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Update by Catharine Hart

Microbirth Summit: The Microbiome and Why it Matters in Maternity

In this piece Catharine Hart reports on the Microbirth Summit. The information she shares, while very interesting, may be challenging for some people and may raise questions for others. For example, in order to make a fully informed decision, the AIMS reader may want to know more about the risk/benefit balance of practices thought to promote a healthy infant microbiome, compared with practices thought to compromise it; they may want to know more about what constitutes a healthy microbiome and what evidence we have for this; and they may simply want to know (with helpful numbers) whether or not microbiomes really matter that much. Please read this report as a starting point for those questions, and look out for more on this topic in future issues. If you would like to share your thoughts on this topic, suggest ways in which this area of knowledge is likely to improve our maternity services, or tell us about anything you are doing or have seen being done to make such improvements, please contact me, the editor, at alex.smith@aims.org.uk.

In July, I attended a two week online microbirth summit hosted by Toni Harman (producer and director

of the 2014 film *Microbirth* and founder of the microbirth school[1]). The summit had presentations from this year's Microbirth virtual conference and live question and answer sessions.

The microbiome is a developing area of science and I found it absolutely fascinating to learn more about it. Some of the information that was shared just totally blew my mind - for example, we were told that there are more microbes inside our bodies than human cells - an estimated 38 trillion microbes, compared to 'only' around 30 trillion of our own cells!?

We started with a simple introduction. What is the human microbiome? It is simply a community of microorganisms (bacteria, archaea, protists, viruses or fungi) which live on or in the human body.[1] The two main microbiomes talked about in terms of maternity are usually the infant skin and gut microbiomes.

The microbiome is usually found in areas of the body which connect to the external environment, such as the skin, mouth and gut, which can also be entry points for infection. If there is a healthy microbiome, this can give more resistance to disease-causing microbes gaining a hold, preventing potentially serious infections. A healthy microbiome is thought to be really important for long term healthy development and for giving protection against some chronic diseases. Both *seeding* (colonising) and *feeding* the microbiome help to establish a healthy microbiome in newborn babies. Seeding usually happens when microbes are transferred during vaginal birth (from the mother's vagina and gut), during skin-to-skin contact and some microbes can also seed from breastmilk. Breast milk is also helpful for feeding the newborn's gut microbiome as it contains unique carbohydrates - human milk oligosaccharide sugars (HMOs) - which gut microbes feed on - in fact these sugars cannot be digested by human cells at all. We heard that there are certain skin microbes that are typical of the infant or maternal skin, and microbes that are associated with the mode of delivery (babies born by caesarean section typically have a different microbiome from babies born vaginally). If the baby's skin is not colonised by the mother's microbiome, it is much more likely to be colonised by other bacteria instead, which could include potentially disease-causing hospital bacteria if the baby is in hospital, for example.

Dr Nils Bergmann talked about Kangaroo Mother Care. First developed as an alternative to incubator care for low weight or preterm infants, Kangaroo Mother Care is usually defined as prolonged skin-to-skin contact, breastfeeding and early discharge home from hospital.[2, 3] However, according to UNICEF the importance of skin-to-skin contact immediately after birth applies to all babies for a number of reasons, only one of which is the microbiome. Establishing an emotional connection through skin-to-skin contact can also create feelings of trust and safety - rewiring both the baby's and mother's brain. The World Health Organization Baby Friendly Initiative promotes at least one hour of skin-to-skin contact following birth,[4] but Dr Bergmann emphasised that this should really last at least six hours for the baby and 20 hours for the mother's sake,[5] in terms of optimum brain rewiring.

With the aim of preventing later-onset chronic diseases. Dr Katri Korpela discussed possible ways of restoring a healthy microbiome in situations where colonisation may have been disrupted. These situations include caesarean birth, exposure to antibiotics, or a lack of breastfeeding. Various ways of

doing this as safely as possible have been studied, including giving probiotics alongside exclusive breastfeeding. Exclusive breastfeeding alone for babies born by caesarean section provides some microbes, but not enough for a full seeding, compared with vaginal birth. There have been some studies into faecal microbiota transplantation (using microbes from the mother's poo). In theory this can restore a normal infant gut microbiome, but because of possible pathogens not everyone is considered to be eligible for this and some may also not find it very acceptable. Seeding from a vaginal swab only partially restores the infant's gut microbiome because the vagina does not contain the main gut microbes, in fact in healthy women it is a deliberately hostile environment for them.

We heard that the immediate period after birth presents opportunities for adopting approaches to care that promote the normal establishment of the microbiome. Dr Michelle Irving discussed this and pointed out that postnatal care is often based on custom that has not been updated to reflect recent evidence about the microbiome, e.g. removing babies from the mother for routine procedures, which can disrupt the normal microbiome colonisation. We discussed ideas for lots of simple changes to care practices, which could help to prevent this disruption, at very little or no cost. It's important that birthworkers have access to up-to-date evidence about this topic and feel confident to deliver physiology-informed care at every birth, even when medical assistance is also welcome. Working with, rather than undermining, salutogenic processes,[6] for example, by offering women and birthing people the option to bring in their own towels or pillows from home to a hospital or birthing unit, postponing bathing the newborn or offering parents the option to put their own baby on the scales for weighing, maximises the baby's contact with the healthy family microbiome.

We also heard about responsive breastfeeding, how it involves responding to the baby's cues, recognising that feeds are not just for nutrition, but also for love, comfort and reassurance. This, we were told, secures optimal nutrition, immune system development, attachment and the development of positive feeding habits well into infancy. There was also a session on infant massage and how it can help support the infant microbiome by increasing skin colonisation, decreasing cortisol and increasing oxytocin levels.

Overall, the summit offered a fascinating series of sessions, which AIMS is reflecting on,[7] with the aim of developing a case study for our physiology informed maternity services campaign.

Watch this space next year for a future edition of the AIMS journal especially dedicated to supporting physiology and our campaign for physiology informed maternity services (aka PIMS!!)

Author Bio: Catharine Hart studied biology at the University of York and later trained as a midwife at the University of East Anglia. Catharine is currently a full-time mum, which she combines with her volunteer role at AIMS, working in the Campaigns Team. She lives with her family in Suffolk.

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1 Harman, T., & Wakeford, A. (2016). *The Microbiome Effect: How your baby's birth affects their future health.* Pinter & Martin Ltd. See also https://microbirth.com

2 World Health Organization Reproductive Health. (2003). Kangaroo mother care: a practical guide (No. 1). World Health Organization.

3 Stefani, G, et al. (2022), Why is kangaroo mother care not yet scaled in the UK? A systematic review and realist synthesis of a frugal innovation for newborn care, BMJ Innovations, 8(1): https://innovations.bmj.com/content/bmjinnov/8/1/9.full.pdf.

Please also see AIMS recent Evidence Submission to the House of Lords Preterm Birth Committee. www.aims.org.uk/campaigning/item/evidence-preterm-birth#ref23

4 UNICEF (2024) Skin-to-skin contact Skin-to-skin contact - Baby Friendly Initiative

5 Editor's note: These figures are in line with the World Health Organization's recommended 8-24 hours of skin to skin contact every day for small or premature babies.www.who.int/news/item/16-05-2023-new-resources-released-to-help-more-preterm-and-low-birthweight-babies-benefit-from-kangaroo-mother-care

6 Downe S, Meier Magistretti C, Shorey S, et al. The Application of Salutogenesis in Birth, Neonatal, and Infant Care Settings. 2022 Jan 1. In: Mittelmark MB, Bauer GF, Vaandrager L, et al., editors. The Handbook of Salutogenesis [Internet]. 2nd edition. Cham (CH): Springer; 2022. Chapter 43. Available from: www.ncbi.nlm.nih.gov/books/NBK584110/ doi: 10.1007/978-3-030-79515-3_43

Please also see AIMS journal issue on Salutogenesis:www.aims.org.uk/journal/item/editorial-salutogenesis

7 Editor's note: Reflection rather than immediate endorsement. or querying of unfolding knowledge and ideas. is important to AIMS.