Acarbose promotes remission of both early and late dumping syndromes in post-bariatric patients

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Objective: Acarbose is a glucosidase inhibitor that slows carbohydrate digestion. It could thus be effective to promote remission of dumping syndrome (DS). Previous studies associating acarbose and late dumping, although not early dumping, have been reported. Herein, we aimed to evaluate the role of acarbose in dumping syndrome prevention and treatment and in resistive exercises resistance in bariatric subjects.

Methods: Bariatric patients with DS and complete adherence to diet plan and resistive exercises were included (n = 25). Number of early and late episodes, self-referred intensity of each episode, and ability to increase intensity of resistive exercise were evaluated, on a 0–10 scale. Acarbose was administered orally (50 mg) for 6 months, 4–5 times a day before meals.

Results: Acarbose administration was associated with a decrease in the number of early (2.18–0.31) and late (2.79–0.12) episodes per week and intensity of each episode (6.10–1.65) and an increase in the ability to perform resistive exercises (3.03–7.12). Complete remission of DS was seen in 21 patients (84%), which persisted for 6 months with the use of acarbose.

Conclusion: Acarbose prevented dumping in almost all studied subjects and helped improve exercise capacity.

Keywords: dumping syndrome, bariatric surgery, post-bariatric, obesity

Introduction

Dumping syndrome (DS) is the effect of rapid gastric emptying with consequent hyperosmolar jejunal chime, inappropriate gut-hormone release, and rapid glucose absorption, and it is particularly common among post-bariatric surgery patients, as it occurs in up to 75% of patients after Roux-en-Y gastric bypass surgery.¹⁻⁵ DS can be either early – when symptoms happen between 30 and 60 min as a result of rapid instillation of meals into the small bowel and decreased blood volume due to intraluminal fluid sequestration, and most symptoms are abdominal (bloating and abdominal pain) and systemic (palpitations, fatigue, tachycardia, lightheadedness, and syncope) – or late, which is thought to be caused by hyperinsulinemic hypoglycemia, and the most commonly observed symptom is due to neuroglycopenia and hyperadrenergic state (decreased consciousness, shakiness, and difficulty to concentrate). It is important to note that often patients may present both early and late DS at the same meal. DS reduces the quality of life as symptoms are usually severe and can limit sports capacity and everyday activities.¹⁻⁷

Current approaches for DS treatment comprise dietary recommendations³,⁴,⁶ such as small and frequent meals, inclusion of fiber and protein in every meal, and ingestion
of guar gum and pectin. Pharmacological options for DS are limited and mostly symptomatic, such as tincture opium for diarrhea,7 meclizine, promethazine, and proton pump inhibitors.14,16 Octreotide has been shown to be markedly effective to improve the quality of life in DS,8,9 despite commercial and financial limitations and significant side effects. However, most of the potential benefits of the current approaches are observed only in late DS, but not in the early DS, nor in exercise-induced dumping, a condition described that affects some post-bariatric athletes,10–12 specially during intense physical activities,10,11 whose pathophysiology remains uncertain but may be due to exacerbation of gastrointestinal physiological adaptions to physical activity.11

Indeed, there is a lack of previous papers focusing on the management of exercise-induced DS, except for expert opinion and experience and non-scientific recommendations.13 A recent review on management of DS has been published and reinforces the lack of papers about correlations between physical activity and DS.4

Acarbose, a glucosidase inhibitor that slows carbohydrate digestion and is primarily prescribed as an antidiabetic agent has been shown to be effective in late DS,6,14–16 but has not been studied for early DS: rationale of protection of late dumping by acarbose is based on the fact that this drug delays glucose absorption; thus, hyperinsulinemic hypoglycemia due to excessive insulin release by incretin and by direct glucose stimulation is prevented by acarbose.14,16 Furthermore, acarbose has the potential benefit to prevent beta-cell hypertrophy and hyperplasia; indeed, hyperinsulinemic hypoglycemia, one of the main cornerstone aspects of DS, has a significant improvement by acarbose.6,17,18

Other studies with acarbose in DS have not been performed, as severe side effects such as excessive flatulence14 had limited its use. Despite the benefits, acarbose has not been standardized as part of protocols to manage DS symptoms.3

Despite the symptomatic limitations of acarbose, the lack of efficient options to prevent and improve DS and the strong likelihood of acarbose to improve both early and late DS encouraged us to undertake this study. Therefore, we aimed to evaluate the role of acarbose in prevention and treatment of DS and in resistive exercises resistance in bariatric subjects.

Methods
Selection of subjects
Patients who previously underwent Roux-en-Y gastric bypass surgery, achieved body weight goal (body mass index <27 kg/m² for men and <25 kg/m² for women), had a confirmed diagnosis of DS and were refractory to diet recommendations were initially selected. Inclusion criteria were the complete adherence to an isocaloric (calculated by indirect calorimetry) and high protein (1.5–1.8 g/kg/day) diet plan, proposed resistive exercises (frequency, intensity, and exercise prescription varied among individuals), and age between 18 and 80 years. Patients who lacked regular follow-up were excluded.

Intervention
Fifty milligrams of acarbose was orally administered 4–5 times a day before meals for 6 months. For those patients who presented with severe flatulence, 120 mg simethicone (b.i.d.) was additionally prescribed. The dose of 50 mg before meals has been extensively studied and standardized,14–16 whereas the addition of simethicone was thought to attenuate the most important adverse effects of acarbose use (abdominal cramps, bloating, and flatulence).

Evaluated aspects
Multiple patterns of DS were evaluated: 1) number of early (0–45 min) DS episodes per week and 2) number of late (45–240 min) DS episodes a week. The DS severity evaluation methods were 1) self-referred intensity of each episode: rated from 1 (almost asymptomatic) to 10 (loss of conscious), 2) Sigstad’s scoring system to evaluate diagnosis and intensity of DS (shock +5; fainting, syncope, or unconsciousness +4; desire to lie down +4; dyspnea +3; weakness +3; sleepiness, apathy +3; palpitations +3; restlessness +2; dizziness +2; headaches +1; warm, clammy skin, or pallor +1; nausea +1; abdominal fullness +1; borborygmus +1; eructation −1; vomiting −4), and 3) ability to perform resistive exercises: rated from 0 (any effort induces DS symptoms) to 10 (no symptoms, even in intensive weight lifting). Subjects were prospectively instructed to evaluate and write down the frequency and severity of DS episodes and to bring the results at each visit, which happened every 2 weeks for 6 months. We proposed that those patients who presented a significant improvement of DS symptoms could continue the therapy after the end of the study. In each visit, subjects were actively queried about missing doses and irregular use.

Ethical approval
The proposed study protocol did not provide new or experimental therapies, but analyzed standardized modalities, and therefore approval from an ethics committee was not required. The exemption was issued by the national review board and ethics committee system (Systema CEP-CONEP – Plataforma
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placebo-controlled double-blind clinical trials with monitoring of vital signs and glucose should be performed in order to confirm our findings. Until then, acarbose may be treated as an option for refractory DS subjects.

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**Disclosure**
The authors report no conflicts of interest in this work.

**References**