Obesity: Complications in Pregnancy and Special Considerations Following Bariatric Surgery

Katherine Jacobs, DO
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Maternal Outcomes Matter
10/12/12
Learning Objectives

1) Define categories of body mass index (BMI)

2) Understand the Institute of Medicine (IOM) guidelines on gestational weight gain

3) Understand the maternal and fetal implications of obesity in pregnancy
Learning Objectives

• 4) Identify the most common bariatric procedures

• 5) Identify psychological factors to consider during pregnancy

• 6) Understand the unique implications of bariatric surgery on pregnancy
Obesity and the Impact on Pregnancy: Maternal and Fetal Complications

Katherine Jacobs, DO
The State of Our Nation

- Obesity is an epidemic
  - “F as in Fat” Report
  - Robert Wood Johnson Foundation report projects that 50% of U.S. adults will be obese by 2030
  - Obesity now affects 17% of children and adolescents in the US
  - Students consume almost 400 Billion calories from junk food sold in our schools
  - Obesity is the most expensive public health issue
    - $190 billion spent annually
Childhood Obesity

CDC 2011 data, low income children aged 2-4
The State of Our Nation

• 66% of US Adults are overweight or obese
  – 30% of reproductive aged women (20-39) are obese!

• 2\textsuperscript{nd} leading cause of preventable death
  – Primarily through effects on CV disease risk factors

• In the past decade obesity rates have increased dramatically
  – 30 states report a prevalence of 25%
Adult Obesity

[Map showing obesity rates by state, with data from CDC 2010]
Worldwide Adult Obesity

The Global Obesity Problem

An obese adult is classified as having a Body Mass Index equal to or greater than 30

Source: World Health Organization, 2005
Obesity Epidemic
Definitions
BMI = weight (kg)/height (m²)

To calculate BMI go to www.nhlbisupport.com/bmi/
Definitions

• BMI Categories
  - Normal weight BMI 18.5-24.9
  - Overweight BMI 25-29.9
  - Obesity BMI >30
    ▪ Class I obesity BMI 30-34.9
    ▪ Class II obesity BMI 35-39.9
    ▪ Class III obesity BMI >/= 40
  - Morbid Obesity
    ▪ Class III without co-morbidities
    ▪ Class II with co-morbidities
Obesity and Race Disparity

- Non-Hispanic Black Women (49%)
- Mexican-American Women (38%)
- Non-Hispanic White Women (31%)
Stratify Risk

• High Risk Category
  – Pre-pregnancy BMI of $\geq 30$
  – Weight of 200lbs or more

• 70% increase in pre-pregnancy obesity from 1994 to 2003.
  – The incidence of obesity among pregnant women in the US ranges from 18.5% to over 38%
Institute of Medicine Guidelines on Gestational Weight Gain

- Consensus conference in 2009
  - Prior weight gain guidelines were set in 1990
  - The new guidelines are based on WHO BMI categories rather than Metropolitan Life Insurance tables
  - There is a specific and NARROW range of recommended weight gain for obese women
  - Excessive weight gain in pregnancy is associated with persistent weight retention afterwards
# Recommendations for total and rate of weight gain during pregnancy, by pre-pregnancy BMI (Singletons)

<table>
<thead>
<tr>
<th>Pre-preg BMI</th>
<th>BMI (kg/m²) WHO</th>
<th>Total Weight Gain Range (lbs)</th>
<th>Rates of Weight Gain 2&lt;sup&gt;nd&lt;/sup&gt; &amp; 3&lt;sup&gt;rd&lt;/sup&gt; Trimester (mean range lbs/week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
<td>28-40</td>
<td>1 (1-1.3)</td>
</tr>
<tr>
<td>Normal Weight</td>
<td>18.5-24.9</td>
<td>25-35</td>
<td>1 (0.8-1)</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0-29.9</td>
<td>15-25</td>
<td>0.6 (0.5-0.7)</td>
</tr>
<tr>
<td><strong>Obese (includes all classes)</strong></td>
<td>&gt;/=30.0</td>
<td>11-20</td>
<td>0.5 (0.4-0.6)</td>
</tr>
</tbody>
</table>
Recommendations for total weight gain during pregnancy (Twins)

<table>
<thead>
<tr>
<th>Pre-pregnancy BMI</th>
<th>BMI WHO</th>
<th>Total Weight Gain Range (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>18.5-24.9</td>
<td>37-54</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0-29.9</td>
<td>31-50</td>
</tr>
<tr>
<td>Obese</td>
<td>&gt;/= 30.0</td>
<td>25-42</td>
</tr>
</tbody>
</table>
How can we help women meet the new weight gain goals during pregnancy?

• Let women know about the IOM guidelines
• Women should be in the normal BMI range when they conceive
• Preconception counseling
• Guidance on dietary intake
• Guidance on physical activity
• Record weight at each visit and share this information with the patient
• Individualized attention
Preconception and 1st Trimester Obstetric Risks

• Increased risk of infertility
• Increased risk of early miscarriage
  – OR 1.2
• Increased risk of recurrent miscarriage
  – OR 3.5
• Risk remains increased for both spontaneous and IVF pregnancies

• WEIGHT LOSS is KEY preconception component in these patients
Maternal Obstetric Complications

• Obesity affects virtually every organ system
Maternal Obstetric Complications

• Hypertensive disorders
• Gestational hypertension
  – Class I Obesity OR 2.5
  – Class II Obesity OR 3.2
• Preeclampsia
  – Class I Obesity OR 1.6
  – Class II Obesity OR 3.3
Maternal Obstetric Complications

• Coronary Artery Disease
• Diabetes Mellitus
  – Gestational Diabetes, A1 or A2
    ▪ Class I Obesity OR 2.6
    ▪ Class II Obesity OR 4.0
  – Pre-gestational Diabetes (type II diabetes)
Maternal Obstetric Complications

• Cesarean Delivery
  – Class I Obesity 33.8%
  – Class II Obesity 47.7%

• VBAC is less successful with increasing BMI
  – 54.6% in obese vs 70.5% controls

• 18% of maternal deaths related to obesity
  – Likely an underestimation
  – ½ of pregnancy-associated deaths in the UK are obesity related
Maternal Obstetric Complications

• Operative Vaginal Delivery
  – OR 1.7

• Increased risk of PPH

• No increase in rates of PPROM, IUGR, placenta previa or placental abruption
Maternal Obstetric Complications

- Obese patients are more likely …
  - To be admitted earlier in labor
  - To need labor induction
  - To require more oxytocin
  - To have longer labor
Maternal Obstetric Complications

• Inability to obtain interpretable external fetal heart rate and uterine contraction patterns

• Difficulty in performing an emergent cesarean delivery
Maternal Complications- Cesarean Section

- **OR resources**
  - Large operating table
  - Extra personnel

- **Anesthesia Challenges**
  - Difficult regional anesthesia
  - Difficult airway leading to respiratory events
  - Sleep apnea

- **Prophylactic Antibiotics**
  - Dosing?
Maternal Complications- Cesarean Section

- Placement of incision
  - No RCT demonstrating benefit of vertical vs Pfannenstiel incision- individualize
- Increased operative time
- Increased EBL
- Increased infectious morbidity (wound, endometritis)
- Increase incidence of DVT
Maternal Complications- Post Operative

- Subcutaneous layer closure
  - Decreased incidence of postoperative wound disruption
- Subcutaneous drains
  - Not consistently shown to reduce postoperative morbidity
- Sequential compression devices, hydration, and early mobilization
  - Decrease the risk of VTE
- Consider prophylactic heparin for high risk women
  - Data are insufficient to determine whether the benefits outweigh the risks
Fetal Complications

- Fetal macrosomia
  - OR 2.0-2.4

- Shoulder dystocia
  - 3 x increased risk

- IUFD
  - 2-3 x increased risk
Fetal Complications

• IUFD
  – Increased risk is present independent of underlying comorbidities
  – Most highly correlated with pre-gravid weight, not pregnancy weight gain
  – Pathophysiology unexplained, but historic data describe placental dysfunction
  – Benefit of antenatal testing not determined
Fetal Complications

• Increased risk of congenital anomalies
  – NTD OR 1.8
  – Heart defects OR 1.18
  – Omphalocele OR 3.3
Fetal Complications

• Large BMI impairs visualization of ultrasound images and can compromise prenatal diagnosis of fetal anomalies
  – 14% decrease in visualization when BMI >36
  – 40% unable to see complete anatomy when BMI >97.5%ile
    ▪ Cardiac anatomy
    ▪ Fetal spine
  – Minimal improvement with repeat examination in morbidly obese
Anterior Abdominal Wall Depth
Maternal Obesity

A

B

C
Recommendations

• Pre-conceptional
  − Encourage weight loss before pregnancy
  − Identify obesity and classify based on BMI
  − Obtain medical history and screen for hypertension and diabetes
  − Nutrition consult and exercise regimen
  − Consider cardiology evaluation if BMI >35, pre-existing DM or hypertension
  − Discuss possible complications (SAB, congenital anomalies, GDM, GH, IUFD, C/S)
Recommendations

• First Trimester
  - GCT and repeat at 24-28 weeks if normal
  - Screen for hypertension if not done preconception
  - Early ultrasound to confirm dating
  - Discuss optimal weight gain using IOM guidelines
  - Discuss possible pregnancy complications
Recommendations

• Second and Third Trimester
  – Ultrasound for anatomy screening (wait until >18 weeks)
  – Explain limitations of ultrasound based on body habitus
  – Consider antenatal testing as a result of increased risk of stillbirth
    ▪ Kick counts, benefit of more expensive monitoring unknown
  – Anesthesia consult
  – Discuss intrapartum limitations
    ▪ EFM
    ▪ Emergent C/S
    ▪ EFW
Recommendations

• Labor and Delivery
  – Anesthesia consult early in labor
  – Review incision options if cesarean delivery planned or anticipated
  – Anticipate increased blood loss
  – Awareness of increased incidence of shoulder dystocia
Obesity: pregnancy following bariatric surgery

Lisa Bowman, CNM
Common Types of Bariatric Surgery

Malabsorptive and restrictive

• Roux–en-Y gastric bypass
• Duodenal Switch

Restrictive

• Laparoscopic Adjustable Band
• Sleeve Gastrectomy
Standard Roux-en-Y Gastric bypass
Doudenal Switch
Laparoscopic Adjustable band
Sleeve Gastrectomy
Psychological Factors to consider following bariatric surgery

• Concern about weight gain in pregnancy, too much or not enough
• Concern about fetal well being, too large or too small
• Concern about the ability to have a vaginal delivery
• Concern about the ability to breast feed
• Concern about menu choices while hospitalized
Do we treat these women any differently in pregnancy?

Yes

and no!
Laparoscopic Adjustable band

Pregnant women should Have their band loosened. This prevents band slippage

If this patient reports reflux: Send them directly to their Bariatric surgeon for a Full work-up

This patient CAN have routine 1hr glucose tolerance test
Standard Roux-en-Y Gastric bypass

This patient does need additional Lab work at initial prenatal visit

This patient does need additional Micronutrient supplements

This patient SHOULD NOT undergo The standard 1hr glucose tolerance Testing, as dumping syndrome might Occur.
Standard Roux-en-Y: Dumping Syndrome

Occurs after ingestion of high amounts of refined sugars or fats.

It is the result of the hyperosmolar environment that causes a fluid shift from the circulatory system into the small bowel.

Patients often feel abdominal cramping, nausea and vomiting and diarrhea.

This may also be associated with heart palpitations, tachycardia and diaphoresis.

Source: Up to Date Counseling women about fertility and pregnancy after bariatric surgery
Standard Roux-en-Y lab considerations

- In addition to routine prenatal labs the provider should consider the following:

  Ferritin
  Iron
  Vitamin B12
  Thiamine
  Folate
  Calcium
  Vitamin D
  Hemoglobin A1C

Source: Up to Date Counseling women about fertility and pregnancy after bariatric surgery
Standard Roux-en-Y Micronutrient supplement recommendations:

Patient’s should be encouraged to switch from a multivitamin to a prenatal vitamin, if they can swallow them. They could consider a children’s chewable multivitamin with iron.

Vitamin B12 sublingual 500-1000mcg daily
Ferrous Fumerate iron daily
Calcium 1200mg daily
Vitamin D 4000 IU daily

**remind them not to take their calcium with iron supplement**
How do we screen for diabetes in a patient who has had Roux-en-Y gastric bypass?

• Issue glucometer, have patient check fasting blood sugars daily for one week. Followed by 2hr post-prandial blood sugars after morning meal.

• Consider fasting glucose, instruct patient to go eat a carbohydrate dense meal and return to lab in 2 hours for post-prandial level.

Source: Up to Date Counseling women about fertility and pregnancy after bariatric surgery
The bariatric patient: any additional considerations....

- Current literature does not support additional antenatal surveillance.
- Current literature does not indicate need for cesarean delivery, but should be based on standard care.
- Bariatric patient’s who have significantly lowered their pre-surgical BMI, have better pregnancy outcomes than obese patients.
Obesity, what can we do?

• Talk to your patient respectfully about their BMI
• Address healthy weight management at annual exams
• Offer resources to help i.e., web applications and free online resources, walking clubs, support groups
• Refer patient to dietician or to structured weight loss programs
• Refer patient to bariatric surgeon if motivated
Thank you!

Questions?

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