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Milk consumption and the prepubertal somatotrophic axis

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Abstract

Background

Nutrients, hormones and growth factors in dairy foods may stimulate growth hormone (GH), insulin-like growth factor I (IGF-I), and raise the ratio of IGF-I to its binding protein, IGFBP-3. We conducted pilot studies in Mongolia and Massachusetts to test the extent to which milk intake raised somatotrophic hormone concentrations in prepubertal children.

Methods

In Ulaanbaatar, we compared plasma levels before and after introducing 710 ml daily whole milk for a month among 46 10–11 year old schoolchildren. In a randomized cross-over study in Boston, we compared plasma hormone levels of 28 6–8 year old girls after one week of drinking 710 ml lowfat (2%) milk with their hormone levels after one week of consuming a macronutrient substitute for milk.

Results

After a month of drinking whole milk, Mongolian children had higher mean plasma levels of IGF-I ($p < 0.0001$), IGF-I/IGFBP-3 ($p < 0.0001$), and 75th percentile of GH levels ($p = 0.005$). After a week of drinking lowfat milk, Boston girls had small and non-significant increases in IGF-1, IGF-1/IGFBP-3 and GH.

Conclusion

Milk drinking may cause increases in somatotrophic hormone levels of prepubertal girls and boys. The finding that milk intake may raise GH levels is novel, and suggests that nutrients or bioactive factors in milk may stimulate endogenous GH production.



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