

Abstract Submission Form

Title of Abstract: 'Human milk immune composition: from simplicity to complexity'

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Human milk (HM) is the earliest and the only one source of nutrition during first few weeks of life, a crucial period for infant immune system development and metabolic programming for lifelong health and development. At least it should be the only source of nutrition for the infant as suggested by the World Health Organisation (WHO), which recommends exclusive breastfeeding for at least 6 months in all infants ¹.

It is well established that breastfeeding confers protection against both, short- (e.g. reduced morbidity and mortality from neonatal infections) and long-term health outcomes (such as reduction in blood pressure, type 2 diabetes and increased IQ and better education in later life) ². Despite some high-quality research, there is conflicting evidence on the protective role of breastfeeding in relation to many non-communicable diseases, including those associated with immunological dysfunction.

It has been hypothesised that mixed results produced by scientists worldwide can be explained by variations in HM composition at individual and population levels as HM is known to contain a large variety of immune active components ³ which are present in differing concentrations ⁴. Which factors or combination of factors are able to provide sufficient influence on short and long-term health outcomes in infants is still a matter of discussion, despite a number of studies aimed to address this question.

Allergic diseases such as asthma, eczema, hay-fever and food allergy are the commonest chronic diseases of childhood in many countries, and there is evidence that early life events, such as variations in breastfeeding patterns, maternal diet, environmental and microbial exposures may be important in their development. There are still a number of hurdles to overcome before we come to a clear understanding on how to translate these associations into clinical practice, because association is not synonymous with cause and effect.

Variations in breast milk immune composition (and the infant's response to breast milk immune constituents) may also explain some of the conflicting results of studies evaluating

whether prolonged exclusive breastfeeding can prevent allergic disease ^{5 6}. Breast milk is a “soup” full of immune active factors, which potentially may influence immunological outcomes in infancy and early childhood. It contains not only hundreds of proteins, including a wide variety of cytokines, inflammatory mediators, signalling molecules, and soluble receptors ³ but also polyunsaturated fatty acids (PUFAs) ⁷ and comprises of a complex microbiome ⁸. Yet there is conflicting evidence on the relationship between maternal exposure to interventions, breast milk composition and immunological health outcomes.

In view of the large number of potentially immune-active constituents in breast milk, investigation of only a limited range of constituents may well produce conflicting results. There is a lack of studies, attempting to assess BM as a whole, rather than focusing on a single component.

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