

Clinical Update

Tocotrienol build-up in tumors has major anti-cancer benefits

Tocotrienols, members of the vitamin E family, may exert their anti-cancer benefits by accumulating in cancer cells and delaying tumor growth, says a new study from Japan.

(Journal of Nutritional Biochemistry, 2009)

Both gamma- and delta-tocotrienols may accumulate in cancer cells, and promote the death of the tumours, according to data from *in vitro* and *in vivo* studies by researchers from Kyushu University. The potential anti-cancer benefits of tocotrienols are not new, but the Japanese researcher claim that their study is the first to show accumulation of the compounds in cancer cells.

There are eight forms of vitamin E: four tocopherols (alpha, beta, gamma, delta) and four tocotrienols (alpha, beta, gamma, delta). Alpha-tocopherol is the main source found in supplements and in the European diet, while gamma-tocopherol is the most common form in the American diet. Tocotrienols (TCT) are only minor components in plants, although several sources with relatively high levels include palm oil, cereal grains and rice bran.

While the majority of research on vitamin E has focused on alpha-Toc, studies into tocotrienols account for less than 1% of all research into vitamin E.

The Japanese researchers studied the effects of gamma- and delta-tocotrienol on mouse cancer cells (murine hepatoma MH134) both *in vitro* and *in vivo*. For the cell study, the tumour cells were cultured in the tocotrienols, and they found that the delta-version inhibited cell growth more than the gamma-type. This was related to an induction of apoptosis (programmed cell death).

For the animal studies, the researchers used C3H/HeN mice and implanted the tumour cells. The animals were then fed a normal diet, or the diet supplemented with 0.1 per cent gamma-tocotrienol or 0.1 per cent delta-tocotrienol for four weeks.

At the end of the study, a significant delay in tumour growth was observed for both groups supplemented with the tocotrienols. No effects on body weight were recorded.

In terms of the added that the tocotrienols had no effect on levels of immunoglobulin levels in the animals, suggesting that the tocotrienols' potential anti-cancer benefits were not related to immune function.

Source: www.nutraingredients.com