Antidepressants after Bariatric Surgery: A Case Report and Literature Review

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INTRODUCTION

• 1.6 billion people worldwide are obese with 2.5 million deaths annually.
• Healthcare spending in the United States for obesity has surpassed $100 billion annually.
• 228,000 bariatric surgeries were performed in the United States in 2017.
• 20-50% of patients undergoing bariatric surgery in the United States have a history of a mood disorder.
• Studies have shown as high as 35% of bariatric surgery candidates were taking antidepressants.
• Unlike medications for diabetes, hypertension, or hyperlipidemia, which are usually discontinued post bariatric surgery, antidepressant medication use has been found to only decrease by 9% one year after bariatric surgery.

OBJECTIVES

• Describe a case of major depressive disorder in a patient with history of roux-en-y gastric (RYGB) procedure.
• Briefly review types of bariatric surgeries.
• Review the literature for antidepressant efficacy in patients status post bariatric surgery, with focus on selective serotonin reuptake inhibitors (SSRI) and serotonin-norepinephrine reuptake inhibitors (SNRI).
• Review the evidence for transitioning to immediate release formulations when available.

CASE

• 62 year old female with history of MDD and GAD who was status post RYGB with past medical history significant for hypertension, fibromyalgia, irritable bowel syndrome and migraines.
• Present to outpatient psychiatry residency clinic with worsening depression and anxiety.
• Medications included duloxetine 60mg daily, buproprion XL 300mg daily, clonazepam 1mg nightly and 0.5mg daily PRN anxiety, topiramate 50mg daily, tramadol 50mg daily PRN pain, pantoprazole 20mg BID, estradiol 50mg daily PRN anxiety, Bupropion extended release 150mg BID, pantoprazole 20mg BID, estradiol 50mg daily.
• Initial concern for decreased absorption of duloxetine 60mg daily, bupropion 150mg and clonazepam 0.5mg BID.
• bupropion XL was discontinued due to lack of evidence for switching to IR or SR formulations.
• Follow up 4 weeks later revealed improvement in depression and anxiety symptoms. Further follow up has continued to reveal improved symptoms of depression and anxiety since increase in duloxetine, furthering our hypothesis that absorption of duloxetine was poor.
• Literature review was conducted through PubMed and EMBASE for terms “bariatric surgery”, “gastric bypass”, “SSRI”, “SNRI”, “antidepressants”, and “anti-depressants”.
• There were 11 publications that looked at antidepressant use after bariatric surgery.
• The majority of publications focused on antidepressant use (mainly SSRI and SNRI) after RYGB.
• Though majority of research to date is on RYGB procedure, current trends in bariatric surgery show that the most common procedure in 2017 was sleeve gastrectomy, with 59.39% of procedures using this technique.
• Each procedure type (RYGB, gastric band, sleeve gastrectomy) affects various mechanisms of both pharmacokinetics and pharmacodynamics of medications.
• Table 2 references the effects that each of the three most common bariatric surgery techniques have on various mechanisms of absorption.
• Research is limited on specific antidepressants but Table 3 highlights the data found for common SSRI and SNRIs.

DISCUSSION

• Despite the increase in bariatric surgeries, there are no specific guidelines for treatment of psychiatric patients post surgery.
• Given the documented link between obesity and psychiatric disorders, close follow up by a psychiatric provider would likely be beneficial for patients, especially those currently on antidepressant medications.
• Each type of bariatric surgery presents different effects on the metabolism of antidepressants and thus requires considerations about bioavailability and its impact on side effect profiles, especially antidepressants with high propensity for discontinuation syndromes.
• Most of the literature to date is based off of RYGB, but there has been a decrease in RYGB and increase in both gastric sleeve and gastric band; therefore further studies are needed.
• Some recommendations include use of liquid formulations for at least 2-3 minutes or crushing or opening up pills, if possible, to help with bioavailability.
• Though a common clinical practice, there is no clear evidence to support switching from extended release formulations to immediate release following bariatric surgery.
• Patients undergoing bariatric surgery are at increased risk for depression and suicide, so close follow up by psychiatry for at least a one year period would be beneficial.
• Therapeutic drug monitoring could play an important role moving forward, specifically in the first month to 12 months after bariatric surgery.
• In summary, further research of psychiatric patients status post bariatric surgery is needed to determine guidelines for treatment.

REFERENCES


Table 1: 2015-2017 percentage estimates of bariatric surgery (ASMSB)

<table>
<thead>
<tr>
<th>Type</th>
<th>2015 Estimate</th>
<th>2016 Estimate</th>
<th>2017 Estimate</th>
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<tbody>
<tr>
<td>Sleeve</td>
<td>58.1%</td>
<td>58.1%</td>
<td>59.39%</td>
</tr>
<tr>
<td>RYGB</td>
<td>3.27%</td>
<td>2.77%</td>
<td></td>
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<tr>
<td>Gastric Band</td>
<td>3.39%</td>
<td>3.39%</td>
<td>2.77%</td>
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</tbody>
</table>

Table 2: Effects of bariatric surgery on mechanisms of absorption of oral medications

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>RYGB</th>
<th>Gastric Band</th>
<th>Sleeve Gastroctomy</th>
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<tbody>
<tr>
<td>Reduced gastric acidity</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Diminished intestinal surface area</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>Gastric emptying</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>Gastric motility</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>Rapid weight loss (J)</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>Changes in CYP3A4 (3A4 and 3A5 found in upper SI)</td>
<td>X</td>
<td>X</td>
<td></td>
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</tbody>
</table>

Table 3: Summary of available literature on antidepressant bioavailability after bariatric surgery

<table>
<thead>
<tr>
<th>Study</th>
<th>Medications</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamad et al.</td>
<td>Multiple Medications</td>
<td>6/12 showed that AUC dropped an average of 54% at 1 month</td>
</tr>
<tr>
<td>Marinko et al.</td>
<td>esiclopram</td>
<td>35% reduction at 2 weeks and further 16-19% reduction by week 6</td>
</tr>
<tr>
<td>Roeri et al.</td>
<td>sertraline</td>
<td>Levels were lower post surgery (bariatric 124.4 ng/ml/hour vs control 314.8ng/ml/hour)</td>
</tr>
<tr>
<td>Roeri et al.</td>
<td>duloxetine</td>
<td>Levels were lower post surgery (bariatric 66.47 ng/ml/hour vs control 119.9 ng/ml/hour)</td>
</tr>
<tr>
<td>Krieger et al.</td>
<td>venlafaxine XR</td>
<td>AUC was similar before and after surgery</td>
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