Maternal and Child Nutrition: Importance of the First 1000 Days

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The first 1000 days range from conception to the end of the child's second year of life [1]. The first 1000 days of life are characterized by rapid growth and development, maturation of all organ systems, and establishment of metabolic patterns. Also, in this period the fastest rate of neurodevelopment of cognitive functions occurs [2]. It is important to focus on healthy nutrition and development during the first 1000 days which will have benefits throughout life [1]. Nutrition quality and quantity during the first 1000 days affect the risk of developing chronic and metabolic diseases [2]. Children should maintain an adequate nutrition through proper maternal diet, exclusive breastfeeding for the first 6 months, starting adequate complementary foods after 6 months, and continued breastfeeding for up to age 2 [1].

The first 1000 days is a critical period of developmental plasticity: the capacity to express specific adaptive responses to environmental experiences. It has been shown that during this sensitive period organisms are affected by nutritional, hormonal, and metabolic environmental experiences, and that these experiences lead to lifelong consequences for health and wellbeing [3]. Early-life nutritional experiences can permanently program the cells' and organs' structures, functions, and metabolism. Inappropriate metabolic and endocrine responses occur in organs like the brain, adipose tissue, muscle, liver, and pancreas. Structural and functional changes in the cells and organs due to changes in metabolic, neuroendocrine and immunologic responses, gene expression, and epigenetic mechanisms can cause fetal metabolic programming [2,4]. These factors affect growth, development and cognition, and the risk of cardiovascular diseases, metabolic disorders, allergies, and obesity [2].

Both low and high birth weights may lead to physiological and/or metabolic adaptations in vital organs, and may result in disruptions in normal growth and development [5]. Low birth weight is known to have important effects on a child's growth, development, and health status later in life. Stunting, greater susceptibility to infections, lower cognitive performance, and increased risk of adiposity, cardiovascular disease, diabetes mellitus, hypertension, and all-cause mortality happen more in low birth weight children in the long term. Higher birth weight has been shown to be associated with higher obesity, diabetes, and cancer risk in adult life. Therefore, prevention of both low and high birth weights through nutrition and health intervention is important during pregnancy [6].

It is known that maternal metabolism of obese women is altered in pregnancy, and off spring of obese mothers has a higher percentage of body fat. Maternal lifestyle, diet, body weight, and metabolism affect the utero metabolic environment which influences fetal metabolism, composition, metabolism and gene expression [7]. It is important to ensure a healthy and balanced diet during pregnancy to maintain the child's health throughout life. Also, both overweight and obese women that are planning to become pregnant have to lose their excess weight before pregnancy [8].

Another important issue in the first 1000 days that is related to nutrition is breastfeeding. Exclusive breastfeeding is recommended for the first 6 month of life, and then continued breastfeeding along with appropriate complementary foods for up to age 2 [8]. Human milk contains bioactive molecules like cells, immune factors, hormones,
References


