Medical Monitoring of the Bariatric Patient

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Nutritional deficiencies are a danger after all types of weight loss surgery. Risk varies with the procedure, none are immune. Patients and physicians may downplay the role of post-operative nutrition and vitamin supplementation. Unmonitored deficiencies can leave patients vulnerable to acute and chronic conditions with permanent physical damage.

Pre-operative considerations

- Obese patients may be over fed, but generally are not over-nourished.
- Obesity creates nutritional demands that are beyond the normal daily requirements on which the daily reference rations are based.
- Pre-op patients are most commonly deficient in thiamine (B1) and vitamin D.
- MVI, D3 5000 IU, Calcium citrate 1500mg, and B complex are recommended daily prior to surgery.

Nutritional Supplementation: General guidelines

- No gummies!
- Chewable or liquid best
- Multivitamin needs to contain iron
- Weight loss surgery patients are dependent on B12 supplementation indefinitely, and it should not be discontinued because levels are normal or high.
- Weight loss surgery patients are susceptible to small intestine bacteria overgrowth, which may effect vitamin/nutrient absorption.

A Few Facts About B12

- B12 once ingested must to bind to the Intrinsic Factor protein complex to be absorbed.
- IF is secreted by parietal cells in fundus and body of stomach.
- Optimum pH for IF activity is 7.
- B12 unites with IF in higher pH duodenum and then absorbed in proximal ileum.
- Weight loss surgeries remove stomach’s parietal cells or bypass place of absorption in small intestine, which is why B12 cannot be replaced through the GI tract.

RYGB - supplementation

- 2 Multivitamins with iron
- 2000 IU Vitamin D3
- 1500 mg Calcium Citrate divided tid
- B1 100mg daily for first year, then weekly.
- B12 1000mcg SL daily or IM monthly, or 500 mcg intranasal weekly.
- Probiotic, 10 billion CFU or more, containing *bifidobacteria* species.
**RYGB – lab monitoring**
- CMP
- CBC with differential
- Ferritin
- Vitamin A
- 25-OH Vitamin D
- Thiamine
- B12
- RBC folate
- PTH
- Prealbumin

**RYGB – Common Deficiencies**
- Thiamine acutely, especially if vomiting
- Iron – especially females
- Vitamin D
- B12 – proximal ileum bypassed and little to no exposure to Intrinsic Factor
- Ferritin (anything <40 can cause hair loss, <20 = little to no iron storage in marrow)
- Vitamin A (corrected to protein, take with meal and fat containing foods)
- ↑ RBC folate (sometimes responds to correcting B12, sometimes not)
- Zinc
- Protein

**Sleeve Gastrectomy – Supplementation**
- 2 Multivitamins with iron
- 2000 IU Vitamin D3
- 1500 mg Calcium Citrate divided tid
- B1 100mg daily for first year, then weekly
- B12 1000mcg SL daily or IM monthly, or 500 mcg intranasal weekly
- Probiotic, 10 billion CFU or more, containing *bifidobacteria* species

*Same as RYGB regimen

**Sleeve Gastrectomy – Labs**
- CMP
- CBC with differential
- Ferritin
- Vitamin A
- 25-OH Vitamin D
- Thiamine
- B12
- RBC folate
- PTH
- Prealbumin

* Same as RYGB

**Sleeve Gastrectomy – Common Deficiencies**
- B12 – virtually no intrinsic factor at all!
- Vitamin D
- Iron
- Folate
- Protein

**Adjustable Gastric Band – supplementation**
- Multivitamin
- Calcium 1000-1200 mg divided bid
- 2000 IU D3
- B1 100 mg weekly
Adjustable Gastric Band - Labs
- CMP
- CBC
- B1
- RBC Folate
- Pre-albumin
- Ferritin
- B12
- 25-OH vitamin D

Adjustable Gastric Band – Common Deficiencies
- Thiamine (more vomiting, less breads)
- Vitamin D
- B12
- Protein
- Zinc

* Intolerance to eating meat contributes to low B12 & zinc

Duodenal Switch - supplementation
- 4 Multivitamins with iron
- 2000-2400 mg Calcium Citrate, divided
- 5000 IU Vitamin D3
- B12 1000 mcg SL daily, 500 mcg intranasal weekly, or 1000 mcg IM monthly (titrate to level > 500)
- B complex (containing B1) daily
- Iron for menstruating women
- Probiotic

Duodenal Switch - Labs
- RYGB panel plus:
  - Copper
  - Zinc
  - Vitamin K
  - B6

Duodenal Switch – Common Deficiencies
- Everything!
- Protein levels can get very low and be difficult to correct
- D3 and vitamin A can inhibit one another with supplementation
- B vitamins can be erratic, high and low B12, B6, and RBC folate
- Copper and zinc inhibit one another, 1 mg copper supplemented for each 8-15 mg zinc
- Generally oral replacement doses are much higher than for other surgeries
- IV replacement sometimes needed for multivitamin, iron, copper, B6

Common Symptoms – Deficiencies
- Mouth sores – B vitamins
- Fatigue – fluids, protein, B12, iron, D3
- Hair loss – iron, zinc, protein
- Skin issues – vit A, zinc, copper, vit C
- Bruising – iron, vit C, zinc, vit K
- Constipation – fluids, fiber, SIBO
- Diarrhea – folic acid, copper, protein malnutrition
- Neuropathy – B12, thiamine, B6, niacin, copper (can look just like B12 def), B5, vit E
Medical Monitoring of Bariatric Patient - Conclusions

- Labs need to be done yearly
- Vitamin supplementation is life long
- B12 can no longer be absorbed through GI tract except in AGB patients
- B12 levels need to be >500 and ferritin levels ≥ 20 despite lab normal reference ranges
- Probiotic use is good rule of thumb
- If several deficiencies are present, refer back to center where RD’s can oversee replacement of nutrients