Gestational Weight Gain by Obese Women and Maternal/Newborn Outcomes: A Systematic Review

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Search

- **Keywords**: obesity/obesity severity and gestational weight gain (GWG) and outcomes of pregnancy
- **Databases**: CINAHL, PubMed (Medline)
- English language: 2009-March 2012
- 66 articles retrieved: 12 retained
- All level II cohort studies
Literature Review

- **Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement**
- Covariates: maternal age, smoking, parity included in all study analyses except one
- WHO BMI classification
- 4 studies stratified results by obesity severity
  (Hinkle; Park; Blomberg; Bodnar)
Outcomes Assessed

(Aggregate data for all obese women and by severity of obesity)

- GWG in obese women: Range and pooled results
- SGA^{10th} and SGA^{2SD}
- LGA
- Cesarean birth (CS)
- Postpartum weight retention (PPWR)
Results: What is the range of GWG in obese women and does it vary with severity of obesity?

- 15-27% gain within guideline
  - (IOM 2009; 5-9kg)
- 48-72% gain in excess of guideline
- Mean GWG (11.36 kg ± 7.71)
- GWG decreased as obesity severity increased
- Weight loss more common in obese women and with obesity severity
- Obese parous women gain less than nulliparous
Results: *What is the risk for SGA and LGA in obese women and does it vary by severity of obesity or GWG*

- Prevalence of SGA$^{10th}$: 4.3-9.6%
- SGA$^{10th}$:
  - 10% in primigravid women (Nohr; Beyerlein)
  - 14.3% in obese adolescents (Harper)
- SGA$^{2SD}$: ≤ 2% in 2 studies (Hinkle, Bloomberg)
Results: What is the risk for SGA and LGA in obese women and does it vary by severity of obesity or GWG

- Prevalence of LGA^{10th}: 13.1 to 21%
  - 6.5% in obese adolescents (Harper)
- Severity of obesity significantly influenced the impact of GWG on risk for SGA and LGA
  - Risk for SGA decreased as obesity severity increased and inverse for LGA
  - Linear relationship was muted
Results: *SGA Risk and GWG*

- Obesity as one class (Blomberg; Harper; Vesco; Zilko)
  - Risk of SGA ≤10% with ≤ 5-9kg
  - Obese women not at risk even with weight loss (Beyerlein) in both nulliparous and multiparous women (Nohr)
Results: *SGA Risk and GWG*

- By obesity class with <5kg GWG (Hinkle, Bodnar, Blomberg, Park)
  - **Class I:**
    - $\text{SGA}^{10\text{th}} > 10\%$
    - $\text{SGA}^{2\text{SD}}$: risk increased but prevalence <5%
  - **Class II: Mixed results**
    - No risk of $\text{SGA}^{10\text{th}}$ (Park); risk increased with 3.2kg (Bodnar) at 10% (Hinkle)
    - No increase risk $\text{SGA}^{2\text{SD}}$ (Hinkle); increased but prevalence <5% (Blomberg)
Results: *SGA Risk and GWG*

- **Class III:**
  - No risk for SGA with <5kg
  - Weight loss increased odds of SGA but prevalence <5%
Results: *LGA Risk and GWG*

- LGA risk >10% with GWG 5-9 kg (Beyerlein; Bodnar; Ferraro; Hinkle; Vesco; Zilko)
- LGA >10% with no GWG (Zilko) or low GWG (Nohr)
- LGA <10% in class I women with < 5kg and 5-9kg GWG
- LGA risk lowered by 23% (class I, II) and 27% with GWG <5kg (class III)
- Weight loss and LGA <10% in class III (Blomberg; Park)
Results: What are the risks for cesarean delivery and do these risks vary with obesity and GWG?

- 4 studies
- Association b/t GWG and CS modest
- Highest increased risk when GWG >9kg
- Regardless of parity, GWG <5kg favors decreased risk
- Obesity severity affects risk with increases across all classes independent of GWG (Blomberg)
- Risk with GWG may be greatest in class I women
Results: What are the risks for PPWR do these risks vary with obesity and GWG?

- 4 studies
- Evaluations from 6-24 months PP
- Linear
- GWG <5kg: 70-80% reduction in PPWR (Nohr et al., 2009)
- Overall: 44.7% of obese women had a PPWR ≥2.5kg at 12-24 months
Conclusions

• Pre-pregnant weight and GWG influence outcomes
• Risks increase with GWG > 5-9kg
• GWG Recommendations based on risk assessment for all outcomes
  - Class I: 5-9kg
  - Class II: < 5kg but not weight loss
  - Class III: < 5 kg and gestational weight loss needs further evaluation
References


References


• Nohr EA, Vaeth M, Baker JL, Sorensen TA, Olsen J Rasmussen KM. Pregnancy outcomes related to gestational weight gain in women defined by their body mass index, parity, height, and smoking status. Am J Clin Nutr 2009;90:1288-94.


• Rode L, Kjaergaard H, Ottesen B, Damm P, Hegaard HK. Association between gestational weight gain according to body mass index and postpartum weight in a large cohort of Danish women. Matern Child Healt J 2012;16:406-413.

Thank you