Diabetes and breastfeeding

Eleanor Gates

MMid(Hons) RN RM IBCLC

Aims

- Whistle stop diabetes revision
- Obesity - it's relationship to diabetes
- NZ incidence (ethnicity related)
- The impact of having diabetes on pregnant women and their babies
- The impact breastfeeding can have on diabetes for babies and their mothers

Diabetes revision – T1DM

- Type 1 Diabetes Mellitus (T1DM), formerly known as 'IDDM' or 'Juvenile onset' - an autoimmune disorder attacking the pancreatic beta cells
- Onset can be from <1 yr to 30 years plus
- Associated with poorer breast tissue development in puberty

T1DM and Breastfeeding

- T1DM may delay Lactogenesis II (LGII) for up to 2 days
- Possible unstable Neonatal BG
- Breastfeeding tends to stabilise BG in T1DM mothers often resulting in decreased Insulin needs

T2DM

- Type 2 Diabetes Mellitus (T2DM), formerly known as 'NIDDM' or 'Adult onset' - a metabolic disorder caused by resistance to the action of insulin on body tissues and/or reduced insulin secretion due to beta cell depletion

- Decreasing insulin secretion capacity results in impaired glucose tolerance, which then leads to the development of T2DM

T2DM

- Blood glucose rises due to placenta hormones increasing insulin resistance
- Insulin requirements increase four-fold in pregnancy - some women cannot produce enough insulin to cope with the higher blood glucose levels

T2DM and Breastfeeding

- Possible unstable Neonatal BG
- Lactation is normally unaffected, but if ↑BMI, the obesity may delay/lower lactation a little

Gestational Diabetes Mellitus

- Gestational Diabetes Mellitus (GDM)
- GDM usually goes away after pregnancy, but women have a 33 – 66% risk of developing T2DM later in life
- NOTE - Some women with 'GDM' have undiagnosed T2DM or even occasionally undiagnosed T1DM…..GTT @ 6/52

Risks/Impact

- **Intrapartum** - Macrosomia increasing the risk of birth trauma (sh. dystocia, 3rd/4th degree tears), forceps or Caesarean delivery

- **Neonatal** – increased risk of: prem labour, hypoglycaemia, respiratory distress syndrome, jaundice and infection, increased admission to SCBU (↑ 4% NSH)

- Increased risk of developing diabetes later on for both mother and baby

Risks/Impact during BF

Increased risk of;

- Thrush

- Mastitis (especially if diabetes is poorly controlled)

- Response to Rx is slower

Revision over!
On to the nitty-gritty

How big is our issue?

"An epidemic of T2DM is occurring in New Zealand, as in other developed countries, driven mainly by demographic trends and the increasing prevalence of overweight and obesity." (MoH 2010)

Rates of GDM have been increasing….in particular over the last 2 years (University of Auckland, 2013)

How big is our issue?

- 62% of all New Zealand adults are obese or overweight
- 8 times higher incidence in Maori & PIs than Euro
- Increasing incidence in Indian & Chinese...with diabetes occurring at a lower BMI category (22 to 24.9kg/m2) (Hedderson, 2012)

How big is our issue?

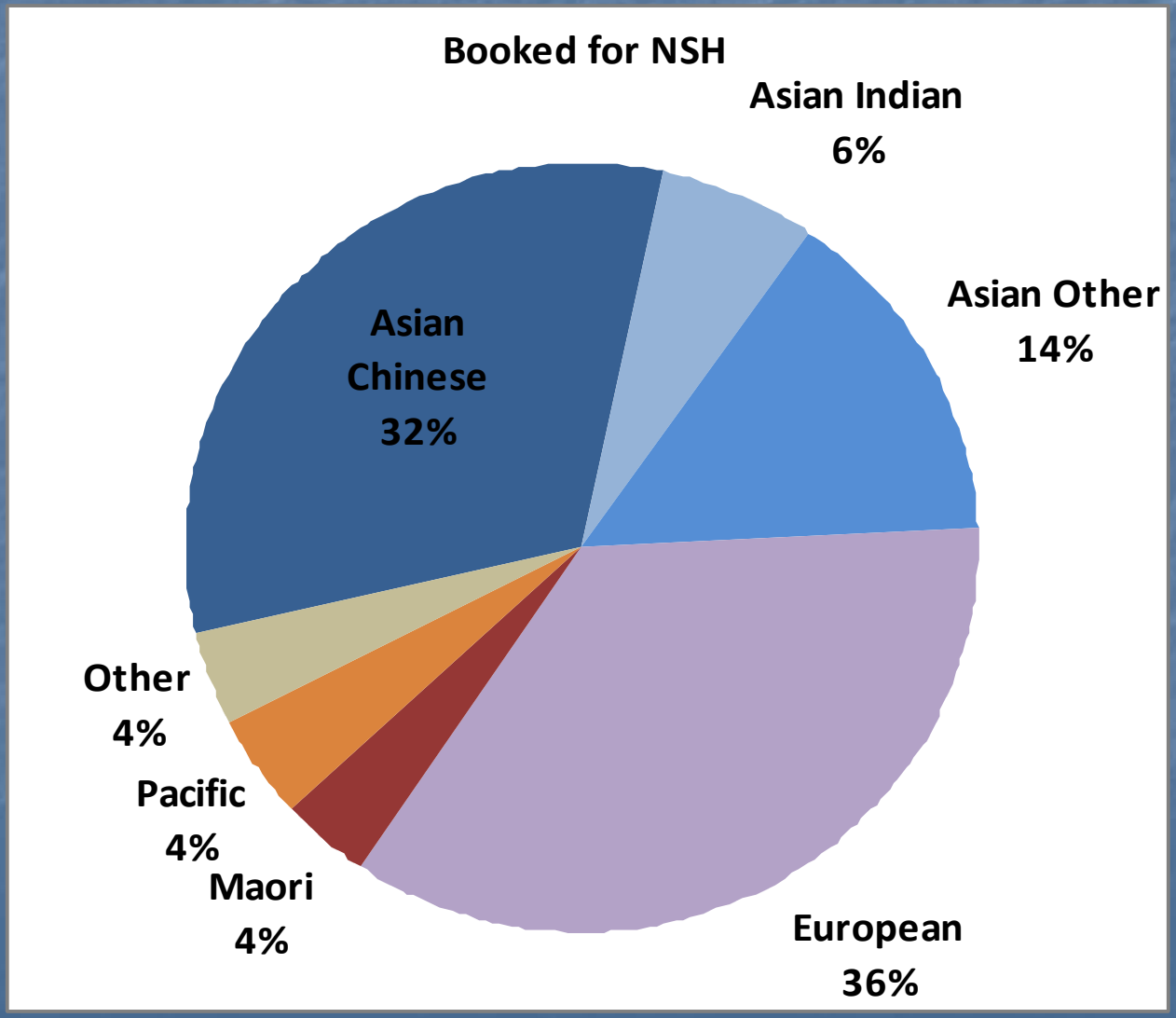
- There is an interaction between age and ethnicity suggesting an increased risk for South Asian women at a younger age when compared to white European women as a reference group (Makgoba, 2012).

- Several observational studies identified women from Asia and India as being at high risk of developing gestational diabetes (Teh 2011, Teede 2011, Savitz 2008, Nanda 2011, Makgoba 2012, Hedderson 2010, Ismail 2011).

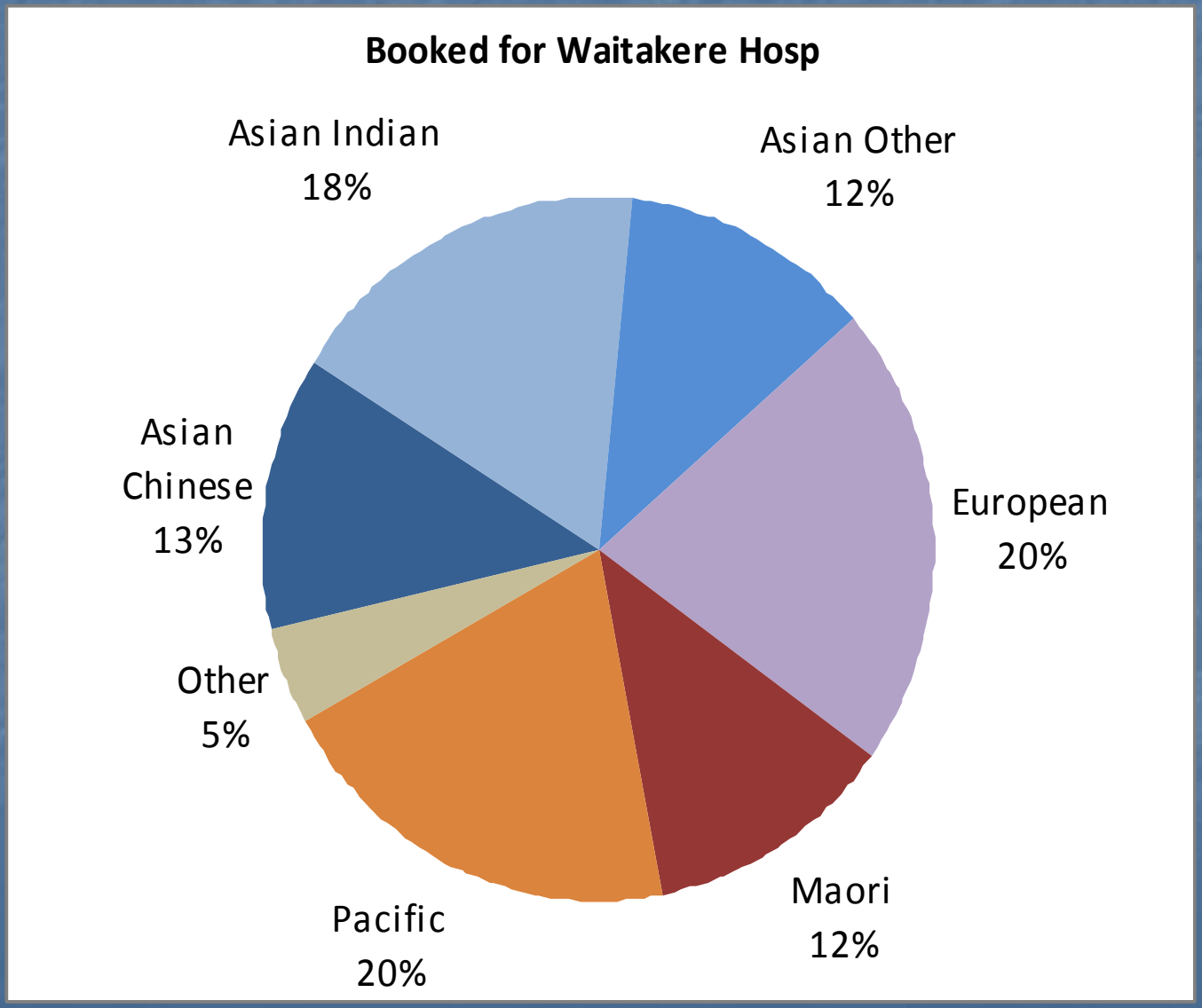
How big is our issue?

- Five studies identified Chinese women as being at high risk (Ismail 2011, Teh 2011,Teede 2011, Hedderson 2010, Yang 2009, Winnard 2013)
- Three studies found an overall increased risk associated with being a migrant compared with being a national (born in the country) (Schneider 2011, Hedderson 2010, Savitz 2008).

Ethnicities for first year of Maternity Diabetes Service NSH



Ethnicities for first year of Maternity Diabetes Service WTK



So….why is exclusive breastfeeding so much more important for these women?

An even choice?

How does formula compare to breastmilk?

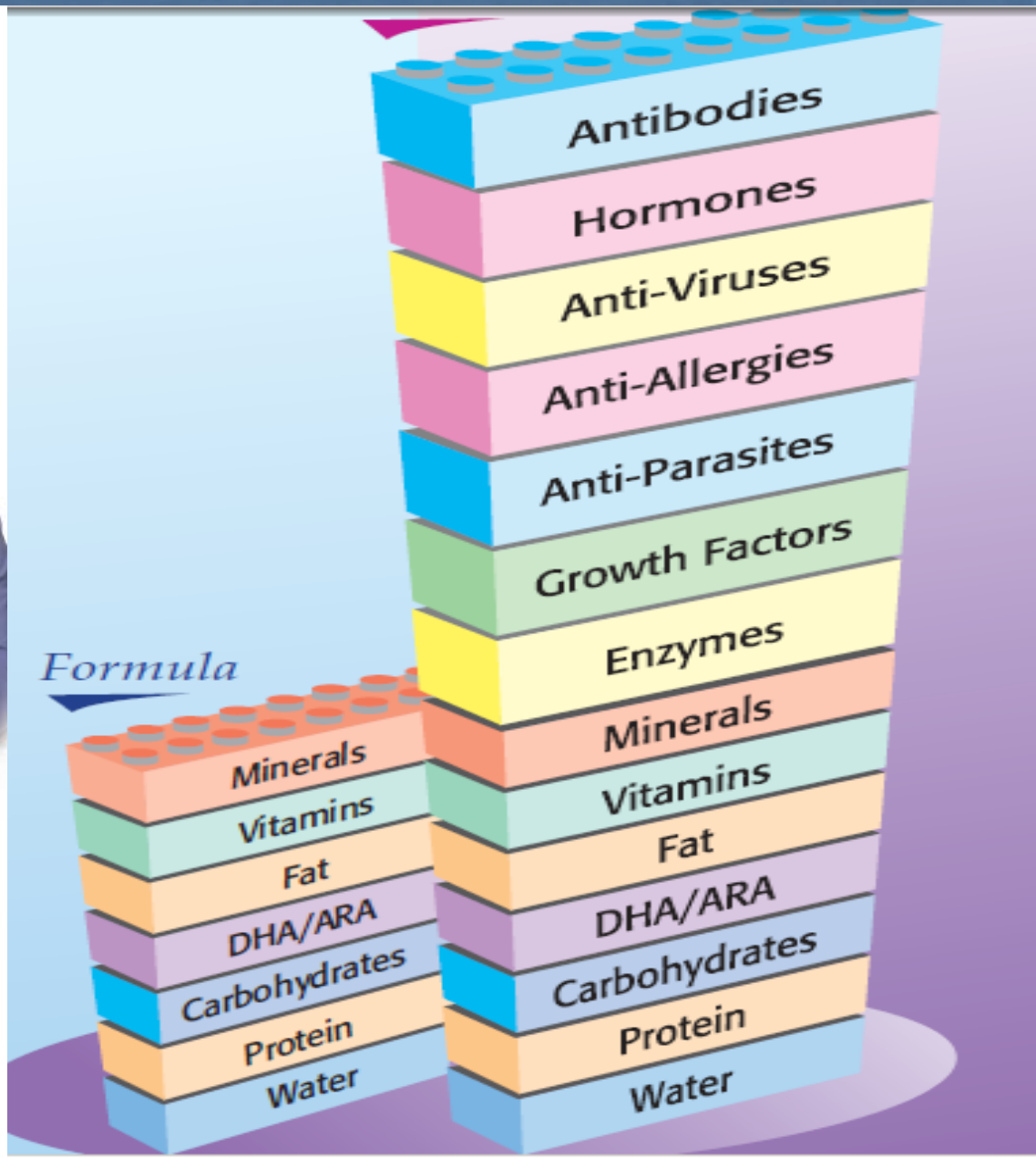
Compared to mother's breastmilk, formula is missing many things babies need to be strong, healthy and smart. Did you know…

Formula-fed babies have a greater risk of:

- Ear infections
- Diarrhea / constipation
- Pneumonia
- SIDS (Sudden Infant Death Syndrome)

Children who were formula-fed have a greater risk of:

- Obesity (becoming overweight)
- Diabetes
- Asthma and allergies
- Cancer



EXCLUSIVE breastfeeding?

- Exclusive means the baby receives nothing but breastmilk or expressed breastmilk;
- No water
- No tea
- No honey water or sugar water

No formula

No foods

How does obesity affect….?

- T2DM and GDM are very much associated with obesity…

……obesity affects <u>all</u> organs

- Breast tissue is insulin-sensitive tissue, it requires insulin to initiate milk production

How does obesity affect….?

- Diabetes is more common in artificially-fed children (Gerstein H 1994; Dewey K 1995)
- Babies receiving exclusive breastmilk for longer periods show the least amount of disease (Cunningham 1979)

This grows…..

into this….

How does breastfeeding affect….?

- Species specific substance
- Secretory Immunoglobulin A (SIgA)
- Colostrum contains carnitine, an enzyme for lipid mobilisation in brown fat

Why breastfeed?

- **RR of a ExBF baby developing T1DM by age 40 is half of that of a formula fed baby**
  (Pettitt et al 1997)

- **Babies breastfed for less than a week or mixed fed in the 1st week of life are twice as likely to develop diabetes as those who were exclusively breastfed for longer than a week** (Gimeno and de Souza 1997)

Why breastfeed?

- **ExBF for 2-3 months has significant protective effects for the child against T1DM** (Kimpimaki et al 2001)

- **Hypothesis: ExBF babies have increased protection due to progressive beta-cell autoimmunity** (Karjalainen et al 1992) **and later exposure to cows milk peptides (> 6/12)** (Dosch et al 1999)

The Public Health message is…

…**Breastfeed!**

The Public Health message…

- **2-20% of T1DM can be attributable to little or no breastfeeding and can be reduced by exBF to 3/12** (Perez-Bravo 1996)

- **Breastfeeding is a cost effective intervention that reduces or delays the onset of T2DM in women who have had GDM** (Kjos et al 1993)

The Public Health message…

- **Breastfeeding reduces the incidence of T2DM in the non-diabetic mother**

  (Struebe et al 2005)

- **Women with T2DM and GDM who do not lactate following pregnancy are more likely to develop T1DM** (Riordan J 2005)

Breastfeeding has been adopted by every major health organization in the world as a public health issue because the consequences of a population NOT breastfeeding have had devastating effects on even the richest countries in the world.

Sub-optimal feeding of humans, especially infants, has negative consequences in the short and or long term health for the general population.

What does research show?

- **Women with T2DM and GDM may have delayed LGII for up to 1–2 days (PN 4-5), but usually by Day 7 normal milk supply is achieved** (Walker M 2002)

- **Pre-pregnant overweight and obesity diminish the prolactin response to suckling in the first week postpartum** (Rasmussen KM; Kjolhede CL. 2004)

What does research show?

- **T1DM may be associated with delayed lactation (48-96hrs) and possibly lower lactation** (Murtaugh et al 1998)

- **With antenatal colostrum expression, and good breastfeeding initiation management, most T1s should be able to breastfeed successfully**

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