“All women with a BMI of greater than 50 should be delivered by planned Caesarean section”

Pat O’Brien
Institute for Women’s Health
University College London Hospitals
### Classification

#### WHO

<table>
<thead>
<tr>
<th>BMI (kg/m²)</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>from 18.5</td>
<td>underweight</td>
</tr>
<tr>
<td>up to 25.0</td>
<td>normal weight</td>
</tr>
<tr>
<td>25.0</td>
<td>overweight</td>
</tr>
<tr>
<td>30.0</td>
<td>class I obesity</td>
</tr>
<tr>
<td>35.0</td>
<td>class II obesity</td>
</tr>
<tr>
<td>40.0</td>
<td>class III obesity</td>
</tr>
</tbody>
</table>

**‘Super-obesity’ ≥ 45 or 50 kg/m²**

#### NIH

Morbid obesity ≥ 40 kg/m²
Risks

• Maternal
  – Anaesthetic
  – Obstetric
• Fetal

Obesity in the UK
Anaesthetic Risks: GA

- Airway difficulty
  - Failed intubation
    - General population (gynae): 1 in 2-3,000
    - Pregnancy: 1 in 250
      - BMI < 30: 2.2%
      - BMI > 30: 15.5%
        - Juvin et al, 2009
      - BMI > 40: 33%
        - Hood & Dewan, 1993
  - ↑O₂ consumption
  - Difficulty in ventilation
  - Displacement of ET tube

CEMACH 2007
Anaesthetic Risks: Regional

• Insertion of epidural / spinal difficult
  – Morbidly obese
    • > 1 attempt: 75%
    • >3 attempts: 14%

  *Perlow & Morgan, 1994*

• ↑ failure of (correctly sited) epidural: 42%
  *Hood & Dewan, 1993*

• Epidural and spinal space volume ↓
  ⇒ more extensive block for a given dose of LA
Maternal risks

• Miscarriage
  • Early: OR 1.2 (1.01-1.46)
  • Recurrent: OR 3.5 (1.03-12.01) Lashen et al, 2004
  • Following ART: OR 1.33 (1.06-1.68) Maheshwari et al, 2007

• Hypertensive Disorders in Pregnancy
  • BMI ≥ 40: OR 3.2 FASTER Trial, 2004
    – Pre-eclampsia
      • BMI ≥ 35: OR 3.3 (2.4-4.4)

• Gestational Diabetes
  • BMI ≥ 40: OR 4.0 (3.1-5.2) FASTER Trial, 2004

• Thromboembolic Disease
  • BMI ≥ 30: OR 5.3 (2.1-13.5) Larsen et al, 2007
Fetal risks

**Congenital anomalies**
- NTD: OR 1.87 (1.62-2.15)
- Spina Bifida: OR 2.24 (1.86-2.69)
- Cardiovascular anomalies: OR 1.3 (1.12-1.51)
- Cleft lip & palate: OR 1.2 (1.03-1.4)
- Anorectal atresia: OR 1.48 (1.19-2.36)
- Limb reduction: OR 1.34 (1.03-1.73)

**Other**
- Macrosomia
  - BMI ≥ 30: OR 2.1 (1.9-2.4)  
    *Batten et al, 2001*
- IUFD: nulliparous
  - BMI ≥ 30: ↑ x 4
    *Cnattingus et al, 1998 Kristensen et al, 2006*
- Neonatal Death
  - BMI ≥ 30: OR 2.6 (1.2-5.8)
    *Kristensen et al, 2006*

*Stothard et al, 2009
Meta-analysis (39 studies)*
• 52% of all women who died (direct and indirect deaths) were overweight or obese
  • Direct: 55%
  • Indirect: 49%
• 1 in 6 were morbidly or super-morbidly obese
• Very few anaesthetic deaths

Most deaths in these women are not anaesthetic-related
RCT of women with a BMI of > 50:
Planned Caesarean section
vs
Planned vaginal birth
Caesarean Section

What are the chances?

Caesarean section (nulliparous)

- BMI 25-29.9: ↑ x 1.5
- BMI 30-34.9: ↑ x 2.25
- BMI ≥ 35: ↑ x 3.38
- BMI ≥ 50: ↑ x 4.5

Poobalan et al, 2009
Meta-analysis of 11 studies

- Both elective and emergency CS rate ↑ by approx the same factor

Chu et al, 2007

- So emergency CS rate in labour ~ 50%?? (4.5 x 12%)

Caesarean section

• BMI ≥ 40: 39% (small numbers)
  Total CS = 39% (21% elective + 18% emergency)
  21% had elective
  So 79% aimed for vaginal delivery.
  18/79 had emergency CS = 23% emergency CS rate

Baeten et al, 2001

So let’s agree the risk of emergency CS is ~ 40%
Risks of Caesarean Section in obese women

- ↑ intra-operative blood loss
- ↑ operative time
- ↑ risk of damage to bowel or bladder
- ↑ risk of wound infection & endometritis
- ↑ risk of wound breakdown
- ↑ risk of DVT & PE
- Longer hospital stay
- ↑ risk of UTI

- ↑ staff attrition rate

Kabiru et al, 2004
Myles et al, 2002
Perlow et al, 1994
CS vs Vaginal Birth

**Planned Elec CS**
- 100% CS
  - ↑ intra-operative blood loss
  - ↑ operative time
  - ↑ risk of damage to bowel or bladder
  - ↑ risk of wound infection & endometritis
  - ↑ risk of wound breakdown
  - ↑ risk of DVT & PE
  - Longer hospital stay
  - ↑ risk of UTI
  - ↑ risk of Neonatal RDS

**Planned Vag Birth**
- 40% CS
- 60% Vag Birth

OK! (perhaps)
Term Breech Trial

Articles

Planned caesarean section versus planned vaginal birth for breech presentation at term: a randomised multicentre trial

Mary E Hannah, Walter J Hannah, Sheila A Hewson, Ellen D Hodnett, Saral Saigal, Andrew R Willan, for the Term Breech Trial Collaborative Group*

Summary

Background For 3–4% of pregnancies, the fetus will be in the breech presentation at term. For most of these women, the approach to delivery is controversial. We did a

Introduction

About 3–4% of all pregnancies reach term with a fetus in the breech presentation. Data from previously published cohort studies have shown that, in general, planned caesarean section is better than planned

<table>
<thead>
<tr>
<th>Event</th>
<th>Planned caesarean section (n=1041)</th>
<th>Planned vaginal birth (n=1042)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation at delivery*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breech</td>
<td>1018 (97.7%)</td>
<td>994 (95.5%)</td>
<td>0.02</td>
</tr>
<tr>
<td>Cephalic†</td>
<td>19 (1.8%)</td>
<td>39 (3.7%)</td>
<td></td>
</tr>
<tr>
<td>Oblique/ transverse lie</td>
<td>4 (0.4%)</td>
<td>8 (0.8%)</td>
<td></td>
</tr>
<tr>
<td>Mode of delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caesarean section before labour</td>
<td>470 (45.2%)</td>
<td>75 (7.2%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Caesarean section after labour</td>
<td>471 (45.2%)</td>
<td>376 (36.1%)</td>
<td></td>
</tr>
<tr>
<td>Vaginal delivery</td>
<td>100 (9.6%)</td>
<td>591 (56.7%)</td>
<td></td>
</tr>
<tr>
<td>General anaesthesia</td>
<td>294 (28.2%)</td>
<td>132 (12.7%)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Labour before planned CS

Elective caesarean section at 38 weeks versus 39 weeks: neonatal and maternal outcomes in a randomised controlled trial*

J Glavind,^a SF Kindberg,^a N Uldbjerg,^a M Khalil,^b AM Møller,^c BB Mortensen,^d OB Rasmussen,^e JT Christensen,^f JS Jørgensen,^g TB Henriksen^h

^a Department of Obstetrics and Gynaecology, Aarhus University Hospital, Aarhus N, Denmark ^b Department of Obstetrics and Gynaecology,

Planned CS (38 weeks): 7.7% laboured before
Planned CS (39 weeks): 12.9% laboured before
“ALL women with a BMI of greater than 50 should be delivered by planned Caesarean section”
CS vs Vaginal Birth: previous vaginal birth

- Planned Elec CS
  - 100% CS (10% emergency)
    - ↑ intra-operative blood loss
    - ↑ operative time
    - ↑ risk of damage to bowel or bladder
    - ↑ risk of wound infection & endometritis
    - ↑ risk of wound breakdown
    - ↑ risk of DVT & PE
    - Longer hospital stay
    - ↑ risk of UTI

- Planned Vag Birth
  - 5% CS
  - 95% Vag Birth

Boyle et al, 2013

More emergency CS in ‘Planned CS’ group!
‘Planned’ vaginal birth

• Induce labour at 38 weeks (low risk of neonatal RDS after labour)
• Expect labour and delivery within 24 hours (likely less)
• Experienced anaesthetist on site
• Early epidural (even prior to IOL)

• Risk of CS ↓ by IOL (~ 3%)