Medication Considerations for the Bariatric Surgery Patient

Karen C. Downer, Pharm.D.
PGY1 Pharmacy Practice Resident
Ralph H. Johnson
VA Medical Center
Charleston, SC
karen.downer2@va.gov
March 25, 2012

Disclosure Statement

Neither I, nor any member of my immediate family, has a relevant financial relationship or interest with any proprietary entity producing health care goods or services.

Objectives

- Differentiate between the most common bariatric surgical procedures & clinical considerations for each type
- List the recommended nutrient supplementation and specific drug therapy considerations for bariatric surgery patients

Obesity – An American Epidemic

Percentage of Obese Adults (3-year average from 2007-09 CDC Behavioral Risk Factor Surveillance System data)

An Established Treatment Option

- National Institutes of Health (1991)
  - BMI >40 kg/m²
  - BMI >35 kg/m² + comorbidities
- Endorsed by:
  - Private Insurance
  - Medicare, VA, Dept. of Defense
  - American Diabetes Association
  - The Obesity Society
  - American Association of Clinical Endocrinologists
  - American Society for Metabolic & Bariatric Surgery

Exponential Growth

Annual Number of Bariatric Surgeries in U.S.

- Trained Surgeons
- Skilled Facilities
- “Quick Fix” Society
- Advertising
- Proven Treatment
**Benefits of Bariatric Surgery**

- Weight loss >50% excess body weight
- Reduced long-term medical costs
- Reduced medication burden
- Improved quality of life
- Improvement in long-term mortality
  - 56% decrease death due to coronary artery disease
  - 95% decrease death due to diabetes
- “Cure” of chronic diseases

**American Joe – Before Surgery**

- Diabetes
- Hypertension
- Dyslipidemia
- Sleep Apnea
- GERD
- Osteoarthritis
- Gout
- Depression

**American Joe – After Surgery**

- Diabetes: 83% resolved
- Hypertension: 52-92% resolved
- Dyslipidemia: 63% resolved
- Sleep Apnea: 74-98% resolved
- GERD: 72-98% resolved
- Osteoarthritis: 44-88% resolved
- Gout: 77% resolved
- Depression: 55% resolved

**What are American Joe’s Options?**

- **Adjustable Gastric Band**
  - Restrictive only
    - Nutrient deficiencies rare
    - Reduced medication absorption rare
  - Weight loss
    - 40-50% excess body weight
    - 300 lb person → 75 lb weight loss
    - Slower weight loss, up to 36 months
  - Most Common Complications
    - Slippage (24%)
    - Stomach band outlet blockage (14%)
    - Port problem (9%)
Roux-en-Y Gastric Bypass

- Restrictive & Malabsorptive
  - Nutrient deficiencies common
  - Reduced medication absorption likely
- Weight Loss
  - 60-70% excess body weight
  - 300 lb person → 105 lb weight loss
  - Rapid first 6 months, up-to 18 months
- Most Common Complications
  - Stomal Stenosis (16%)
  - Stomal Ulcer (13%)

85% of U.S. Bariatic Surgeries!

Nutrient Deficiencies

- 50% occur in the first year
- Most common
  - Calcium, Vitamin D → Osteoporosis
  - Vitamin B12, Iron → Anemia
- Monitoring
  - Every 3-6 months for first 2 years
  - Annually for life

Predictable, Preventable, Treatable

Guideline Recommendations

<table>
<thead>
<tr>
<th>Vitamin/Supplement</th>
<th>Prevention Daily Dose</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multivitamin</td>
<td>1-2 daily</td>
<td>Chewable post-surgery (30-days) Should contain: - 400 µg folate (prenatal) - thiamine - fat solubles (A,D,E,K) - 100% Rec. Daily Intake (RDI)</td>
</tr>
<tr>
<td>Calcium</td>
<td>1200-2000 mg</td>
<td>Calcium citrate preferred 3-4 divided doses</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>400-800 IU</td>
<td></td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>200-500 µg oral 1000 µg/month IM</td>
<td>Oral as effective as IM</td>
</tr>
<tr>
<td>Iron</td>
<td>40-65 mg (menstruating women)</td>
<td>Vitamin C helps absorption Separate from calcium by 2 hours</td>
</tr>
</tbody>
</table>

American Joe’s Prescription - Look Appropriate?

- Meets 100% RDI
- Contains folate, thiamine, & fat solubles
- Citrate preferred
- 1200-2000 mg Calcium
- 3-4 divided doses
- Vitamin D
- ≥ 350 mcg/day
**Known Medication Considerations**

<table>
<thead>
<tr>
<th>Drugs to Avoid</th>
<th>Class/Examples</th>
<th>Suggestions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Limited absorption</strong></td>
<td><strong>Diabetes resolution is RAPID</strong></td>
<td>Monitor, Monitor, Monitor</td>
</tr>
<tr>
<td><strong>Diabetes medications</strong></td>
<td><strong>Diabetes Drug Use</strong></td>
<td>Monitor, Monitor, Monitor</td>
</tr>
<tr>
<td><strong>Hypertension medications</strong></td>
<td><strong>most patients</strong></td>
<td>Monitor, Monitor, Monitor</td>
</tr>
<tr>
<td><strong>Osteoporosis medications</strong></td>
<td><strong>Risk of fracture</strong></td>
<td>Monitor, Monitor, Monitor</td>
</tr>
<tr>
<td><strong>Pill size</strong></td>
<td><strong>Switch to alternative formulation</strong></td>
<td>Monitor, Monitor, Monitor</td>
</tr>
<tr>
<td><strong>Pill dissolution</strong></td>
<td><strong>Drug to alternative formulation</strong></td>
<td>Monitor, Monitor, Monitor</td>
</tr>
</tbody>
</table>

**Pearls**

- Quality guidance is almost non-existent
- Generally, decreased efficacy vs. increased toxicity
- Start with what you know
  - Type of procedure: Restriction +/- Malabsorption
  - Known formulation & toxicity concerns
  - Chronic diseases can resolve quickly
  - Nutrient deficiencies are common
- Everything else - Monitor closely
  - Warfarin, digoxin, insulin, oral contraceptives, antiepileptics
  - Case reports & your clinical brain

**Case Reports**

- Three review articles
  - Padwal R, et al. (Jan 2010)
  - Lawrecki T. (Mar 2011)

- Evidence of decreased absorption

<table>
<thead>
<tr>
<th>Multiple Reports</th>
<th>Single Report</th>
<th>Conflicting Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclosporine</td>
<td>Amoxicillin</td>
<td>Atorvastatin</td>
</tr>
<tr>
<td>Tacrolimus</td>
<td>Ethosulfamide</td>
<td>Chlortromycin</td>
</tr>
<tr>
<td>Mycophenolic acid</td>
<td>Pentamidine</td>
<td>Diclofen</td>
</tr>
<tr>
<td>Phenytoin</td>
<td>Fluocinol</td>
<td>Oral contraceptives</td>
</tr>
<tr>
<td>Mycophenolic acid</td>
<td>Neomycin</td>
<td></td>
</tr>
<tr>
<td>Digoxin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspirin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metformin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paracetamol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paracetamol</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**American Joe, “Glad I have my hospital pharmacist!”**

<table>
<thead>
<tr>
<th>Previous Home Regimen</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>Metformin 1000 mg daily</td>
</tr>
<tr>
<td></td>
<td>Glipizide 10 mg BID</td>
</tr>
<tr>
<td></td>
<td>Insulin glargine 60 units qhs</td>
</tr>
<tr>
<td></td>
<td>Insulin aspart 20 units TID</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Lisinopril 40 mg daily</td>
</tr>
<tr>
<td></td>
<td>Metoprolol XL 50 mg daily</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>Gemfibrozil 600 mg BID</td>
</tr>
<tr>
<td>GERD</td>
<td>Omeprazole 20 mg BID</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>Ibuprofen 800 mg TID</td>
</tr>
<tr>
<td>Depression</td>
<td>Bupropion XL 150 mg daily</td>
</tr>
<tr>
<td>Health Maint</td>
<td>Aspirin 81 mg daily</td>
</tr>
<tr>
<td></td>
<td>Adult Gummy MVI daily</td>
</tr>
<tr>
<td></td>
<td>Pseudoephedrine (12-hr)</td>
</tr>
</tbody>
</table>
American Joe’s New Medication Profile

<table>
<thead>
<tr>
<th>Previous Regimen</th>
<th>New Regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metformin 2000 mg daily</td>
<td>Metformin SR 1500 mg TID</td>
</tr>
<tr>
<td>Glipizide 10 mg BID</td>
<td>Glipizide 5 mg BID</td>
</tr>
<tr>
<td>Insulin glargine 20 units qhs</td>
<td>Insulin glargine 10 units BID</td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
</tr>
<tr>
<td>Lisinopril 40 mg daily</td>
<td>(\text{not applicable})</td>
</tr>
<tr>
<td>Metoprolol XL 50 mg daily</td>
<td>(\text{not applicable})</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td></td>
</tr>
<tr>
<td>Gemfibrozil 600 mg BID</td>
<td>(\text{not applicable})</td>
</tr>
<tr>
<td>Omeprazole 20 mg BID</td>
<td>(\text{not applicable})</td>
</tr>
<tr>
<td>Diabetes Medication</td>
<td></td>
</tr>
<tr>
<td>Ibuprofen 800 mg BID</td>
<td>(\text{not applicable})</td>
</tr>
<tr>
<td>Bupropion XL 150 mg daily</td>
<td>(\text{not applicable})</td>
</tr>
<tr>
<td>Health Maint</td>
<td>Aspirin 81 mg daily</td>
</tr>
<tr>
<td></td>
<td>Adult Gummy MVI daily</td>
</tr>
<tr>
<td></td>
<td>Pseudoephedrine (12-hr)</td>
</tr>
</tbody>
</table>

References


References


Images & Videos: