

# Selenium Supplements May Increase the Risk of Type 2 Diabetes

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Selenium, an antioxidant included in multivitamin tablets thought to have a possible protective effect against the development of type 2 diabetes, may actually increase the risk of developing the disease, an analysis by researchers at the University at Buffalo has shown.

Results of a randomized clinical trial using 200 micrograms of selenium alone showed that 55 percent more cases of type 2 diabetes developed among participants randomized to receive selenium than in those who received a placebo pill.

Results will appear in print in the August 2007 issue of *Annals of Internal Medicine* and were posted online on July 10.

Self-reported diagnosis of type 2 diabetes was a secondary endpoint in a clinical trial designed to test the benefit of selenium supplementation in prevention of non-melanoma skin cancer in areas in the Eastern U.S. where selenium levels are lower than the national average. Selenium is a trace mineral that is an essential component of proteins involved in antioxidant activity.

Saverio Stranges, M.D., Ph.D., first author on the diabetes prevention study, conducted the analysis while at UB, in cooperation with colleagues from Roswell Park Cancer Institute. He now is affiliated with the Clinical Sciences Research Institute, Warwick Medical School, Coventry, UK.

Stranges said the findings are very interesting, but should be considered cautiously.

"Among participants taking selenium supplementation, those who had the highest levels of selenium in their circulation at the beginning of the study had the highest risk of developing type 2 diabetes over the average 7.7 years of follow-up," he said, "and the increase in risk is unlikely to be a result of chance.

"However, in the general population, very few people, if any, take selenium supplements only, every day, for nearly eight years, so we can't be sure that these findings apply to the public at large.

"Perhaps the more important message is that a large proportion of the U.S. population, about 50 percent, takes multivitamins, even though there is no evidence that taking multivitamins helps prevent chronic disease among healthy people. In this country, we can get all the antioxidants we need in fruits and vegetables, but it's easier to take a vitamin than to eat a more healthy diet."

The selenium and diabetes study involved 1,202 people who did not have type 2 diabetes when they entered the cancer clinical trial at Roswell Park. Participants had been recruited for the main study between 1983 and 1991, and they were involved for an average of 7.7 years. The supplementation study was completed in February 1996.

Analysis for this diabetes study involved data from 600 persons who had taken selenium and 602 who were randomized to receive placebo pills.

Results showed that 97 participants developed type 2 diabetes during the study period, 58 in the selenium group and 39 in the placebo group. There was no difference in the findings when age, sex, smoking status and body mass index were included in the analysis.

"At the moment we don't know what mechanism or mechanisms account for this finding," said Stranges. "We have very little understanding of the possible biological pathways involved. In addition, our findings need to be replicated in larger clinical trials before conclusive evidence can be drawn on whether high doses of selenium supplements increase the risk of type 2 diabetes, as our study suggests.

"With selenium, which is a trace element, it may be the case that a little bit is essential, but more can cause detrimental effects, at least in well-nourished populations such as the U.S. It's possible that taking extra selenium overcomes the natural balance. Perhaps excess selenium has a negative effect on the endocrine system."

Source: University at Buffalo

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