Abstract


Maternal Micronutrient Deficiency, Fetal Development, and the Risk of Chronic Disease.

Christian P, Stewart CP.

Center for Human Nutrition, Department of International Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD 21209.

BACKGROUND: Early life nutritional exposures, combined with changes in lifestyle in adult life, can result in increased risk of chronic diseases. Although much of the focus on the developmental origins of disease has been on birth size and growth in postnatal life and the availability of energy and protein during these critical developmental periods, micronutrient deficiencies may also play an important role in fetal growth and development.

SUMMARY: Micronutrient status in fetal and early life may alter metabolism, vasculature, and organ growth and function, leading to increased risk of cardiometabolic disorders, adiposity, altered kidney function, and, ultimately, to type 2 diabetes and cardiovascular diseases. This review elucidates pathways through which micronutrient deficiencies lead to developmental impairment and describes the research to date on the evidence that micronutrient deficiencies in utero influence the development of chronic disease risk. Animal studies, observational human studies examining maternal diet or micronutrient status, and limited data from intervention studies are reviewed. Where data are lacking, plausible mechanisms and pathways of action have been derived from the existing animal and in vitro models.

CONCLUSIONS: This review fills a critical gap in the literature related to the seminal role of micronutrients in early life and extends the discussion on the developmental origins of health and disease beyond birth size and energy and protein deficiency.

PMID: 20071652