

The Role of Nutrition in Managing Uterine Fibroids

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Uterine leiomyomas, also known as uterine fibroids (UFs), are the most commonly encountered tumors among women of reproductive age¹. These benign growths have a complex etiology involving various factors such as genetics, inflammation, hormones and others¹. Managing and treating UFs has been an area of increasing interest, with a focus on conservative approaches¹.

While hormonal and surgical treatments are commonly used, they can be associated with potential side effects and complications¹.

Epidemiological evidence suggests that specific dietary components and nutrition have the potential to influence hormone-related diseases, potentially including the formation and growth of fibroids².

DIETARY FAT, MEAT, AND FISH

Recent studies, such as the Nurses' Health Study II conducted on premenopausal women, have shown an inverse association between total omega-3 polyunsaturated fatty acids (PUFAs) and the onset of myomas². Omega-3 fatty acids have been observed to remodel membrane architecture and downregulate the expression of genes involved in mechanical signaling and lipid accumulation in leiomyoma cells^{2,3}.

Additionally, it found a positive association between trans fatty acids and myoma development². Trans fats influence the levels of interleukin 6 (IL-6) and other inflammatory markers, indicating their potential role in promoting inflammation³.

Lower fat consumption has been associated with reduced serum estradiol levels, while higher fat intake has been linked to increased T-helper cytokines, which can promote chronic systemic inflammation or the growth of fibrous tissue and smooth muscles².

A significant intake of red meat may increase the risk of fibroids³.

FRUIT AND VEGETABLE INTAKE

Literature suggests that higher fruit and vegetable intake is associated with a lower risk of developing uterine myomas¹⁻³. This protective effect could be attributed to the presence of dietary phytochemicals found in fruits and vegetables, which can modulate various aspects of myoma pathogenesis, including extracellular matrix deposition, cell proliferation and angiogenesis². Consuming a diet rich in fruits and vegetables, which are sources of carotenoids, polyphenols, quercetin, and indole-3-carbinol, can have beneficial effects in patients with UFs¹. These natural substances have been shown to modulate oxidative stress, protect against inflammation and potentially influence UF development¹.

Active compounds derived from plants have also been investigated for their potential in treating UFs¹. Polyphenol found in green tea have antioxidant properties and are commonly consumed in Asian countries¹.

The strawberry extract has been shown to increase apoptosis and reactive oxygen species in leiomyoma cells, as well as reduce the extracellular acidification rate and the expression of certain genes associated with myoma growth². They possess various beneficial properties, including anti-inflammatory, antioxidative, antiproliferative, and genomic-protective effects³.

Curcumin, a major curcuminoid in turmeric, has been shown to possess antioxidant, anti-inflammatory, anticarcinogenic, and immunoregulatory activity, potentially protecting against the formation and growth of uterine myomas^{1,2}. Quercetin and indole-3-carbinol, derived from vegetables and onions, respectively, have demonstrated antifibrotic and antimigratory effects on uterine leiomyomas^{1,2}.

Lycopene, a carotenoid present in tomatoes, has been associated with a decrease in the incidence and size of leiomyomas².

Studies have shown that resveratrol, found in grapes and red wine, can suppress the growth of leiomyomas and reduce the expression of proteins associated with extracellular matrix remodeling².

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DAIRY PRODUCTS INTAKE

Milk components, such as calcium, vitamin D, butyric acid and milk proteins, seem to have antiproliferative effects on myoma cells^{2,3}. However, it's important to note that milk may also contain estrogen and progesterone, which could potentially increase the risk of hormone-dependent tumors^{1,3}.

VITAMINS INTAKE

A vitamin A-enriched diet and synthetic retinoid analogs may have preventive effects or limit the growth of fibroids¹. However, caution should be exercised with alpha-tocopherol, as it acts as a phytoestrogen and can modulate estrogen receptors involved in UF etiology¹. It may be advisable to avoid alpha-tocopherol in UF therapy¹. Lycopene has antioxidant and provitamin A activity, potentially reducing the number and size of leiomyomas¹. Retinoids, either natural or synthetic derivatives of vitamin A, have shown effects such as reducing inflammation, regulating cell growth, and proliferation and inhibiting carcinogenesis¹.

Tomato-based products, rich in lycopene, folate, vitamin C, vitamin A, and flavonoids, can be particularly beneficial in leiomyoma treatment¹. Vitamins C and E act as antioxidants, protecting cell membranes and DNA from oxidative stress¹.

Vitamin D plays a multifaceted role in modulating uterine myoma growth². Vitamin D has demonstrated potent antitumor effects and has been shown to inhibit UF cell proliferation and reduce UF size¹⁻³. The mechanisms by which vitamin D exerts its anti-UF effects include the induction of DNA repair genes and the mitigation of DNA damage in both UF cells and myometrial cells at risk of developing fibroids¹⁻³. Furthermore, vitamin D exhibits antiestrogenic and

antiprogesterone activities by reducing the expression of estrogen and progesterone receptors². It may also inhibit the activation of the wnt/ β -catenin pathway and play a role in DNA repair networks, which contribute to the suppression of uterine myoma growth².

MICRO- AND MACRO-ELEMENTS INTAKE

Micro- and macro-elements such as selenium have been implicated in the antioxidant function and potential effects on uterine leiomyomas¹. Among trace elements, selenium has shown efficacy in preventing and treating fibroids¹. However, the presence of heavy metals in food containers can increase the risk of myoma and stimulate fibroid growth¹.

In conclusion, there is a growing body of evidence supporting the role of dietary factors, nutrient deficiencies and specific vitamins and compounds in UF development and management¹. A diet rich in fruits, vegetables, and dairy products, along with proper supplementation, may offer potential benefits in reducing the risk of fibroids, inhibiting tumor growth and improving symptoms and quality of life for affected individuals¹.

REFERENCES

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