Gestational Diabetes risk for South Asians

Preliminary descriptive data analysis for the Diabetes and Pregnancy clinic
* No disclosures

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* Acknowledge Denis Tsang (Dietetic Intern, MAN program, U of G) for statistical analysis of data
According to the 2006 census, Canada’s visible minority population is growing at a rate of 27%
* 1 in 3 Canadians will belong to a visible minority by 2031

* In 2006, South Asians surpassed Chinese to become Canada’s largest visible minority group

* South Asians have high rates of diabetes and one of the highest rates of premature cardiovascular disease (CVD) in the world

* India, together with China and the Middle East, are now considered the “hot spots” of diabetes, with a projected doubling in incidence of the disease over the next 20 years
Interrelationship between maternal age, BMI and racial origin

(Makgoba et al., 2011, BJOG)

* Retrospective Study
* 15 maternity units between 1988 and 2000
* Data compared to White European Women age 20-24
## Odds Ratios for development of GDM

<table>
<thead>
<tr>
<th></th>
<th>White European</th>
<th>Black African</th>
<th>Black Caribbean</th>
<th>South Asian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 25-29</td>
<td>1.16</td>
<td>3.40</td>
<td>3.25</td>
<td>3.85</td>
</tr>
<tr>
<td>Age 30-34</td>
<td>2.04</td>
<td>6.28</td>
<td>5.23</td>
<td>8.77</td>
</tr>
<tr>
<td>Age 35-39</td>
<td>2.97</td>
<td>13.67</td>
<td>1.96</td>
<td>14.05</td>
</tr>
<tr>
<td>Age&gt; 40</td>
<td>4.08</td>
<td>59.2</td>
<td>6.87</td>
<td>27.43</td>
</tr>
<tr>
<td>BMI 18.5-24.9</td>
<td>1.00</td>
<td>2.62</td>
<td>1.21</td>
<td>3.00</td>
</tr>
<tr>
<td>BMI 25.0-29.9</td>
<td>1.77</td>
<td>3.48</td>
<td>3.35</td>
<td>7.70</td>
</tr>
<tr>
<td>BMI &gt; 30</td>
<td>4.70</td>
<td>12.83</td>
<td>5.85</td>
<td>17.39</td>
</tr>
</tbody>
</table>
Age

* Higher risk for developing GDM in:
  * White European women age > 30
  * Black Africans or Black Carribeans age > 25
  * South Asians age > 20
  * Rate of GDM rose more rapidly with age
BMI

* White Europeans and Caribbean groups
  * Significantly higher risk in overweight (BMI > 25) and obese (BMI > 30)

* Black Africans and South Asians
  * Significantly higher risk in all BMI groups
*South Asians develop abnormal glucose, lipids and blood pressure at significantly lower BMIs (21) compared to caucasians (30)*

*Increased tendency to develop visceral abdominal fat and fatty infiltration of the liver*

*Reasons for increased metabolic sensitivity to weight gain is unknown*
*South Asia

India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan, Maldives
Low birth weight
  * Thin-fat phenotype
  * South Asian babies may be smaller but have similar subscapular skin-fold thickness

Under nutrition
  * Intrauterine under nutrition and increased risk of metabolic syndrome
Intrauterine Undernutrition

Adaptation of fetal physiology to increase survival

Continues use of energy saving mechanism in a post-natal environment rich in energy

Increase adiposity and metabolic abnormalities
Micronutrients

- Higher adipose tissue and insulin resistance in children born to South Asian mothers with low B12 and high Folate concentrations

- Large proportion of South Asian women are vegetarians (low B12 intake)
  - B12 deficiency further masked by folic acid supplementation in pregnancy
Low adiponectin levels

- Made by adipose tissue (and placenta in pregnancy)
- Regulates glucose and fat oxidation
- Association with diabetes and metabolic syndrome
Maternal glycemic status

* Prenatal exposure to maternal diabetes associated with higher risk for overweight and obesity

* Increased exposure to glucose, free fatty acids and amino acids results in fetal hyperinsulinemia and larger fat mass
Next steps?

* START South Asian Birth Cohort Study
  * Find early life determinants of adiposity

* Consider early screening and intervention for high risk ethnic groups

* Interventions should also focus on long-term diabetes risk not just in pregnancy
Diabetes and Pregnancy Clinic

(Partnership between Dr. Liutkus and Diabetes Education Program at Cambridge Memorial Hospital)

*N = 83

*Data collected Sep 2012 to Aug 2013
Average age = 31.8
Pre-pregnancy BMI

Postnatal BMI
% 

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caucasian</td>
<td>67%</td>
</tr>
<tr>
<td>South Asian</td>
<td>15%</td>
</tr>
<tr>
<td>Asian</td>
<td>6%</td>
</tr>
<tr>
<td>Other</td>
<td>4%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>4%</td>
</tr>
<tr>
<td>African</td>
<td>4%</td>
</tr>
<tr>
<td>Arab</td>
<td>1%</td>
</tr>
</tbody>
</table>
*Weeks gestation at 1st visit*
Insulin Required

- Yes: 53%
- No: 47%

Number of Insulin Injections

- OD: 48%
- BID: 25%
- TID: 7%
- QID: 21%

Insulin requirement
Total Weight Gain in Pregnancy

- 0-5 kg: 14%
- 6-10 kg: 32%
- 11-15 kg: 29%
- 16-20 kg: 10%
- 21-25 kg: 14%
- >25 kg: 1%
Average weeks = 38.4

Weeks Gestation at Delivery

- 35 weeks: 4%
- 36 weeks: 1%
- 37 weeks: 10%
- 38 weeks: 45%
- 39 weeks: 24%
- 40 weeks: 10%
- 41 weeks: 7%
Induction

- Thrombocytopenia
- Previous Stillbirth
- Twin Gestation
- Poly/oligohydraminos
- Decreasing Insulin... (partial term)
- Over Term
- Gestational Diabetes (GDM)
- Bleeding
- PROM

None stated: 48%
PIH: 14%
Over Term: 8%
Poly/oligohydraminos: 8%
Decreasing Insulin: 4%
GDM: 4%
Bleeding: 4%
PROM: 4%
Twin Gestation: 2%
Previous Stillbirth: 2%
Thrombocytopenia: 2%

Yes: 40%
No: 60%
Delivery Type

- 46% Vaginal
- 54% Cesarian

Reason for C-section

- Planned repeat: 55%
- Failure to progress: 34%
- Other: 11%

Delivery
Neonatal data

Hypoglycemia

- Yes: 13%
- No: 87%

Weight (kg)

- 2.0-2.5: 6%
- 2.6-2.9: 17%
- 3.0-3.5: 43%
- 3.6-3.9: 23%
- >4.0: 11%
Breastfeeding at 3 months postpartum

- 68% Yes
- 32% No
*Diabetes and Pregnancy Clinic Outcome Analysis

Postpartum Glucose Tolerance Screening
* 50% return for postpartum glucose tolerance testing

(CPG 2013, Schaefer 2009, Kwong 2009)

* Women who do not complete postpartum testing tend to:
  * Previous history of GDM
  * Have higher diagnostic glucose levels
  * Required insulin during pregnancy
  * Had more living children

(Hunt et al 2009, Ferrara et 2009, Kwong 2009)

* Barriers to completion of postpartum screening:
  * Discontinuity of care after delivery
  * Underestimating diabetes risk
  * Lack of child care
  * Stress of adapting to caring for a new baby

(Schaefer-Graf 2009, Kwong 2009)
Cohort 1
* Sep 2011 to Aug 2012
* N=78
* Given postpartum OGTT requisition at initial consult
* No postpartum follow-up

Cohort 2
* Sep 2012 to Aug 2013
* N=71
* Given postpartum OGTT requisition at initial consult
* Given 3 month postpartum follow-up visit

*Postpartum OGTT*
81% completion rate with implementation of a 3 month postpartum follow-up visit
*Postpartum Diagnosis*
Further data to be analyzed

Comparison of weight gain before and after intervention

Mean weight gain is 79% less after counselling compared to pre counselling.

Covariate analysis to determine any significant associations

No significant association between weight gain and need for insulin
Thank you


