


Postoperative Dumping Syndrome after Gastrointestinal Surgery: A Brief Review

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ABSTRACT

Dumping syndrome is a common postoperative complication in patients who undergo procedures that alter the anatomy or motility of the gastrointestinal tract, such as gastrectomy's and bariatric surgeries. It is characterized by accelerated gastric emptying and the abrupt passage of hyper-osmolar chyme into the small intestine, triggering neuro-hormonal and vasomotor responses that result in diverse symptoms. Clinical manifestations may include abdominal discomfort, nausea, diarrhea, sweating, palpitations and even episodes of hypotension and syncope. This work reviewed the literature in databases such as PubMed, ScienceDirect and SciELO, encompassing original studies and reviews published in the last fifteen years. The underlying pathophysiological mechanisms involve excessive release of intestinal peptides, such as cholecystokinin and peptide YY, combined with an exaggerated insulin response and late hypoglycemia. The variability of clinical presentations and the lack of standardized diagnostic protocols hamper early identification, requiring detailed assessments with functional tests and specific questionnaires. In therapeutic management, dietary interventions that fractionate meals and reduce simple carbohydrates constitute the initial cornerstone, supplemented by pharmacological agents that delay gastric emptying or modulate the hormonal response. In refractory cases, revisional surgery may be considered. The importance of a multidisciplinary approach involving gastroenterologists, nutritionists and surgeons is emphasized in order to optimize quality of life. It is concluded that advances in diagnostic standardization and prospective studies are essential to improve clinical management and reduce the morbidity associated with dumping syndrome.

Keywords: Dumping syndrome; Gastrointestinal surgery; Gastric emptying; Multidisciplinary approach; Quality of life

Introduction

Postoperative dumping syndrome represents a growing challenge in clinical practice and is observed most frequently in patients who have undergone partial gastrectomy, gastric bypass and other interventions that modify the anatomy and physiology of the digestive tract¹. The condition is characterized by accelerated gastric emptying that rapidly delivers hyper-osmolar chyme to the small intestine. This process triggers the

release of intestinal peptides such as peptide YY, cholecystokinin and enteroglucagon and stimulates disproportionate insulin secretion, resulting in late hypoglycemia and vasomotor manifestations^{2,3}. Clinically, dumping syndrome is divided into early and late forms. Early dumping occurs within 30 minutes after a meal and is caused by the rapid arrival of hyper-osmolar chyme in the small intestine. Fluid shifts from the bloodstream into the intestinal lumen to dilute the food, distending the intestine and provoking abdominal discomfort, diarrhea, nausea,

sweating, dizziness and tachycardia. Late dumping manifests one to three hours post-prandially and results from a sudden increase in glucose absorption that induces high insulin levels, predominating as hypoglycemic symptoms such as weakness, tremors, sweating and mental confusion^{4,5}.

In both cases, there is a significant impact on quality of life, with reports of limitations in daily activities and anxiety related to eating^{6,7}. Incidence varies according to the procedure type and diagnostic criteria employed, reaching 40 % after gastrectomy and 20–30 % after bariatric surgery^{8,9}. Risk factors include residual gastric volume, surgical technique, eating speed and individual predisposition related to insulin sensitivity^{10,11}. Diagnosis is based on a thorough history, laboratory tests (post-prandial capillary glucose testing), specific questionnaires and, in selected cases, gastric emptying studies with isotope labeling or scintigraphy^{12,13}. However, the absence of consensus on standardized criteria hinders comparisons between studies and the adoption of uniform guidelines.

Therapeutically, dietary modification with meal fractionation, reduction of simple carbohydrates and increased soluble fiber is widely recommended as first-line intervention^{14,3}. When insufficient, pharmacotherapies that delay gastric emptying, such as non-absorbable sweeteners and somatostatin analogues, can be employed¹³. In refractory patients, surgical revisions to narrow the anastomotic lumen or temporarily reverse food flow have been described⁷. Given the variability of presentations and the complexity of the mechanisms involved, a multidisciplinary approach involving gastroenterology, clinical nutrition, endocrinology and surgery teams is required to define individualized strategies^{8,5}. Longitudinal, multicenter studies are fundamental to validate protocols and improve the clinical course of these patients.

Objectives

This review aims to comprehensively analyze the pathophysiological, diagnostic and therapeutic aspects of dumping syndrome, providing insights for strategies that improve clinical outcomes and patient quality of life.

Materials and Methods

A review of the scientific literature was conducted using the PubMed, SciELO, Google Scholar and ScienceDirect databases.

Discussion

Discussion of postoperative dumping syndrome encompasses pathophysiological, diagnostic and therapeutic aspects. From the pathophysiological standpoint, excessively rapid gastric emptying allows the sudden arrival of hyper-osmolar chyme in the small intestine, often due to removal of or damage to the pylorus during surgery, enabling undigested food to reach the intestine more quickly. This trigger accelerated release of intestinal hormones such as cholecystokinin, peptide YY and enteroglucagon, stimulating vagovagal reflexes and an exaggerated insulin response, culminating in vasomotor and gastrointestinal symptoms^{2,10}. Diagnostic challenges involve clinical heterogeneity and the absence of widely agreed criteria. Standardized questionnaires and functional tests, such as serial post-prandial glucose measurements, have shown variable sensitivity, requiring a combination of methods for greater accuracy¹². Gastric emptying scintigraphy, when available,

provides quantitative data, but its use is limited by cost and availability¹¹.

Dietary interventions are the foundation of initial management. Meal fractionation and restriction of high-glycemic-index carbohydrates seek to attenuate the osmotic stimulus and slow gastric emptying¹⁴. Pharmacologic agents such as somatostatin analogues (octreotide) and GLP-1 agonists have shown benefits by modulating motility and hormonal responses, although prolonged use requires monitoring of adverse effects^{13,7}. In refractory cases, revisional surgery can provide significant symptomatic relief. Procedures that narrow the anastomotic diameter or partially divert food flow exhibit good success rates, but require careful risk-benefit evaluation⁸.

Long-term nutritional and psychological follow-up is essential. Nutritional deficiencies may occur owing to chronic caloric restriction and periodic vitamin and mineral supplementation is recommended³. Psychological factors such as anxiety and fear of eating negatively affect treatment adherence, reinforcing the need for multidisciplinary support⁶. To advance clinical management, randomized prospective studies and multicenter collaborations that validate diagnostic and therapeutic protocols are needed. Standardizing definitions and criteria will enable more robust comparisons and stronger evidence for clinical guidelines^{9,5}.

Conclusion

Postoperative dumping syndrome is a multifactorial complication that significantly impairs the quality of life of patients undergoing gastrointestinal surgery. Accelerated gastric emptying and exaggerated neuro-hormonal responses lie at the core of its pathophysiology, causing symptoms that range from abdominal discomfort to episodes of hypotension and late hypoglycemia^{2,10}. Early diagnosis depends on accurate clinical recognition and combined assessment methods, including standardized questionnaires, post-prandial glucose testing and, when feasible, gastric emptying studies^{12,11}.

Dietary intervention with meal fractionation and restriction of simple carbohydrates is the mainstay of therapy. Pharmacotherapy with agents that modulate motility and hormonal secretion complements dietary measures in moderate to severe cases^{13,7}. Refractory patients may benefit from revisional surgery to adjust the anastomotic lumen, although individualized risk assessment is required⁸.

A multidisciplinary approach involving gastroenterologists, nutritionists, endocrinologists and surgeons is essential to personalize management and adequately monitor nutritional, metabolic and psychological aspects^{14,3}. Despite advances, gaps remain in diagnostic and therapeutic standardization. Multicenter, prospective, randomized studies are needed to validate protocols and develop guidelines based on robust evidence. Consolidating uniform definitions will permit better comparability between studies and optimize clinical care, reducing morbidity and improving patient quality of life.

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