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Original article

Red meat intolerance in patients submitted to gastric bypass: a 4-year follow-up study

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Abstract

Background: Bariatric surgery provides significant weight reduction; however, it may result in food intolerance followed by gastrointestinal complications that may lead to nutritional deficiencies. This study evaluated the influence of red meat intolerance on the dietary pattern, biochemical indicators, and clinical symptoms after Roux-en-Y gastric bypass (RYGB).

Methods: This retrospective study evaluated patients 4 years after RYGB. The patients were divided into 2 groups: patients with and without red meat intolerance, and data for the following were collected: food intake, anthropometric data, biochemical data, and presence of nausea, vomiting, weakness, weak nails, and hair loss. The difference between groups in the times postoperative was determined by ANOVA.

Results: Of the 72 patients included in the study, 63 were evaluated during the first postoperative year, 45 during the second, 56 during the third, and 41 during the fourth. Red meat intolerance was observed in 49.2%, 42.2%, 46.4%, and 39% of the patients after 1, 2, 3, and 4 years, respectively. After 1 year, the intolerant group showed lower calorie, carbohydrate, and iron intake. After 3 years, tolerant patients showed weight regain (2.9 ± 5.3 kg), while the intolerant ones remained stable. There was no difference in the presence of clinical symptoms or biochemical indicators between groups.

Conclusion: Red meat intolerance is frequent after bariatric surgery and may alter energy, iron intake, and weight loss; however, it is not associated with the presence of clinical symptoms and biochemical profile. (Surg Obes Relat Dis 2015;▮:00–00.)

Keywords: Bariatric surgery; Gastric bypass; Red meat intolerance; Food intake; Protein intake

Roux-en-Y gastric bypass (RYGB) is the surgical technique most frequently used [1], resulting in a 30% to 40% reduction of initial weight [2]. Although this surgery can produce positive results, complications may occur during the postoperative period.

Food intolerance is related to common symptoms occurring during the postoperative period, such as vomiting, diarrhea, constipation, weakness, and changes in taste, with a consequent reduction of food intake [3] that may lead to or worsen the nutritional deficiencies [4–5]. Intolerance tends to decrease with postoperative time, but may occasionally persist because of the patient's fear of eating certain foods [4,6].

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The main types of intolerance are related to the intake of red meat, rice, and leafy vegetables. Studies have shown that 50% of patients have red meat intolerance after bariatric surgery [7,8]. There is a lack of studies investigating food intolerance and its real nutritional consequences during the postoperative period.

The objective of the present study was to assess the influence of red meat intolerance on the dietary pattern, biochemical indicators, and clinical symptoms after RYGB.

Methods

This was a retrospective study conducted on patients of both sexes submitted to bariatric surgery by the RYGB technique. Patients who had completed 4 years of postoperative follow-up and who had complete information in their medical records were eligible to be included in this study. All operations were performed by open surgery by the same surgeons' team and consisted of reduction of the gastric capacity to 20–50 mL and bypass of the duodenum and proximal jejunum, with food and biliopancreatic limbs measuring about 100 cm. The anastomosis was handsewn, and gastrojejunostomy was performed tight over a 12-gauge tub. The study was approved by the ethics committee of the institution. Data were collected before surgery (preoperative) and at 1, 2, 3, and 4 years after surgery.

Anthropometric evaluation was based on the determination of weight (kg), height (m), and body mass index (BMI, kg/m). Food intake was determined by the 24-hour food recall using the software "Sistema de Apoio à Nutrição" (Nutrition Support System) (NutWin 2.5, Federal University of Sao Paulo, Sao Paulo, Brazil).

For the purposes of the study, the patients were divided into 2 groups: group TOL, with red meat tolerance, and group INTOL, with red meat intolerance. The presence of food intolerance and clinical symptoms was determined by asking objective questions during the ambulatory visits (Table 1). Food intolerance was defined as an abnormal physiologic response (nausea and vomiting) after eating red meat [9]. To confirm that red meat was the culprit of the intolerance, intolerant individuals were classified as those patients who had nausea/vomiting after all attempts to ingest red meat. If the patient had such symptoms after ingestion of other meats (chicken, pork, or fish) or other foods, then the incidence was treated as food intolerance but was not classified as red meat intolerance.

Table 1
Objective questions about food intolerance and clinical symptoms

Do you have food intolerance?	( )Yes ( )No
Which food? -	
Do you have nausea after red meat intake?	( )Yes ( )No
Do you have vomiting after red meat intake?	( )Yes ( )No
Do you have diarrhea after red meat intake?	( )Yes ( )No
Do you have weak nails?	( )Yes ( )No
Do you have hair loss?	( )Yes ( )No
Do you have weakness?	( )Yes ( )No

Clinical symptoms affecting the gastrointestinal tract (nausea, vomiting, and diarrhea) and signs associated with malnutrition (weakness, weak or brittle nails, and hair loss) were tabulated according to patients' reports.

Blood samples were collected in the morning after a 12-hour fast, and plasma was used for biochemical analyses (albumin, total protein, iron, calcium, latent iron-binding capacity, ferritin, iron saturation, hemoglobin, and hematocrit).

During the study, all participants were taking a multivitamin/mineral supplement (1 capsule/d) containing 60 mg iron (ferrous fumarate). No patient was taking a protein supplement.

Statistical analysis

Data are reported as mean ± SD. The Kolmogorov-Smirnov test was used to determine data normality, and the ANOVA with post hoc Bonferroni was used to determine the difference between variables and postoperative time (1, 2, 3, and 4 years after surgery). The χ^2 test was used to determine possible associations between the qualitative variables. All analyses were performed using the Statistical Package for the Social Sciences software (SPSS Inc., version 17.0, Chicago, IL), considering $P < .05$.

Results

A total of 72 patients (86% women, mean age 42 ± 9 years) submitted to RYGB were included. Of these, 63 were evaluated at the first postoperative year (attrition rate: –12.5%), 45 at the second (attrition rate: –28.6%), 56 at the third (attrition rate: +24.4%), and 41 at the fourth (attrition rate: –24.8%). The mean weight and BMI during the preoperative period was 142 ± 24 kg and 53 ± 8 kg/m², respectively. Also, during this period, the patients were consuming 1644 ± 569 kcal/d, 76 ± 34 g/d of protein, and 12 ± 6 mg/d of iron. On average, all the biochemical indicators were within the normal range, especially iron.

Based on the questionnaire (Table 1), it was determined that 49.2% developed red meat intolerance 1 year after surgery; the same occurred in 42.2%, 46.4%, and 39% of the patients at 2, 3, and 4 years after surgery, respectively. After 3 years, a difference in weight loss was observed, with TOL presenting weight regain (2.9 ± 5.3 kg) and INTOL remaining stable.

Intolerant individuals reported a lower red meat intake (once per week or never) than tolerant individuals. The INTOL group showed lower calorie, carbohydrate, and iron intake 1 year after surgery, and after 4 years, the INTOL patients showed lower lipid intake (Table 2).

No differences between the TOL group and the INTOL group were observed for the occurrence of nausea,