

Breast milk and the first 1000 days of life

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Noncommunicable diseases (NCDs) underlie almost two-thirds of all global deaths worldwide ¹. NCDs are chronic diseases of major public health importance such as cardiovascular diseases, obesity, cancer, type 2 diabetes, degenerative and mental disorders, and allergies, that are mainly attributable to environmental factors. There is an urgent need to implement effective prevention strategies, because the future costs of diagnosis and treatment are likely to be unaffordable.

Converging direct and indirect evidence nowadays supports the hypothesis that the perinatal environment plays a major role in determining health conditions later in life ². Exposure to adverse environmental conditions during development triggers adaptations that have short- and/or long-term consequences for health and disease risk ³, and a suboptimal intrauterine or neonatal environment impairs the development of organs and functions, and may play an important role in programming chronic diseases in infancy and adulthood. For instance, advances in neuroscience and the physiology of stress are revealing the biological mechanisms underlying well-established associations between adverse conditions in early childhood and suboptimal life-course trajectories ⁴.

It is now widely accepted that the perinatal and early childhood periods – the so-called “First 1000 Days of Life”- represent a critical window of vulnerability to the environment, because the main fundamental biological and physiological processes are programmed for a lifetime during this period ^{5,6}. The early-life origin of NCDs is mediated through various mechanisms including developmental plasticity, programming and epigenetics. During development, epigenetic marks, such as DNA methylation, histone modifications and the expression of non-coding RNAs, undergo substantial changes.

The knowledge that in-utero and early childhood experiences affect the risk of NCD development provides a key opportunity to target interventions to the time windows in which they will have the most important effect.

Breastfeeding perfectly fits the concept that early-life interventions may have a significant impact on future health ⁷. Breastfeeding is associated with fewer NCDs such as allergic diseases ⁸, obesity ⁹ and inflammatory bowel disease as well as with lower systemic arterial pressure. In premature newborn infants and/or under conditions of psycho-social vulnerability, breastfeeding is associated with better long-term neurodevelopmental outcome ¹¹. Furthermore, breastfeeding promotes the health and wellbeing of the mother-baby dyad, and has analgesic effects in infants exposed to painful stimuli ¹². The breastfeeding promotion program is therefore the spearhead of this new paradigm highlighting the developmental origin of health and disease.

In this presentation, we will discuss the potential mechanisms by which breastfeeding - a brief nutritional intervention within the first 1000 days of life - may promote the future health.

References

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