



The Protective Role of Dietary Flavonoids Against Hormone-Related Cancers

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DESCRIPTION

Flavonoids, a diverse group of naturally occurring plant compounds, have garnered considerable interest for their potential health benefits, particularly their role in cancer prevention. These compounds, found abundantly in fruits, vegetables, tea, wine and other plant-based foods, are known for their antioxidant, anti-inflammatory and anti-carcinogenic properties. In recent years, there has been growing interest in understanding the link between dietary flavonoid intake and the risk of hormone-related cancers, such as breast, ovarian, prostate and endometrial cancers. Hormone-related cancers are influenced by fluctuations in hormones such as estrogen, progesterone and testosterone, which play significant roles in the initiation and progression of these malignancies. This article reviews findings from a population-based prospective cohort study examining the relationship between flavonoid consumption and the risk of hormone-related cancers.

Hormone-related cancers are those in which the development and progression are closely linked to hormonal imbalances or exposures. For example, breast and endometrial cancers are often driven by excessive estrogen exposure, while prostate cancer is influenced by testosterone. Flavonoids have been shown to modulate hormone metabolism, influence hormone receptor activity and reduce inflammation, all of which are mechanisms that could influence cancer risk.

Flavonoids are divided into several subclasses, including flavonols, flavones, flavanones, isoflavones, flavanols (also known as catechins) and anthocyanins. Each subclass has unique biological activities that may affect cancer risk. For instance, isoflavones, commonly found in soy products, are known to have estrogen-like properties and can bind to estrogen receptors, potentially modulating the effects of endogenous estrogen in hormone-sensitive tissues. Similarly, flavonols, present in foods such as onions, apples and tea, have been shown to inhibit aromatase, an enzyme involved in the production of estrogen, thereby potentially lowering the risk of estrogen-driven cancers.

The prospective cohort study under review involved a large, diverse population of adults who were followed for several years to assess their dietary flavonoid intake and the incidence of hormone-related cancers. Participants completed detailed dietary questionnaires at the outset of the study, which allowed researchers to estimate their flavonoid consumption based on their reported intake of flavonoid-rich foods. The cohort was then monitored for the development of hormone-related cancers and statistical analyses were conducted to determine the association between flavonoid intake and cancer risk, adjusting for potential confounding factors such as age, Body Mass Index (BMI), physical activity, smoking and family history of cancer.

The findings from this study suggest that higher dietary intake of certain flavonoid subclasses may be associated with a reduced risk of hormone-related cancers, particularly breast and prostate cancers. For breast cancer, the results indicated that women with the highest intake of flavonols and isoflavones had a significantly lower risk of developing the disease compared to those with the lowest intake. This protective effect was especially pronounced for Estrogen Receptor-Positive (ER+) breast cancer, a subtype that is particularly sensitive to estrogen levels.

For prostate cancer, the study found that men with higher intakes of flavanols and flavonols had a lower risk of developing the disease. Flavanols, found in foods such as green tea, cocoa and certain fruits, are known for their strong antioxidant properties, which may help protect prostate cells from oxidative damage and inflammation two key processes in cancer development. The anti-inflammatory effects of flavonoids could also play a role in reducing prostate cancer risk, as chronic inflammation in the prostate has been linked to increased cancer risk. Additionally, flavonoids may help modulate androgen metabolism, another key factor in prostate cancer development.

CONCLUSION

This population-based prospective cohort study indicates that a higher dietary intake of specific flavonoids, particularly

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flavonols, flavanols, and isoflavones, may be linked to a lower risk of hormone-related cancers, with breast and prostate cancers showing a particularly strong association. Flavonoids may exert their protective effects by modulating hormone metabolism, reducing oxidative stress and lowering inflammation key processes involved in cancer development. While these results

are encouraging, they underscore the importance of a balanced diet rich in plant-based foods as part of an overall strategy for cancer prevention. More research is needed to further elucidate the role of flavonoids in hormone-related cancers and to explore their potential as part of dietary interventions aimed at reducing cancer risk.