Clinical aspects of obesity in Alaskan women and children

Neil Murphy MD
Southcentral Foundation
Alaska Native Medical Center
Objectives

• Describe impact of obesity before pregnancy
• Describe impact of obesity during pregnancy
• Describe impact of obesity after pregnancy
Let’s start with a win / win

• Weight gain that will be lost at delivery:
  – the fetus
  – amniotic fluid
  – Blood

• See how simple it can be?
Win / Win

- Fetus: 7 to 8 pounds (3.2 to 3.6 kg)
- Fat stores: 6 to 8 pounds (2.7 to 3.6 kg)
- Blood volume: 3 to 4 pounds (1.3 to 1.8 kg)
- Fluid volume: 2 to 3 pounds (0.9 to 1.3 kg)
- Amniotic fluid: 2 pounds (0.9 kg)
- Breasts: 1 to 3 pounds (0.9 to 1.3 kg)
- Uterine hypertrophy: 2 pounds (0.9 kg)
- Placenta: 1.5 pounds (0.7 kg)
Historical perspective

- Prior to 1970s severe dietary restriction
  - preeclampsia, etc...

- 1930s, all pregnant women advised to gain 15 pounds (6.8 kg)

- 1970s dietary restriction was associated
  - Low birth weight and neurologic impairment

- Late 1970s, dietary restriction replaced by gain 20 to 25 pounds (9 to 11 kg)
FERTILITY AND EARLY PREGNANCY ISSUES

• Subfertility
• Spontaneous abortion
ANTEPARTUM ISSUES

- Gestational and pregestational diabetes
- Pregnancy associated hypertension
- Preterm birth
- Postterm pregnancy
- Multifetal pregnancy
- Urinary tract infection
- Obstructive sleep apnea
- Placental abnormalities
• Underweight BMI <18.5
  – 28 to 40 lbs (12.5 to 18.0 kg)
• Normal BMI 18.5 to 24.9
  – 25 to 35 lbs (11.5 to 16.0 kg)
• Overweight BMI 25.0 to 29.9
  – 15 to 25 lbs (7.0 to 11.5 kg)
• Obese BMI ≥30.0
  – 11 to 20 lbs (5 to 9.0 kg)
INTRAPARTUM ISSUES

- Labor
- Induction
- Vaginal birth after cesarean delivery
- Cesarean delivery
- Anesthetic management
- Shoulder dystocia and other complications
POSTPARTUM ISSUES

- Infection
- Postpartum hemorrhage
- Breastfeeding
PERINATAL OUTCOME

- Congenital anomalies
- Perinatal mortality
- Macrosomia and subsequent weight
In the absence of pathological edema – preeclampsia…..

- Excessive weight gain is primarily due to an excessive increase in fat stores

- Biologic, genetic, and behavioral factors affect fat metabolism both during and after pregnancy
Is it all just hormonal?

• Leptin levels correlate positively with body fat content and BMI, increase during pregnancy, and appear to play a direct role in pregnancy-related weight gain and postpartum weight retention

• Progesterone levels during pregnancy are responsible for fat accumulation during the first and second trimesters, but for fat mobilization during the third trimester
Weight retained after pregnancy

- Mean 0.5 to 3 kg, but.....
- 14 - 25 % ≥4.5 kg
- IOM six months postpartum or later
  - Mean 5.4 kg (11.8 pounds)
  - 50% more than 4.5 kg (10 pounds)
  - 25% more than 9.1 (20 pounds)
- Exceeds comparable nulliparous women
Postpartum weight loss

• Intensity of lactation
• Duration of breastfeeding
  – greater than two months
Social variables

- Return to work
- Physical activity
- Smoking cessation
- Adolescents
- Parity
- Ethnicity
- Marital status
- Pregnancy interval
Social variables

- Whole life has changed
- Mental outlook has changed
Retention of weight postpartum

- 50% of weight gain is lost in first 6 weeks
- …then a lower rate of loss through the rest of the first six months
- If gain more than the IOM guideline
  - 2x likely to retain ≥9 kgs
- Black race
  - retain more weight than white women
How to predict long term gain?

- Women who attained their prepregnancy weight by 6 mo pp had less increase in long-term weight gain (2.4 versus 8.3 kg)

- Women who had large weight gains during the first pregnancy and/or retained weight after delivery were at higher risk of doing so in subsequent pregnancies
  - increased their long-term risk for obesity with each pregnancy
The best strategy....

- .....has not been determined, but....
- Suggested interval of six months to one year, or 0.5 kg/week

- Breastfeeding
  - RCT data suggests the safety and efficacy of this approach for both mother and infant
ENDOCRINE

- Impaired glucose tolerance
- Diabetes mellitus
- Metabolic syndrome
- Hyperandrogenism
- Growth and puberty
CARDIOVASCULAR

- Hypertension
- Dyslipidemia
- Other CV risks
- Adult coronary heart disease
GASTROINTESTINAL

- Nonalcoholic fatty liver disease
- Diagnosis
- Treatment
- Cholelithiasis
PULMONARY

- Obstructive sleep apnea
- Obesity hypoventilation syndrome
ORTHOPEDIC

- Slipped capital femoral epiphysis (SCFE)
- Tibia vara (Blount disease)
NEUROLOGIC

- Idiopathic intracranial hypertension
Co-morbidities in children

• DERMATOLOGIC

• PSYCHOSOCIAL