



Inside This Issue:

Headline

Clinical practice guidelines on diabetes and pregnancy (P.1)

Monthly Health Focus

Cow's milk, proteins and allergy (P.1)

Featured News

Paving the way for better cognition — Hints from new science (P.2)

Latest Science

Latest discoveries on human milk oligosaccharides (HMOs) (P.2)

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WYE-PM-020-JAN-19

IMPORTANT NOTICE: The World Health Organization (WHO**) has recommended that pregnant women and new mothers be informed on the benefits and superiority of breast-feeding – in particular the fact that it provides the best nutrition and protection from illness for babies. Mothers should be given guidance on the preparation for, and maintenance of, lactation, with special emphasis on the importance of a well-balanced diet both during pregnancy and after delivery. Unnecessary introduction of partial formula feeding or other foods and drinks should be discouraged since it will have a negative effect on breast-feeding. Similarly, mothers should be warned of the difficulty of reversing a decision not to breast-feed. Before advising a mother to use an infant formula, she should be advised of the social and financial implications of her decision: for example, if a baby is exclusively formula-fed, more than 400g per week will be needed, so the family circumstances and costs should be kept in mind. Mothers should be reminded that breast-milk is not only the best, but also the most economical food for babies. If a decision to use an infant formula is taken, it is important to give instructions on correct preparation methods, emphasizing that unboiled water, unsterilized bottles or incorrect dilution can all lead to illness. **See: *International Code of Marketing of Breast Milk Substitutes*, adopted by the World Health Assembly in Resolution WHA 34.22, May 1981.

Headline

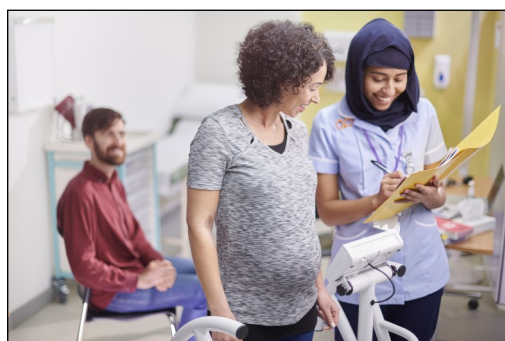
Clinical practice guidelines on diabetes and pregnancy

Emily Tai, PhD, Mphil, MSc, BSc (Hons)

The **Diabetes Canada Clinical Guidelines Expert Committee** has published a new set of guidelines covering pregnancy in pre-existing diabetes, overt diabetes diagnosed early in pregnancy and gestational diabetes (GDM). Here is a summary of some key recommendations.

Prevention of GDM

For women at high risk of GDM based on pre-existing risk factors, **nutritional counseling on health eating and prevention of excessive weight gain in early gestation should be provided**, ideally prior to 15 weeks' gestation, to lower the risk of GDM development.



Reference: 1. Feig DS et al. *Can J Diabetes*. 2018; 42: S255-S282.

Monthly Health Focus

Cow's milk, proteins and allergy

Danica Yau, Accredited Practising Dietitian (DAA), MSc, BSc (Hons)

There are speculations that food allergies such as cow's milk allergy (CMA) which may result in inflammation of the gut mucosa can be part of the pathogenesis of various functional gastrointestinal disorders in infants and children¹. There have been continuous effects to **reduce the allergenicity of cow's milk by processing methods such as hydrolysis**, which can destroy or inactivate epitopes by breaking down protein molecules into smaller peptides with less allergenicity². **β-lactoglobulin protein, a major allergenic component of cow's milk³, is an example where protein allergenicity can be reduced through hydrolysis²**. These protein hydrolysis processes often involve the use of **enzymes like trypsin²**, which is one of the enzymes taking part in digestion in the infant's gastrointestinal tract⁴, and also found to actively partake in digestion of human milk proteins within the mammary gland

Management of GDM

- Healthcare professionals should discuss proper weight gain and lifestyle intervention strategies regularly during pregnancy;
- Nutritional counselling by a Registered Dietitian should be offered to support achieving nutrition, weight and blood glucose targets;
- Pharmacologic treatment is needed if women with GDM do not reach glycemic targets within 1 to 2 weeks via nutritional therapy and physical activities;
- Glyburide may be prescribed if women with GDM decline insulin therapy and cannot tolerate or are inadequately controlled on metformin;
- Women with GDM should perform self-monitoring of blood glucose and strive for the following target values:

Fasting & pre-prandial	< 5.3 mmol/L
1-hour post-prandial	< 7.8 mmol/L
2-hour post-prandial	< 6.7 mmol/L
On insulin therapy	> 3.7 mmol/L

Scan to view recommendations:



References: 1. Pensabene L et al. *Nutrients*. 2018;10:1716. 2. Salvatore S et al. *Nestle Nutr Inst Workshop Ser*. 2016;86:11-27. 3. Gomes-Santos AC et al. *Cell Immunol*. 2015;298:47-53. 4. Holton TA et al. *J Proteome Res*. 2014;13:5777-5783. 5. Khalidi N et al. *J Agric Food Chem*. 2014;62:7225-7232. 6. Inuo C et al. *Int Arch Allergy Immunol*. 2018;177:259-268. 7. Van Berg A et al. *Allergy*. 2016;71:210-219. 8. Sauser J et al. *Int Arch Allergy Immunol*. 2017;177(2):123-134.

Preterm versus Term

Language abilities between 2-year-old children born preterm and term were investigated¹

- **Children born < 30 weeks showed specific deficits in social communication like joint attention and symbolic skills, a potential forerunner of autism spectrum disorder**
- Lower gestational age at birth, male sex, hearing loss and multi-lingualism may indicate poorer language scores

Cesarean delivery or not?

Cesarean delivery rate has increased both local and globally in the past decades² and a recent study suggested its impact on infant brain development via brain imaging³. Compared with infants born by cesarean delivery, those born virginally had³,

- **Better myelination** at ~ 3 months
- **Better white matter microstructural integrity and connectivity**

The Power of Delayed Cord Clamping

In a randomized controlled trial, neurodevelopment of term infants with delayed cord clamping (> 5 min) and immediate cord clamping (< 20 sec) was examined⁴,

- **Infants with delayed clamping had higher myelin content** in the internal capsule and brain regions related to motor, visual and sensory functions at 4 months
- No difference in Mullen testing was noted

Can sleeping influence?

A community-based study has demonstrated that sleep quality influenced cognitive abilities⁵,

- **Infant with nighttime awakenings for 2 times per night had significantly higher Mental Development Index (MDI) score** versus those without and with more nighttime awaking
- **Toddlers with nighttime awakenings for ≥ 3 times per night had significantly lower MDI** versus those with fewer nighttime awaking

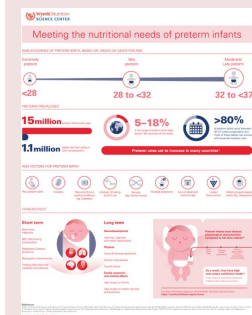
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Latest discoveries on human milk oligosaccharides (HMOs)

Danica Yau, Accredited Practising Dietitian (DAA), MSc, BSc (Hons)

While it is generally acknowledged that human milk oligosaccharides (HMOs) can be found in high abundance in human milk, **a recent study revealed for the first time that HMOs are present in amniotic fluid and that the fetus may be exposed to HMOs in utero already**¹. Four key HMOs including 2'-fucosyllactose (2'-FL), 3-fucosyllactose (3-FL), difucosyllactose (DFLac) and 6'-sialyllactose (6'-SL) were commonly found in urine samples collected before delivery (n = 48), human milk four days after birth (n = 48) and amniotic fluid during planned cesarean section or after spontaneous rupture of membrane (n = 8)¹. While these HMOs were detected at varying concentrations between samples, **2'-FL was the dominant type in all three sample types on average**¹.

As prebiotics, antimicrobial and antiadhesive effects have been previously described for HMOs, these study results suggest that **HMOs can possibly help to shape the amniotic fluid microbiome and optimize the environment**¹. They may also help to **fight infections and inflammation**, with the possibility to **reduce the risk of preterm delivery** according to the study investigators¹.

On the other hand, cesarean birth may be especially detrimental to microbiota of infants fed by mothers with the FUT 2 genotype who do not produce HMOs such as 2'-FL (non-secretors)². Comparing to vaginally born infants, cesarean-born infants in general had compromised microbiota in terms of diversity and abundance, where all magnitude of effects were greater in infants of non-secretor mothers². These results suggest that **combination of cesarean birth and lack of HMOs such as 2'-FL in feeding can profoundly alter the infant's microbiota, and this group may benefit from specific intervention such as supplementation with HMOs like 2'-FL**². This may be important locally as cesarean birth rate in Hong Kong has been high with 35%,^{3,4} and frequency of non-secretor phenotype in the Chinese population was estimated to be 30-50%⁵⁻⁷.



References: 1. Wise A et al. Front in Ped. 2018; 6: 270. 2. Korpela K et al. Nature. 2018; 8:13757. 3. Black M and Bhattacharya S. PLoS Med. 2018;15(10):e1002676. 4. Betran AP et al. PLoS ONE. 2016; 11(2):e0148343. 5. Elwakiel M et al. J agric Food Chem. 2018;66:7036-7043. 6. Erney R et al. J Pediatr Gastroenterol Nutr. 2000; 30:181-192. 7. Castranys-Muoz et al. Nutr Rev. 2013; 71:773-789.