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Milk and linear growth: programming of the igf-I axis and implication for health in adulthood.

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Abstract

There is increasing awareness that childhood circumstances influence disease risk in adulthood. As well as being strongly influenced by genes/genetic factors, stature acts as a marker for early-life exposures, such as diet, and is associated with risk of several chronic diseases in adulthood. Stature is also a marker for levels of insulin-like growth factor (IGF)-I in childhood. Levels of IGF-I are nutritionally regulated and are therefore modifiable. Milk intake in childhood and in adulthood is positively associated with higher levels of circulating IGF-I and, in children, higher circulating IGF-I promotes linear growth. Studies conducted by our team and others, however, indicate that the effect of milk is complicated because consumption in childhood appears to have long-term, programming effects which are opposite to the immediate effects of consuming milk. Specifically, studies suggest that the long-term effect of higher levels of milk intake in early childhood is opposite to the expected short-term effect, because milk intake in early-life is inversely associated with IGF-I levels throughout adult life. We hypothesize that this long-term programming effect is via a resetting of pituitary control in response to raised levels of IGF-I in childhood. Such a programming effect of milk intake in early life could potentially have implications for cancer and ischemic heart disease risk many years later.

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