

Nutritional care of the patient after metabolic surgery: a misunderstood discipline

Cuidado nutricional del paciente posterior a cirugía metabólica: una disciplina incomprendida

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To the editor:

Metabolic and bariatric surgery (MBS) is an efficient method of weight loss and has been linked to improvements in health conditions and quality of life related to obesity as well as a decrease in mortality. Reduced micro-nutrient absorption and changes in gut-brain hormonal control are two post-surgical anatomical and physiological changes that have a wide range of health-related effects. For long-term success, patients require continual evaluation of their physical and mental health. Internists, especially primary care physicians, are in a perfect position to monitor for non-serious consequences in the short and long term, adjust therapy of chronic diseases as necessary, and keep an eye on changes in mental health. In the United States, about 260,000 MBS treatments were carried out each year as of 2019¹. In 2015, between 30% and 60% of all MBS procedures in the United States were laparoscopic Roux-en-Y gastric bypass (RYGB) and laparoscopic sleeve gastrectomy (SG), respectively. The average weight loss after MBS is 25% to 30% of pre-operative weight 1 year after SG and 30-35% after RYGB².

To maximize weight reduction, ameliorate coexisting diseases, lower the chance of gaining weight again, prevent malnutrition, and lessen gastrointestinal side effects, long-term dietary management is necessary. Long-term impacts of physiological and hormonal changes following MBS include weight loss, dietary intake and absorption, medication management,

gastrointestinal problems, mental health, and reproductive health. Due to this, follow-up care should be interdisciplinary and involve primary care clinicians, the bariatric surgery team, mental health specialists, and dietitians³. Recommendations for macro- and micronutrient monitoring and supplementation after MBS are summarized in table 1^{2,4}. Severe nutritional complications after bariatric surgery are potentially disabling and life-threatening, but they are often easily preventable. Despite this, it is challenging to determine the frequency of nutritional deficiencies brought on by surgery, and their reported prevalence varies widely depending on the patient's compliance with micronutrient supplements, amount of weight loss, pre-existing nutritional status, eating habits, measurement techniques, quality and length of follow-up, and type of bariatric procedure. After surgery, deficiencies can appear or worsen in as many as 60% of patients at 6 months and 100% of patients at 2 years. Due to this, nutritional post-bariatric efforts seem to be underrecognized, misunderstood, and underappreciated⁵.

Treatment of nutrition deficiencies should begin before surgery in morbidly obese bariatric surgery patients since it is a challenging problem both pre- and postoperatively. Adequate and proper nutrition care and eating habit change are two of the most crucial parts of post-bariatric follow-up. If patients receive multivitamin supplements, macroelements, and

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Table 1. Recommendations for macronutrients and micronutrients monitoring and supplementation after MBS

Macro and Micronutrient	Monitoring/Supplementation
Proteins	At least 60 g of protein daily (up to 0.8-1.2 g/kg of body weight), during periods of active weight reduction.
Vitamin A	Follow-up at post-operative months 1, 3, 6, and 12 and then once a year after RYGB, if necessary (e.g., signs of post-operative protein deficiency). Dose: 5000-10,000 IU/day
Vitamin D	Evaluate at months 1, 3, 6, and 12 following surgery, then every year. Dose: 3000 IU of Vitamin D daily from all sources to maintain a level over 30 ng/mL.
Vitamin E, K	Monitor at post-operative month 12 after RYGB and when clinically indicated. Dose: 15 mg of Vitamin E per day (19 mg in lactating patients); 90-120 mcg of Vitamin K daily.
Vitamin B12	Monitor B12, methylmalonic acid, with or without homocysteine at post-operative months 3, 6, and 12. Dose: 500-1000 mcg/day orally or 1000 mcg every month intramuscularly.
Vitamin B1	Monitor if clinically indicated (encephalopathy and ataxia) or risks are present (alcohol misuse or emesis). Dose: 50-100 mg daily.
Iron	Follow-up at post-operative months 1, 3, 6, and 12, then annually. Dose: 18 mg/d for men and women aged ≥ 51 years; 45-60 mg/d for women aged < 51 years.
Folate	Monitor if there is macrocytic anemia or mild pancytopenia. Dose: 400-800 mcg; 800-1000 mcg for women of childbearing age.
Zinc	Monitor levels if there is chronic diarrhea or dermatitis. Dose: 11 mg/d for men; 8 mg daily for women.
Copper	Monitor if clinically indicated (myeloneuropathy). Dose: 1 mg of copper per 8-15 mg of zinc per day to prevent copper deficiency.
Selenium	Monitor if there is skeletal muscle dysfunction or cardiomyopathy. Dose: 100 mcg daily.

MBS: metabolic and bariatric surgery; RYGB: roux-en-Y gastric bypass.

microelements on a regular basis, in addition to being regularly monitored, severe nutrition shortages can be avoided. Although effective collaboration between surgeons, internists, psychiatrists, and dietitians is necessary for multidisciplinary supervision, the patient is the key player in the fight against malnutrition,

weight gain, and other consequences following bariatric surgery.

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Conflicts of interest

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Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

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