Abstract

Titel: Selenium and incidence of type 2 diabetes – a systematic overview

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Background: Type 2 diabetes is a disease which causes vascular damage, stroke and premature death. Oxidative stress may play a role in the development of insulin resistance and diabetes. Selenium is a mineral involved in the protection against oxidative stress, and has been thought to be favorable in the prevention of the disease. However, this has changed since trials observed positive correlations between high selenium levels and incidence of type 2 diabetes.

Objective: To examine the studies that investigates selenium’s effect on the incidence of type 2 diabetes.

Search strategy: Searches have been done in PubMed and Scopus. Keywords used were: “Diabetes mellitus type 2” [MeSH] AND ”Selenium” [MeSH], ”Blood glucose” [MeSH] AND ”Selenium” [MeSH], ”Diabetes mellitus type 2” AND ”Selenium” AND ”Incidence”, ”Diabetes mellitus type 2” OR ”Non-insulin dependent” ”diabetes mellitus” + selenium, and ”Blood glucose” OR dysglycemia + selenium.

Selection criteria: Included studies were human studies in English/Swedish with RCT or cohort design with the aim to investigate the correlation between selenium and incidence of type 2 diabetes. Excluded studies were studies whose aim was to investigate the role of selenium in patients with existing diabetes. Studies regarding pregnant women, animals or children and with in vitro design were also excluded. Of the studies found in Scopus where MeSH terms were available, the ones who did not include relevant terms were excluded.

Data collection and analysis: Studies were collected according to the aforementioned criteria. They were analyzed with ‘Granskningsmall för randomiserad kontrollerad prövning’ made by SBU or with ‘Granskning- och dataextraktionsmall för kohortstudier’ from the University of Gothenburg.

Main results: Three studies were selected for this systematic overview. One of these was an RCT and two were cohort studies. The RCT and one of the cohort studies showed a positive correlation between a high selenium intake and incidence of type 2 diabetes. The third article came to an inverse conclusion, however it cannot be said to completely contradict the results from the other two studies, regarding the amounts of selenium investigated.

Conclusions: There is moderate evidence that selenium affects incidence of type 2 diabetes. Consumption of selenium above recommended intake is assumed to result in an increased risk to develop type 2 diabetes, with a positive exposure-response gradient. Plasma selenium around 1.32-1.44 μmol/L is suggested to implicate the lowest incidence of type 2 diabetes, and levels around 0.90 μmol/L and 2.40 μmol/L to increase the risk of the disease. More research is needed to determine optimal amounts of selenium considering type 2 diabetes.