Laxative Abuse Complicating Bulimia: Medical and Treatment Implications

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Literature concerning laxative abuse among young women with bulimia is reviewed. Laxative abuse appears to be much more common among females with bulimia than among females who do not meet criteria for bulimia. Patients with bulimia most commonly abuse stimulant-type laxatives. The abuse of laxatives is associated with potentially serious sequellae involving the gastrointestinal tract as well as generalized systemic effects. The different types of laxatives, their mechanisms of action, and the medical complications of laxative abuse are reviewed. Recommendations regarding laxative withdrawal are offered.

The published laxative abuse literature primarily addresses three groups of adult patients. The first group includes individuals, often women of middle-age, who present with symptoms of chronic constipation and the misuse of laxatives associated with this symptom (Cooke, 1977; Bruckstein, 1980). The second group is composed of identified patients with anorexia nervosa who abuse laxatives (Casper *et al.*, 1980). The third group is comprised primarily of adolescent girls or young women who abuse laxatives, often surreptitiously, for a variety of psychological reasons. A careful examination of the case reports of women in this third group suggests that many of these patients use the laxatives for weight control purposes and that many of these individuals actually may have either anorexia nervosa or bulimia in addition to the laxative abuse pat-

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tern (Frier, 1977; Basser, 1979; Gross *et al.*, 1980; Levine *et al.*, 1981; Darrow, 1982; Weiss & Wood, 1982; Pines *et al.*, 1983).

Although bulimia is usually considered a disorder of binge-eating and self-induced vomiting, recent studies suggest that many patients with bulimia also abuse laxatives (Russell, 1979; Pyle *et al.*, 1981; Johnson *et al.*, 1982; Mitchell *et al.*, 1983). This paper reviews the available data on laxative abuse in females with bulimia. For purposes of comparison, it also reviews available data on laxative abuse in young women not identified as having bulimia. The paper then discusses the various types of laxatives that are reported to be misused, and reviews the medical complications associated with laxative abuse. Finally, the paper offers recommendations for the management of laxative abuse as a complicating factor in patients with bulimia.

EPIDEMIOLOGY OF LAXATIVE ABUSE

Data on the prevalance and frequency of laxative abuse come from two primary sources: (1) population surveys of eating patterns among young women and (2) clinic and nonclinic samples of individuals with bulimia. Unfortunately, it is often difficult to reliably interpret the data on laxative abuse from these sources, since many of the reports do not adequately define and differentiate laxative use and abuse. For the purposes of this review, we will use the term laxative abuse since it is used in much of this literature, while acknowledging the vagueness of this designation.

Four recent population surveys designed to establish the prevalence of bulimia or bulimia nervosa among young women are summarized in Table 1. Three of the four surveys report data from either a high school or college student population. One survey reports data from an outpatient clinic population (Cooper & Fairburn, 1983). In the descriptions of two of the studies (Pyle *et al.*, 1983; Cooper & Fairburn, 1983), an adequate de-

Table 1 Laxative Use/Abuse in Surveys of Nonbulimic Women

		Pyle and Associates 1983	Cooper and Fairburn 1983	Clark and Palmer 1983	Johnson and Associates 1983
Sample Population		College Students	Clinic Students	College Students	High School Students
Number of Subjects		575	369	206	1268
Descriotor in Publication		Laxative abuse for weight control	Laxative abuse for weight control	Laxative use	Laxative use
Incidence		10.4%	4.9%	7.0%	7.7%
Frequency	Weekly	Daily 1.2%	—	—	1.7%
		Daily 0.5%	—	—	1.0%

scription is provided to indicate that subjects were asked specifically about laxative abuse for purposes of weight control; such a criterion is not clearly delineated in the other two reports. Nonetheless, the prevalence rates are quite similar. These data suggest a prevalence of laxative abuse among young women of between 5 and 10%, if laxative abuse is defined as the use of laxatives for weight control purposes.

Two studies have examined the prevalence and frequency of laxative abuse for weight control purposes in bulimic patients (Pyle *et al.*, 1981; Mitchell *et al.*, 1983). One additional study reported data from respondents to a mail-in questionnaire who met DSM-III criteria for bulimia based on their responses (Johnson *et al.*, 1983). These data are summarized in Table 2. Data on the prevalence and frequency of binge-eating and self-induced vomiting are included for reference. As can be seen, most of these individuals were binge-eating and self-inducing vomiting at a fairly high frequency, at least daily in the majority of cases. The prevalence of laxative abuse ranged from approximately 40 to 60%, with approximately 2 to 15% admitting to a period of laxative abuse at a frequency of once a day. The variability of these prevalence and frequency rates among these studies may be due, in part, to the different criteria used to define laxative abuse and the nature of the populations

Table 2. Binge-eating, Vomiting, and Laxative Abuse for Weight Control in Series of Patients or Respondents with Bulimia

	Pyle and Associates 1981	Mitchell and Associates 1983	Johnson and Associates 1983
Source	Patients	Patients	Respondents
Number	34	168	316
Female	34	164	316
Male	0	4	0
Binge-eating			
Daily	55.9%	63.7%	51.5%
Several times/week	35.3%	16.7%	
Weekly	8.8%	6.5%	} 41.8%
Less than weekly	0.0%	3.6%	6.7%
Total	100.0%	94.0%	100.0%
Vomiting			
Daily	47.1%	56.6%	48.0%
Several times/week	26.5%	16.7%	
Weekly	20.0%	6.5%	} 23.2%
Less than weekly	8.0%	4.8%	9.9%
Total	94.1%	84.5%	81.0%
Laxative Abuse			
Daily	1.9%	7.9%	15.4%
Several times/week	8.8%	7.7%	} 19.0%
Weekly	2.9%	10.1%	
Less than weekly	38.2%	12.5%	28.6%
Total	52.9%	38.1%	63.0%

surveyed. Nonetheless these data indicate that laxative abuse is quite common among bulimic individuals and apparently is much more common in bulimic females than in young women of college age who are not bulimic.

PATTERN OF LAXATIVE ABUSE IN BULIMIA

The laxative usage seen clinically in patients in bulimia usually involves the ingestion of laxatives, in amounts which are often in excess of those recommended on the package. Bulimic patients use laxatives, as they use self-induced vomiting, in an attempt to rid themselves of food. Most think that by inducing diarrhea with the laxatives, they can prevent the absorption of food and avoid weight gain or promote weight loss. However, one recent study suggests that laxative abuse cases primarily lose fluid with minimal caloric loss (Bo-Linn *et al.*, 1983). This question deserves further research. Although all classes of laxatives are misused by patients with bulimia, the class which is most commonly misused in the stimulant type, particularly compounds containing phenolphthalein (Mitchell *et al.*, in submission).

CLASSIFICATION AND MECHANISMS OF ACTION

Laxatives vary as to their site and mechanism of action and are traditionally grouped into five classes. Table 3 lists these five classes of laxatives along with examples and a brief summary of their mechanisms of action (Cooke, 1977; Cummings, 1974; Bruchstein, 1978; Bruchstein,

Table 3. Types, Examples and Mechanisms of Action of Different Classes

	Mechanisms of Action	Generic Example	Brand Examples
Bulk	Mechanical distention	Psyllium	Metamucil
Osmotics	Retain water Stimulate CCK	Magnesium Salts	Milk of Magnesia
Surfactants	Detergent—soften stool Inhibit water absorption	Dioctyl Sodium Suphosuccinate	Colace
Emolients	Lubricate Retard water absorption	Mineral oil	Agoral
Stimulants	Stimulate myenteric plexus	Anthraquinones (Senna, cascara)	Senokot
	Stimulate bowel to secrete water and electrolytes	Phenolphthalein	Correctol* Ex -Lax

**Also contains surfactant agent.*

1980; MacCara, 1982). The stimulant class are favored by patients with bulimia because of their rapidity of action and the fact that they can, in sufficient doses, reliably produce a watery diarrhea.

MEDICAL COMPLICATIONS OF LAXATIVE ABUSE

Complications of laxative abuse will depend on the type of laxatives used, the duration of abuse, and the amounts ingested. Complications associated with laxative abuse can be grouped into two major types: those involving bowel function which result from direct actions of the drugs on the gastrointestinal tract, and those involving systemic drug effects. Gastrointestinal complications will be reviewed first and include the following:

1. *Constipation:* As is well known clinically, the use of laxatives, particularly stimulant-type laxatives, results in reflex hypofunctioning of the bowel and constipation (Cooke, 1977). If usage of the drug continues, tolerance develops and constipation worsens. This may lead patients to increase the dosage. Constipation becomes particularly troublesome when laxatives are withdrawn. Not uncommonly, constipation may continue for several weeks following laxative withdrawal.
2. *Cathartic colon:* Patients who have abused stimulant-type laxatives can develop permanent impairment in colonic functioning. This appears to develop most commonly following years of laxative abuse. The clinical symptoms are ongoing profound constipation, abdominal pain, and bloating. On X-ray examination, the colon appears shortened and demonstrates a loss of normal haustral markings with a smooth mucosa, a pattern reminiscent of the changes seen in ulcerative colitis (Kim *et al.*, 1978). Upon pathological examination of biopsy material, the colonic mucosa appears smooth and atrophic with multiple punctate superficial ulcers and evidence of chronic inflammatory changes in the mucosal wall (Kim *et al.*, 1978; Reimann *et al.*, 1978; Riemann & Schmidt, 1982). These pathological signs are again suggestive of chronic ulcerative colitis in remission (Kim *et al.*, 1978). Such changes in bowel architecture indicate that normal bowel function may not return.
3. *GI bleeding:* This is most often seen in association with stimulant-type laxatives. Patients can develop frank bleeding or occult bleeding with hematest positive stools. Chronic blood loss associated with laxative abuse can result in anemia (Weiss & Wood, 1982).
4. *Steatorrhea:* The loss of abnormal amounts of fat in the stool can result from chronic laxative abuse, particularly with the abuse of

stimulant or osmotic laxatives (Cummings, 1974). The pathophysiology of the steatorrhea is unknown but may result from the rapid transit time (Larusso & McGill, 1975) or may be secondary to inhibition of intestinal ATPase (Cummings, 1974).

5. *Protein-losing gastroenteropathy:* A pattern of significant protein loss through the bowel has been described in association with laxative abuse (Larusso & McGill, 1975).
6. *Esophageal obstruction:* A few cases of esophageal obstruction have been described. This results from the ingestion of hydrophyllic or bulk-type laxatives without adequate amounts of fluid (Sandeman *et al.*, 1980; Sauerbach *et al.*, 1980).
7. *Pancreatic dysfunction:* Hypoplasia of non-beta cell pancreatic islet cell tissue has also been described (Lesna *et al.*, 1977) as has the development of carbohydrate intolerance with diabetic glucose tolerance curves (Cummings, 1974).
8. *Melanosis coli:* Patients who abuse anthraquinone compounds, such as those containing senna or cascara, may develop permanent pigmentation of the colonic mucosa (Morris & Turnberg, 1979; Geboes & Bossaert, 1980).

Nongastrointestinal complications include:

1. *Dehydration:* Laxatives, particularly stimulant-type laxatives, promote fluid loss through the intestine. This often leads to volume depletion. This volume depletion is particularly troublesome since many patients with eating disorders feel "thinner" when dehydrated, and therefore do not compensate for the gastrointestinal losses with adequate oral fluid intake.
2. *Edema:* Volume depletion leads to the generation of hyperaldosteronism which can result in peripheral edema, particularly in association with laxative withdrawal (Ullrich & Lizarralde, 1978; Gross *et al.*, 1980). This edema can be dramatic and be accompanied by a gain in weight to 2 to 8 kilograms over a period of a week.
3. *Allergic reactions:* Allergic reactions appear to be most common with phenolphthalein-containing compounds (MacCara, 1982).
4. *Electrolyte abnormalities:* Patients with laxative abuse often demonstrate significant electrolyte abnormalities (Oster *et al.*, 1980). The induction of diarrhea leads to a marked increase in the electrolyte concentration in the feces. Hypochloremia and hypokalemia have been most commonly described (Cooke, 1977; Darrow, 1982; Mitchell *et al.*, 1983). In patients with bulimia who use laxatives, it is often difficult to tease out the relative contribution of the various behaviors to these electrolyte abnormalities, since most of these patients are also self-inducing vomiting, a behavior which causes the loss of large amounts of chloride and hydrogen ion.

5. *Metabolic changes:* Several metabolic changes have been described secondary to the loss of important nutrients through the bowel. These include hypocalcemia (Silva, 1978) and tetany (Prior & White, 1978; Jimenez & Larson, 1981), hypokalemic paralysis (Basser, 1979), and muscle weakness associated with hypomagnesemia (Swift, 1979).
6. *Musculoskeletal:* Bone changes have been reported in patients who abuse laxatives and may result from the loss of vitamin D. Problems described include osteomalacia, pseudofractures, and hypotrophic osteorthropathy (Cummings, 1974; Frier, 1977; Silva, 1978; Armstrong *et al.*, 1981). Finger clubbing has also been reported, but the pathophysiology of this complication is unknown (Silva, 1978; Levine *et al.*, 1981; Pines *et al.*, 1983).
7. *Other:* Chronic mineral oil usage may result in deposition of this substance in various tissues including the small intestines, abdominal lymph nodes, liver, and spleen with resulting organ malfunction (Nochomovitz *et al.*, 1975; Heckers *et al.*, 1978). A patient who developed hypogammaglobulinemia with an absence of circulating lymphocytes in association with abuse of senna-containing laxative has been reported (Levine *et al.*, 1981).

IMPLICATIONS FOR EVALUATION AND TREATMENT OF PATIENTS WITH BULIMIA

The available data indicate that laxative abuse is a common problem among bulimic patients; however, this problem may not be readily admitted by these patients. A careful history which includes direct questions regarding laxative use/abuse should be obtained in all eating disorder patients. Detailed information about the types of laxatives used, usual and maximum amounts ingested, and the reasons for using the laxatives should be included. In particular, the use of laxatives in an attempt to "get rid" of food by preventing absorption of ingested calories through induction of diarrhea should be explored. Careful physical and laboratory assessment is also indicated to rule out the medical complications of laxative abuse. Laboratory tests to be considered (in addition to other routine testing) include: a CBC (to exclude anemia), serum protein determinations (to exclude protein losing gastroenteropathy), serum calcium, magnesium, and electrolytes (to rule out hypocalcemia, hypomagnesemia, and other electrolyte abnormalities), and a stool examination for blood (to rule out gastrointestinal bleeding).

The reflex constipation and fluid retention which accompany laxative withdrawal can be difficult to manage, since patients often react strongly to these complications. They begin to feel heavier and bloated and all too frequently respond by ingesting laxatives, typically of the stimulant type.

Some patients lack the motivation and commitment to tolerate laxative withdrawal on their own and may require hospitalization. However, many patients can be successfully treated as outpatients. Whether one is working with inpatients or outpatients, guidelines can be offered concerning the management of laxative abuse complicating bulimia:

1. The use of the stimulant-type laxatives should be discontinued.
2. Patients need to be informed about what to expect. Fluid retention is quite frightening for these patients. They need to be told that the fluid retention is common and time-limited.
3. The necessity for adequate fluid intake needs to be stressed. Patients will often restrict fluids in an attempt to compensate for the fluid retention and the bloated feeling associated with laxative withdrawal. This fluid restriction promotes dehydration and leads to further constipation, which compounds the problem and may predispose one to further laxative usage.
4. Regular physical activity should be stressed as a way to regulate bowel function.
5. Patients need to be placed on a high-fiber diet with the possible addition of bran or, if needed, psyllium containing laxatives (e.g., Metamucil). When taking psyllium-containing laxatives, patients need to be instructed to increase fluid intake in order to minimize the risk of impaction. Such a regimen will ensure adquate bulk and promote bowel functioning. If psyllium-containing laxatives are used, they probably should be employed only as treatment for the withdrawal and not as ongoing therapy.
6. Patients need to be instructed to carefully monitor the frequency of bowel movements. Prolonged constipation beyond several days needs to be avoided in order to prevent bowel obstruction. If pharmacological treatment becomes necessary, such as the use of an osmotic-type laxative, it should be employed only as treatment for the withdrawal and not as ongoing therapy.

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