Abstract


Maternal vitamin A supplementation and lung function in offspring.


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BACKGROUND: Vitamin A is important in regulating early lung development and alveolar formation. Maternal vitamin A status may be an important determinant of embryonic alveolar formation, and vitamin A deficiency in a mother during pregnancy could have lasting adverse effects on the lung health of her offspring. We tested this hypothesis by examining the long-term effects of supplementation with vitamin A or beta carotene in women before, during, and after pregnancy on the lung function of their offspring, in a population with chronic vitamin A deficiency.

METHODS: We examined a cohort of rural Nepali children 9 to 13 years of age whose mothers had participated in a placebo-controlled, double-blind, cluster-randomized trial of vitamin A or beta-carotene supplementation between 1994 and 1997.

RESULTS: Of 1894 children who were alive at the end of the original trial, 1658 (88%) were eligible to participate in the follow-up trial. We performed spirometry in 1371 of the children (83% of those eligible) between October 2006 and March 2008. Children whose mothers had received vitamin A had a forced expiratory volume in 1 second (FEV(1)) and a forced vital capacity (FVC) that were significantly higher than those of children whose mothers had received placebo (FEV(1), 46 ml higher with vitamin A; 95% confidence interval [CI], 6 to 86; FVC, 46 ml higher with vitamin A; 95% CI, 8 to 84), after adjustment for height, age, sex, body-mass index, calendar month, caste, and individual spirometer used. Children whose mothers had received beta carotene had adjusted FEV(1) and FVC values that were similar to those of children whose mothers had received placebo (FEV(1), 14 ml higher with beta carotene; 95% CI, -24 to 54; FVC, 17 ml higher with beta carotene, 95% CI, -21 to 55).

CONCLUSIONS: In a chronically undernourished population, maternal repletion with vitamin A at recommended dietary levels before, during, and after pregnancy improved lung function in offspring. This public health benefit was apparent in the preadolescent years.

PMID: 20463338