Allergy and infant feeding guidelines in the context of resource-constrained settings

The World Health Organization and the United Nations Children's Fund both advise exclusive breastfeeding (EBF) in the first 6 months of life, despite the mother's HIV status. There is indisputable evidence that EBF in the first 6 months of life has benefits for the overall health of child and mother. This strategy has proven benefits in reducing the incidence of infant otitis media, lower respiratory tract infections, gastroenteritis and vertical HIV transmission. Early introduction of solids has the potential to increase the incidence of obesity, anaemia, diarrhoeal illness, and eczema.

However, studies in high-income countries have shown that early introduction of allergenic foods, such as peanuts, egg, sesame, wheat, cow's milk protein, prior to 6 months of age, has the potential to decrease the incidence of food allergies later in life. Early introduction of complementary foods, prior to 6 months of age, runs the risk of shortening the overall duration of breastfeeding.

In settings with a high burden of HIV and/or other infectious diseases and malnutrition, early introduction of complementary feeds may be detrimental to the overall health of the community. In these communities, families with high a incidence of atopy that might benefit from early introduction of allergenic foods, should be advised individually.

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Dysbiosis and probiotics in the ICU

Traditionally, clinicians have dichotomised bacteria into harmful pathogens and friendly commensals. With increasing recognition of the significance of the individuals' microbiome, this traditional way of thinking has been somewhat challenged. The microbiome is the collection of commensal organisms living on and within each of us. The impact of the microbiome on homeostasis and maintenance of our daily physiology is being recognised increasingly in the literature.

The intestinal microbiome is a complex entity that can be harmful if the equilibrium is disturbed — a process referred to as dysbiosis. Patients in the intensive care unit (ICU) are at particular risk of dysbiosis given the high rate of antibiotic use, dietary changes, and the stress of critical illness. This disruption is thought to potentiate a host of untoward effects. From another perspective, restoration of the microbiome in the form of probiotics is an avenue of much debate in recent literature. Probiotics are defined as living microbes of human origin that offer beneficial health effects to the host when ingested in sufficient quantities.

Research on the use of probiotics is challenging, as interpretation requires the consideration of many confounding factors, including the dose and type of probiotic to name a few. Furthermore, there is no standardisation across studies that would render it easier to interpret these findings.

Nonetheless, some noteworthy conclusions have been made regarding probiotic therapy, which has shown:

- 40 - 50% reduction in antibiotic-associated diarrhoea
- 60% reduction in rates of *Clostridium difficile* infection
- 20% reduction in overall ICU nosocomial infections
- 40% reduction in operative site infections and sepsis
- 25 - 40% reduction in the rate of ventilator-associated pneumonia
- reduction in the severity and mortality of necrotising enterocolitis.

The increase in research efforts in this field is bound to identify other benefits of probiotic therapy. Currently the optimal probiotic agent and its ideal dose cannot be standardised as there is too much variation between studies, but this area would most likely be more defined in the near future.

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Childhood asthma and the bacterial microbiota of the upper respiratory tract

The bacterial microbiota of the lower airways have been implicated in the pathogenesis of asthma, the severity of asthma, and the response to therapy. Unfortunately, it is impractical to sample the lower airway routinely to further define the association between the microbiome of the lower airways and asthma. It is plausible that sampling of the upper airway is likely to reflect lower airway samples. Considering the united airway hypothesis, it is justified to conclude that the upper and lower airways share physiological and pathological response patterns.

Previous studies have alluded to the fact that there might be an association between childhood wheeze and colonisation of the upper respiratory tract with certain pathogens, including *Haemophilus influenzae*, *Moraxella catarrhalis*, and *Streptococcus pneumoniae*.

Sampling of the lower airways involves bronchoalveolar lavage or bronchial brushings. Samples of the upper airway involve nasal and throat samples.

A recent cross-sectional study sampled 327 throat swabs and 68 nasal swabs from school-aged children, and looked at the correlation to childhood wheeze. The results were interpreted according to whether the children resided in a farming or non-farming area. Childhood wheeze was positively correlated to colonisation with a particular taxonomic unit of *Moraxella* (odds ratio = 3.78; 95% confidence interval 2.02 - 7.05). The association was only present in children not residing on farms. There was no association between bacterial load and farming exposure, or asthma status.

The study illustrated an association between *Moraxella* and asthma status; however, it is difficult to tease out cause and effect. It is possible that asthma renders a favourable environment for colonisation with *Moraxella,* or *Moraxella* in non-farm resident children predisposes to inflammation and childhood wheeze. Further studies are needed in this field.

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