Maternal Nutrition
- what does the future hold?

Dr Julie Abayomi
Current concerns

• Increasing prevalence of obesity
• Increasing severity of obesity
• High risk pregnancy
• Obesity masks under nutrition
  – Poor diet quality.
Obesity in Pregnancy

- Obesity in pregnancy is increasing in both prevalence and severity:
  - 1/1000 UK pregnancies have BMI ≥ 50 kg/m²
    - (NICE 2010)
- In Liverpool:
  - 27% BMI ≥ 25kg/m²
  - 17% BMI ≥ 30kg/m² (1,189 women per year)
  - 113 women BMI ≥ 40 kg/m²
    - (Abayomi et al 2009)
Health Risks

• Obesity and excessive weight gain in pregnancy are associated with:
  – gestational diabetes
  – macrosomia
  – pre-eclampsia
  – caesarean section
  – and post operative complications.
    • (Galtier-Dereure et al 2000)
Management of Obesity in Pregnancy

• NICE (2010) recommends:
  – Achieving a healthy weight before conception
  – Avoid dieting while pregnant

• CMACE/RCOG (2010)
  – Encourage weight loss before & after pregnancy
  – Encourage ‘healthy eating and appropriate exercise to prevent excessive weight gain during pregnancy’.
Safe weight gain?

• Currently there are no UK guidelines regarding safe weight gain during pregnancy.

• Institute of Medicine (IOM, USA) (2009) recommends limiting weight gain to 5-9 kg (when BMI $\geq 30$ kg/m$^2$).
Fit for Birth

• To explore patterns of gestational weight gain in obese pregnancies
  – in comparison to IOM recommendations*.
• Women with BMI $\geq 30$ kg/m$^2$ were recruited from antenatal booking-in appointments and weighed at each trimester of pregnancy.
• Weight change was calculated
• and then compared with categorised pregnancy weight gain
  – *(<0kg, 0-5kg, 5-9kg and $>9$kg).
Results

• Between June 2009 and June 2010,
• 824 women consented to participate
• and weight data were collected for 756 women.

• Drop out
  – Only 476 women had weight measured in the 3rd trimester
  – Often due to difficulties attending clinic appointments.
<table>
<thead>
<tr>
<th>Initial BMI (women with 1st &amp; 3rd weights)</th>
<th>Gestational weight gain (GWG)</th>
<th>N (% of BMI group)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-34.9 (226)</td>
<td>&gt;9 kg</td>
<td>102 (45.1)</td>
</tr>
<tr>
<td></td>
<td>5.1-9 kg</td>
<td>51 (22.5)</td>
</tr>
<tr>
<td></td>
<td>0-5 kg</td>
<td>62 (27.4)</td>
</tr>
<tr>
<td></td>
<td>Weight loss</td>
<td>11 (4.9)</td>
</tr>
<tr>
<td>35-39.9 (132)</td>
<td>&gt;9 kg</td>
<td>53 (40.1)</td>
</tr>
<tr>
<td></td>
<td>5.1-9 kg</td>
<td>33 (25.0)</td>
</tr>
<tr>
<td></td>
<td>0-5 kg</td>
<td>37 (28.0)</td>
</tr>
<tr>
<td></td>
<td>Weight loss</td>
<td>9 (6.8)</td>
</tr>
<tr>
<td>≥ 40 (69)</td>
<td>&gt;9 kg</td>
<td>18 (26.0)</td>
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<tr>
<td></td>
<td>5.1-9 kg</td>
<td>14 (20.3)</td>
</tr>
<tr>
<td></td>
<td>0-5 kg</td>
<td>21 (30.4)</td>
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<tr>
<td></td>
<td>Weight loss</td>
<td>16 (23.2)</td>
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<tr>
<td>All (427)</td>
<td>&gt;9 kg</td>
<td>173 (40.5)</td>
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<tr>
<td></td>
<td>5.1-9 kg</td>
<td>98 (22.9)</td>
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<tr>
<td></td>
<td>0-5 kg</td>
<td>120 (28.1)</td>
</tr>
<tr>
<td></td>
<td>Weight loss</td>
<td>36 (8.4)</td>
</tr>
</tbody>
</table>

Table 1: Gestational weight gain compared to IOM BMI categories
Weight change at 36 weeks

Individual participants weighed regularly (n=39)
Results

• Missing weight data made statistical analysis difficult but

• In a model to assess predictors of gestational weight gain (GWG)

• a higher booking BMI was negatively associated with GWG
  – ($\beta$ -0.25, 95% CI -0.32 to -0.19, $p<0.001$).

• Women with BMI 30-40 kg/m$^2$ are more likely to gain excessive weight > 9kg.
Pregnancy Outcome

• Weight data was compared to pregnancy outcome data (from medical records).
• Weight gain >9kg had the highest odds of adverse outcomes.
  – [OR 1.07, 95% CI 1.03 to 1.12, p=0.001]
• Weight loss also had greater odds of adverse outcomes, but
  – The number of women who lost wt was small (n=36)
  – We do not know how or why they lost wt.
Nutrition arm of the study

• Mean energy intakes at each trimester were similar to the estimated average requirement (EAR) of 1940-2140 kcal/d (COMA 1991)
  • 1849 kcal/d – Trimester 1
  • 1984 kcal/d - Trimester 2
  • 2066 kcal/d – Trimester 3
Quality versus quantity?

- Overall iron intakes were low with
  - 63.6% achieving <EAR
  - 22.5% achieving <LRNI
- Despite increased energy consumption as pregnancy progressed, iron intakes did not improve
  - 1.37mg/MJ
  - 1.27 mg/MJ
  - 1.34 mg/MJ
- Consumption of calcium & NSP also declined
- Consumption of total fat & SFA increased.
Conclusion

• Guidelines for managing obesity in pregnancy tend to focus on limiting weight gain, rather than overall quality of diet.

• The results suggest that despite a high BMI and an adequate energy intake, **quality** of diet may be lacking and may deteriorate in obese pregnant women.
Acknowledgements

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