Obstetric Management of Obese Women

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Trends in Obesity (BMI ≥ 30) Among Women 20-39


Prevalence of Class 2 and Class 3 Obesity for Women ages 20-39, 2007-2008

Class I Obesity – BMI 30 – 34.9
5’4” woman who weighs 175 lbs has BMI = 30

Class II Obesity – BMI 35 – 39.9
5’4” woman who weighs 205 lbs has BMI = 35

Class III Obesity – BMI ≥ 40
5’4” woman who weighs 235 lbs has BMI = 40

Etiology of Obesity

- Genetics & Fetal Programming
- Environment
- Behavior/Psychology

High BMI is a marker for metabolic dysfunction

- Obesity is a state of chronic inflammation
- May explain association between obesity and preeclampsia, diabetes
- Other components of metabolic syndrome: Blood pressure, insulin resistance, hyperlipidemia
- NASH/fatty liver
Maternal Systemic Inflammation in Obesity

<table>
<thead>
<tr>
<th></th>
<th>Lean n = 53</th>
<th>Obese n = 68</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-gravid BMI</td>
<td>22.0 ± 1.9</td>
<td>38.4 ± 6.3</td>
<td></td>
</tr>
<tr>
<td>Plasma insulin (µU/ml)</td>
<td>11.8 ± 5.6</td>
<td>26.0 ± 14.6</td>
<td>0.0001</td>
</tr>
<tr>
<td>Plasma glucose (mg/dl)</td>
<td>74 ± 7</td>
<td>79 ± 11</td>
<td>0.0001</td>
</tr>
<tr>
<td>Adiponectin (µg/ml)</td>
<td>10.7 ± 4.6</td>
<td>9.7 ± 4.0</td>
<td>ns</td>
</tr>
<tr>
<td>Leptin (ng/ml)</td>
<td>31.9 ± 20</td>
<td>72.1 ± 34.7</td>
<td>0.0001</td>
</tr>
<tr>
<td>IL-6 (ng/ml)</td>
<td>2.4 ± 1.4</td>
<td>4.6 ± 3.4</td>
<td>0.0001</td>
</tr>
<tr>
<td>TNF–alpha (pg/ml)</td>
<td>1.4 ± 0.9</td>
<td>1.3 ± 0.5</td>
<td>ns</td>
</tr>
<tr>
<td>CRP (ng/ml)</td>
<td>8074 ± 6467</td>
<td>12433 ± 7818</td>
<td>ns</td>
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</tbody>
</table>

Catalano, Diabetes Care, 2009

Early Pregnancy Concerns
- Spontaneous abortion
- Fetal anomalies, esp neural tube defects
- Difficult U/S

Antepartum Complications
- GDM and DM2
- Chronic hypertension
- Postterm pregnancy
- Failed ECV

Intrapartum Complications
- Prolonged labor
- Lower likelihood of VBAC success
- Preeclampsia
- Higher rates of cesarean delivery
- Anesthetic complications
- Macrosomia and shoulder dystocia
- Stillbirth
Postpartum Complications
- Longer hospital stays
- Infections
- Lower rates of breastfeeding

Long-term Risks to Offspring
- Obesity
- Cardiometabolic diseases (diabetes, hypertension, metabolic syndrome)
- Autism/neurodevelopmental disorders?

Fetal Programming
- Animal studies support the role of diet during pregnancy on body composition and metabolism after birth
- Improving diet during pregnancy may have long-term benefits for offspring

Infants Born to Obese Women are Fatter, PM Catalano, AJOG 109:419-33. 2007

<table>
<thead>
<tr>
<th></th>
<th>Pregravid BMI &lt; 25 (n=144)</th>
<th>≥ 25 (n=76)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>GWG, lb</td>
<td>15.2</td>
<td>13.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>B Wt, g</td>
<td>3284</td>
<td>3436</td>
<td>0.051</td>
</tr>
<tr>
<td>LBM, g</td>
<td>2951</td>
<td>3023</td>
<td>NS</td>
</tr>
<tr>
<td>Fat Mass, g</td>
<td>331</td>
<td>406</td>
<td>0.008</td>
</tr>
<tr>
<td>Body Fat, %</td>
<td>9.6</td>
<td>11</td>
<td>0.006</td>
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</table>
Antepartum Management

At first prenatal visit
- Screen for DM2 (repeat at 24 wks if neg)
- Measure and record BMI in chart
- Review weight gain goals and strategies with patient
- Discuss risks especially re: weight gain
- If concern for CHTN, baseline Cr, 24hour urine, LFTs

Fetal growth
- Obese women at increased risk for both SGA and LGA
- If fundus easily palpated, can follow fundal height
- If fundus not easily palpated, consider serial ultrasound for fetal growth

Intrapartum Management
On admission to L&D

- Consult anesthesia on admission
- Place internal monitors if needed
- Assess IV access
- Prepare for shoulder dystocia, especially if GDM/DM2 or suspected macrosomia
- Staffing considerations

If cesarean is needed

- No randomized trial of incision type; no evidence that vertical skin is preferable
- When pannus is massive, a supra-umbilical incision may be considered
- Pre-op antibiotics
- Subcutaneous sutures decrease risk of seroma
- Drains not shown to provide benefit
- Mechanical thromboprophylaxis (pneumatic compression)

Emergency Cesarean BMI ≥ 40

Need to plan for extra time to
- move patient to OR table
- induce anesthesia, and
- do the surgery
All will take longer, so have to move earlier to C/S especially for fetal indications

Length of labor

- First stage of labor *takes longer* among obese women
- As long as *maternal and fetal status reassuring*, may tolerate a slower labor curve in obese patient
- Second stage length NOT associated with BMI (nullips)
Previous C-section: Balancing Risks

Consider patient preferences and values

Advantages of vaginal birth VS.
Risks of unplanned c-section

Case – Do you offer TOL?

- 25 y.o. G3P2 at 37 weeks, pre-pregnancy BMI=40, desires TOL
- Gained 30 lbs this pregnancy
- 1st pregnancy NSVD
- 2nd pregnancy primary LTCS for breech
- She wants at least 4 children

Weight Gain During Pregnancy for Obese Women

The NEW IOM Report and Guidelines

IOM Recommendations for Weight Gain in Pregnancy 2009

<table>
<thead>
<tr>
<th>Pre-pregnancy BMI (kg/m²)</th>
<th>IOM Recommended Gestational Weight Gain (kg / lbs)</th>
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</thead>
<tbody>
<tr>
<td>&lt;18.5 (Underweight)</td>
<td>12.5-18 / 28-40</td>
</tr>
<tr>
<td>18.5 – 24.9 (Normal)</td>
<td>11.5-16 / 25-35</td>
</tr>
<tr>
<td>25.0 - 29.9 (Overweight)</td>
<td>7-11.5 / 15-25</td>
</tr>
<tr>
<td>≥30.0 (Obese)</td>
<td>5-9 / 11-20</td>
</tr>
</tbody>
</table>
Combined effects of obesity & excessive weight gain

- Preeclampsia, macrosomia, and cesarean birth increased among obese women gaining > 25 lbs during pregnancy (compared to obese women gaining less)

Comparison of weight gain by BMI category between PRAMS 2002-2003, and new IOM guidelines

Does Prenatal Advice on Weight Gain Matter?

- Receiving correct advice about weight gain was associated with actual weight gain within guidelines;
- Receiving no advice about weight gain was associated with gain outside guidelines;
- About a third of women report receiving no advice about how much weight to gain.

Barriers to weight gain counseling

- Insufficient nutrition training
- Belief that counseling is ineffective
- Concern about sensitivity of topic

Interventions to Restrict Weight Gain in Obese Women
Claesson/Sweden 2007
- 160 obese pregnant women received weekly private counseling sessions & aqua aerobics class
- 208 controls (non-randomized) had usual care
- Intervention group gained 2.6 kg less during pregnancy (8.7 vs. 11.3 kg, p<0.001)

Interventions to Restrict Weight Gain in Obese Women
Artal 2007 – study of weight-restriction regimen +/- exercise in obese with GDM
- 39 women in ED group
- ED group exercised 153 min/wk (mean)
- 57 in D group (self-selected/non-randomized)
- ED group had lower weight gain/week than D group, 0.1 vs 0.3 kg, P < 0.05

Restricting Weight Gain in Obese Women
Wolff/Denmark 2008 – RCT, ten 1-h dietary consultations, GWG restriction to 6-7 kg
- 50 women randomized (23 in intervention, 27 in control)
- Women in intervention group had ↓ energy intake, gained 6.6 kg vs. 13.3 kg in controls (P=0.002)
- Intervention group had improved glucose metabolism

Summary - Weight Gain Intervention Studies
- Small sample sizes – unknown if impact on outcomes other than weight (GDM, c-section, macrosomia)
- Not powered to exclude possibility of harm from weight restriction
- Diet and exercise can reduce weight gain among obese women
Aggressive weight control for obese women during pregnancy: Is it safe?
M.O.M.S.  
“Mindfulness, Obesity, Metabolism and Stress Management”

• Meditation  
• Stress Reduction  
• Prevent overeating  
  • Hunger and fullness awareness  
  • Emotional triggers  
  • Self-acceptance  
• Nutrition and activity

Obesity and Stress

• Stress-induced cortisol secretion drives excessive fat and sugar intake, “non-homeostatic eating”  
• Promotes toxic belly fat and insulin resistance

Bariatric Surgery & Pregnancy

• 220,000 procedures in 2008, ½ in reproductive-age women  
• Fewer obesity-related pregnancy complications post-surgery  
• Risks of vitamin deficiencies: iron, vitamin B12, calcium, folic acid, vitamin D

Concerns Following Bariatric Surgery

• Contraception needed for 12-18 months postop  
• Use small prenatal vitamins or liquid vitamin formula  
• Use glucola with caution – dumping syndrome  
• Close follow-up of weight gain and GI complaints  
• Some studies suggest increase risk of SGA compared to obese controls
Healthy Diet for Pregnancy: Enhance Complex Carbohydrates
Increase fruits and vegetables
Increase whole grains/fiber

Whole Grains
Steel cut Oats
Legumes
Vegetables, especially dark green
Fruits

Dietary Advice
- Whole-foods diet, high in fiber and nutrients
- Reduce or cut out high-calorie, highly-processed, nutrient-poor foods
- Cut out high-calorie beverages including juice
- Replace refined grains with whole grains
- Replace saturated fat/trans fat with plant-based and fish-based fats (nuts, avocados, olive oil, salmon)
- Legumes – beans, lentils
- Supplements: Folic acid, Vitamin D – obese women are especially deficient in these

Exercise/physical activity
- At least 30 min/day 5 days a week
- Base it on prior level of activity
- Walking
- Group activities

Summary
- Most obese women are gaining above the current (new) guidelines
- More research needed to establish safety of minimal weight gain / weight loss during pregnancy
- Excessive weight gain compounds risks of obesity
- On L&D, be patient but be prepared!
- We can improve outcomes among obese pregnant women w/ lifestyle interventions (counseling, diet, stress reduction, exercise)
“You can leave pregnancy healthier than you started”

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