

Abstract

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Effects of dietary selenium on sperm motility in healthy men.

Hawkes WC, Turek PJ.

United States Department of Agriculture, Agricultural Research Service, Western Human Nutrition Research Center, University of California at Davis, USA.

BACKGROUND: A deficiency of dietary selenium leads to immotile, deformed sperm and infertility in rats, whereas supplementation of the diet with selenium compounds has been associated with both beneficial and deleterious effects on sperm function, depending on the chemical form of selenium.

METHODS: We conducted a randomized, controlled, and blinded intervention study on the effects of selenium in food on semen quality. Eleven healthy men were fed a controlled diet of foods naturally high or low in selenium for 120 days while confined in a metabolic research unit.

RESULTS: Dietary selenium was 47 microg/d for the first 21 days, then either 13 microg/d or 297 microg/d for 99 days, resulting in significant changes in selenium concentrations in blood and semen. Seminal plasma selenium concentration increased 50% with high selenium and decreased 40% with low selenium. The fraction of motile sperm in the high-selenium group decreased by 32% by week 13 and ended 18% lower than baseline. Selenium concentrations changed in seminal plasma but not in sperm, and serum androgen concentrations were unchanged in both groups, indicating this effect was neither androgen dependent nor caused by a change in the selenium supply to the testes. Serum triiodothyronine decreased and thyroid-stimulating hormone increased in the high-selenium group, suggesting that altered thyroid hormone metabolism may have affected sperm motility.

CONCLUSION: Although this decrease in sperm motility does not necessarily predict decreased fertility, the increasing frequency of selenium supplementation in the healthy population suggests the need for larger studies to more fully assess this potential side effect.

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