed. The majority of subjects had self-monitoring data for at least a week. What constituted binge eating was not defined by the investigators but was left up to each patient.

The presence or absence of binge eating, vomiting, and laxative abuse episodes for several time periods during the course of the day (6–8 a.m., 8–10 a.m., 10–12 a.m., 12–2 p.m., 2–4 p.m., 4–6 p.m., 6–8 p.m., 8–10 p.m., 10–12 p.m., and 12–6 a.m.) was scored for each subject for each day of self-monitoring, and a composite picture of the probability of these bulimic behaviors for each subject during each time period was calculated. These were summed then across subjects, who were divided into three groups: individuals

who reported current binge-eating (B) and self-induced vomiting (V), B + V ($n = 41$); individuals who reported current binge-eating and laxative abuse (L), B + L ($n = 18$); and individuals who reported current binge-eating and both self-induced vomiting and laxative abuse, B + V + L ($n = 63$).

RESULTS

The mean number of days of self-monitoring available for analysis did not differ significantly among the three groups (B + V = 10.8 ± 5.1 ; B + L = 12.2 ± 6.3 ; B + V + L = 11.7 ± 5.5 , NS). Those individuals who were exclusive laxative abusers (B + L; $n = 18$) were significantly older (28.1 ± 6.9 years) than the two other groups (B + V, $n = 41$; 23.7 ± 4.6 years; B + V + L, $n = 63$; 23.7 ± 4.5 years). The mean percent ideal body weight for the B + L group was numerically (111.0 ± 15.4) but not statistically higher (B + V = 104.1 ± 14.4 ; B + V + L = 103.6 ± 14.0).

The composite data on probability of binge eating for the various time intervals across the three groups is summarized in Figure 1. As can be seen, the overall probability of binge eating increased during the afternoon and evening hours for all three groups. The two-way analysis of variance (ANOVA) (group \times time period) showed significant group differences ($F = 3.07$, $p = .05$). On paired comparison two-tailed t tests, the B + V group had a higher mean frequency of binge eating/day (1.78 ± 1.36) than did the frequency of binge eating in either of the other groups (B + L = 1.06 ± 0.62 , $t = -2.14$, p

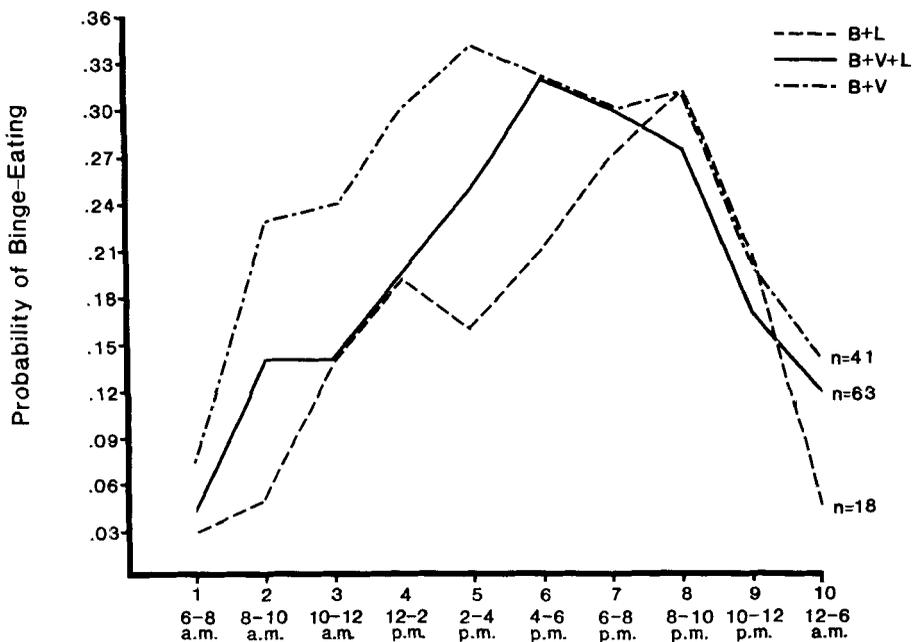


Figure 1. Probability of binge eating for each group.

$< .05$; $B + V + L = 1.22 \pm 0.73$, $t = -2.76$, $p < .01$). The $B + L$ and $B + V + L$ groups did not differ significantly ($t = -.813$, NS). It is also of note that the temporal distributions of the curves are different. The probability of binge eating for the $B + V$ group became elevated in the early afternoon and remained elevated through 10 p.m. The probability of binge eating in the $B + L$ group began to increase dramatically later in the day, particularly after 6 p.m., again with a decrement after 10 p.m. The $B + V + L$ group was intermediate in terms of the period of risk, rising later than the $B + V$ group but before the $B + L$ group.

Data on the occurrence of vomiting in the $B + V$ and the $B + V + L$ groups were examined also. The shapes of the curves are similar; however, the mean frequency of vomiting during each 24-h period was lower in individuals in the $B + V + L$ group (1.49 ± 1.64) than those is in the $B + V$ group (2.16 ± 1.67) ($t = -2.00$, $p < .05$). This may be explained by the inclusion criteria that required three episodes combined vomiting and/or laxative abuse in the $B + V + L$ group. Therefore, a number of subjects with less than 3 vomiting episodes a week were included in the $B + V + L$ group.

The occurrence of laxative abuse by period of day is shown in Figure 2. As can be seen, the curves are fairly similar, with the overall frequency not being different in the $B + L$ group (0.88 ± 0.59) compared to the $B + V + L$ group (0.66 ± 0.71) ($t = 1.22$, NS). In both groups the risk of laxative use increased dramatically at 6 p.m., later than the increased risk for vomiting or binge eating.

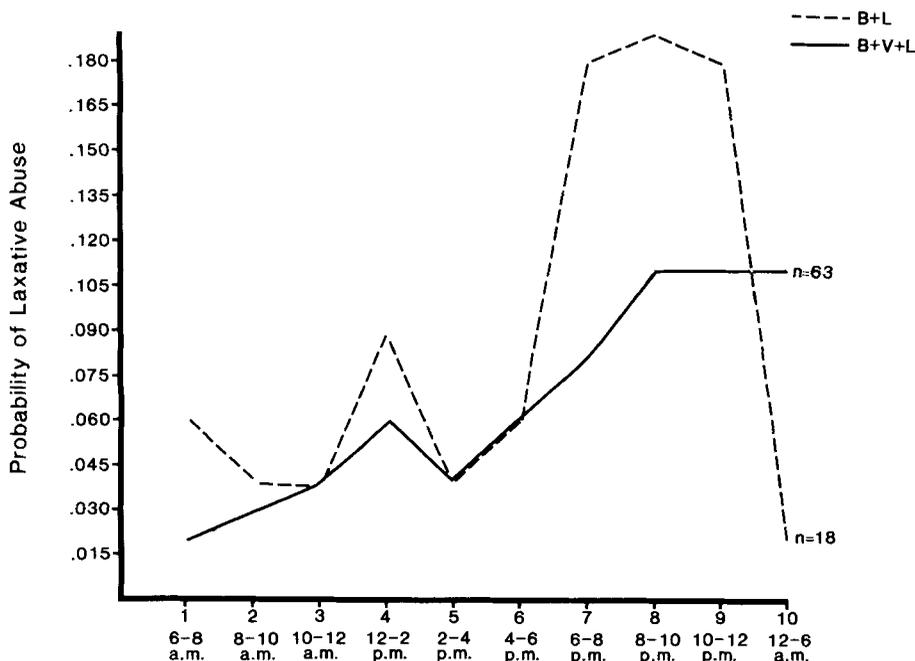


Figure 2. Probability of laxative abuse for each group.

DISCUSSION

The results of this study substantiate the clinical observation that most patients who binge eat in combination with self-induced vomiting and/or laxative abuse tend to do so late in the day (Mitchell et al., 1985). The results also support the observation by Gibson and Lacey (1985) that those who abuse laxatives binge eat less often than those who self-induce vomiting, but tend to weigh more than those who self-induce vomiting, although this difference was not statistically significant in our sample.

The data show a clear difference in the patterns of binge-eating, self-induced vomiting, and laxative abuse among the groups we studied, both as to timing and the number of episodes of bulimic symptoms. Individuals in the B + V group are more likely to binge eat earlier in the day, and to binge eat more often, than those in the B + L group, with the B + L + V group being intermediate in the number of binge eating episodes and times of highest risk. Although the temporal pattern of vomiting for those in the B + V and B + V + L, and the temporal pattern of laxative abuse for those in the groups B + L and B + V + L were similar, patients who self-induced vomiting are likely to do so earlier in the day than are those who use laxatives. This finding was expected and is explainable when we consider the clinical effects of laxative ingestion. Several hours after taking laxatives the individual usually develops diarrhea. It is logical that patients with bulimia nervosa who engage in this behavior would begin the sequence late in the day so that they would experience the effect during the night or in the morning and not at a time when they would be expected to perform at work, school or to be with other people.

These are potential clinical implications of this work. The results document the maximum high-risk periods for these behaviors. These are the periods of time when patients need to develop alternative behaviors as a way of breaking the binge/purge cycle.

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REFERENCES

- Crowther, J. H., Lingswiler, V. M., & Stephens, M. A. P. (1984). The topography of binge-eating. *Addictive Behaviors, 9*, 299-303.
- Davis, R., Freeman, R. J., & Garner, D. M. (1988). A naturalistic investigation of eating behavior in bulimia nervosa. *Journal of Consulting and Clinical Psychology, 56*, 273-279.
- Johnson, C., & Larson, R. (1982). Bulimia: An analysis of moods and behavior. *Psychosomatic Medicine, 44*, 341-351.
- Kissileff, H. R., Walsh, T., Kral, J. G., & Cassiday, S. M. (1986). Laboratory studies of eating behavior in women with bulimia. *Physiology and Behavior, 38*, 563-570.
- Lacey, J. H., & Gibson, E. (1985). Controlling weight by purgation and vomiting: A comparative study of bulimics. *Journal of Psychiatric Research, 19*, 337-341.
- Metropolitan Life Insurance Tables (1989). New height standards for men and women. *Statistical Bulletin, 40*, 1-4.
- Mitchell, J. E., Pyle, R. L., & Eckert, E. D. (1981). Frequency and duration of binge-eating episodes in patients with bulimia. *American Journal of Psychiatry, 136*, 835-836.
- Mitchell, J. E., Hatsukami, D., Eckert, E. D., & Pyle, R. L. (1985). Characteristics of 275 patients with bulimia. *American Journal of Psychiatry, 142*, 482-485.

- Mitchell, J. E., & Laine, D. C. (1985). Monitored binge-eating behavior in patients with bulimia. *International Journal of Eating Disorders*, *4*, 177–183.
- Rosen, J. C., Leitenberg, H., Fisher, C., & Khazam, C. (1986). Binge-eating episodes in bulimia nervosa: The amount and type of food consumed. *International Journal of Eating Disorders*, *5*, 255–267.
- Russell, G. (1979). Bulimia nervosa: An ominous variant of anorexia nervosa. *Psychological Medicine*, *9*, 429–448.