Vitamin E supplementation and prostate cancer risk

SELECT trial finds no reduction and suggests an increase in risk of prostate cancer with either selenium or vitamin E supplements.

Overview: Prostate cancer is the second most common cancer in men in the UK after non melanoma skin cancer. Treatment costs and morbidity are high, making its prevention an important public health issue. Age is the most significant risk factor. More than half of all cases are diagnosed in men over 70, and it is quite rare in men under 50.

Eating a healthy diet can lower the risk of many cancers. However, there is currently little evidence about the effect of diet on prostate cancer risk. Preclinical and epidemiological studies had suggested that selenium and vitamin E (alone or in combination) might reduce the risk of developing prostate cancer by 60% and 30%, respectively. To explore this further the Selenium and Vitamin E Cancer Prevention Trial (SELECT) was set up.

In the US more than half of adults aged 60 and above take supplements containing vitamin E, and 23% take almost 18 times the recommended daily dietary allowance (Ford et al. 2005).

Current advice: There is no current guidance on the use of vitamin supplementation to help to prevent prostate cancer.

Vitamin E is an antioxidant which helps to protect cell membranes. It is found in a wide variety of foods, the richest sources being plant oils such as soya, corn and olive oil. The EU recommends a daily intake of 12mg. High potency products, with daily doses of 100mg or greater, can be sold without the supervision of a pharmacist. The Department of Health advises that taking up to 540mg of vitamin E supplements daily is unlikely to cause any harm.

New evidence: The SELECT trial was set up to determine the long-term effect of vitamin E and selenium on risk of prostate cancer in relatively healthy men (Klein et al 2011). A total of 35,000 men not suffering from prostate cancer at the time of trial entry were randomised to one of four treatments: selenium only, vitamin E only, selenium and vitamin E, and placebo at 400 sites across North America. The total follow-up was over 54,000 patient-years, and 521 additional cases of prostate cancer were detected.

The rate of prostate cancer detection was greater in all treatment groups when compared with placebo but was statistically significant only in the vitamin E alone group. The risk of prostate cancer at 7 years of median
follow up was increased by 17% in men randomised to supplementation with vitamin E alone, a
difference that started to appear about 3 years after randomisation.

The authors suggest that the observed 17% increase in prostate cancer incidence demonstrates the
potential for seemingly innocuous yet biologically active substances such as vitamins to cause harm.
The current findings of SELECT differ from findings of other large randomised intervention trials that
examined the effects of Vitamin E supplementation on prostate cancer risk.

Commentary: "Urological research continues to search for a chemopreventative agent for prostate
cancer.

"Due to the increasing UK incidence of prostate cancer, the frequent decision to implement radical
treatment even for low risk disease, and the high costs and morbidity of treatment itself, prevention is
a potentially exciting strategy. The SELECT Trial was designed to test two of the more promising
potential chemoprevetative agents, vitamin E and selenium; both individually and combined over a
long term follow-up of at least 7 years. This large, well conducted trial has shown that Vitamin E
increases the risk of a subsequent diagnosis of prostate cancer. The prostate cancer diagnosed was
mainly low risk disease (gleason Grade 6).

"This was an unexpected result as previously it was thought that Vitamin E might have a preventative
effect. The result will influence the advice given to men by GPs and urologists alike. It may also
impact on more general advice concerning dietary supplementation which is very common (up to
50%) in the study age-group (mainly men over 55).

"This is a good example of why properly designed and conducted randomised studies are needed to
evaluate the wide ranging and often over stated claims for the health benefits of vitamins and micro-
nutrients on the incidence of cancer and other important diseases." - Ben Challacombe, consultant
urological surgeon to Guy's and St Thomas' Hospitals.

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