FOREGUT PHYSIOLOGY AFTER BARIATRIC SURGERY: AN INTEGRATED LITERATURE REVIEW

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INTRODUCTION

As the prevalence of obesity and weight loss surgeries being performed in the United States have increased, it is important to identify and understand the functional and nutritional consequences that occur in the foregut after bariatric surgery. The adjustable gastric band (AGB), vertical sleeve gastrectomy (VSG), and the Roux-en-Y gastric bypass (RYGB) have been proven to be effective in leading to long-lasting weight loss, significant improvement in obesity-related comorbidities, and reducing overall mortality rate by 50%. However, by altering the physiology and anatomy of the digestive system many patients experience changes in foregut motility, gastric acid secretion, reflux, and gastrointestinal hormone activity.

METHODS

A literature search for published full text articles on experimental and clinical studies written in the English language and published between 2000 and 2021 was performed using PubMed online database. The search strategy included using the phrase “bariatric surgery”, “gastric banding”, “gastrectomy”, “roux en y gastric bypass” or “biliopancreatic diversion” with each of the following phrases, “motility”, “gastroesophageal reflux”, “gastric secretion”, “gastrointestinal hormones”, and “absorption”. The last search was conducted in March of 2021. This article serves as a framework for the impact of bariatric surgery on foregut physiology.

RESULTS

	Adjustable Gastric Band	Vertical Sleeve Gastrectomy	Roux-en-Y Gastric Bypass
Motility			
Esophageal	Incomplete LES relaxation	Unclear	Dysmotility uncommon
Gastric	Unchanged	Increased gastric emptying	Increased gastric emptying
Small bowel	Unchanged	Decreased small bowel motility due to ileal brake	Increased small bowel motility
Acid Secretion	Unchanged	Increased	Increased
GERD	Decreased	Increased, but can be decreased with hiatal hernia repair	Decreased
GI hormones			
Ghrelin	Increased	Decreased	Decreased
Insulin	Unchanged	Decreased	Decreased
GLP-1	Unchanged	Decreased	Decreased
GLP-2	Unclear	Unclear	Unclear
GIP	Slightly increased	Unchanged	Unclear
PYY	Increased	Increased	Increased
Nutrients	Decreased food intake, no changes with absorption	Iron/B12 deficiency, no change in protein, fat, carbohydrate absorption	Iron/B12 deficiency, decreased fat absorption, no change in protein/ carb absorption

CONCLUSION

Bariatric surgery offers a long-term weight loss solution and concomitant treatment of comorbid diseases such as type II diabetes, coronary artery disease, and obstructive sleep apnea in the severely obese populations. As the incidence and prevalence of obesity continues to rise worldwide, bariatric and metabolic surgeries are becoming more popular. Given this, it is essential to recognize the functional and nutritional effects of commonly performed bariatric procedures in order to provide the highest level of care through the most appropriate surgery for the patient.

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