

Nuts against breast cancer

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A clinical study reports that, for women who have developed breast cancer, the daily consumption of walnuts controls the expression of several genes involved in the progression of these tumors.



EXCEPTIONAL FRUITS

Nuts are actually oleaginous fruits, i.e. fruits that contain a high proportion of fatty substance in the form of oil. All of these fruits are exceptional foods, not only due to their fatty contents being unsaturated (including a high proportion of linolenic acid, an omega-3 fatty acid) and thus good for the heart, but also because they represent an excellent source of several vitamins and minerals (vitamin E, manganese), of fibres as well as of anti-inflammatory and antioxidant phytochemical compounds.

The importance of regularly consuming nuts is clearly shown by the results of a very large number of studies demonstrating that these fruits significantly diminish the risk of several chronic diseases and of premature death. For example, a meta-analysis of 29 studies which have been carried out on this issue showed that daily consumption of nuts (28 g per day) led to diminutions of 20% in the risk of cardiovascular disease, 15% in the risk of cancer, 40% for type 2 diabetes and 22% in the risk of premature death¹. The effect of nuts on health is thus considerable: on a global scale, it is estimated that 4.4 million premature deaths are due to an insufficient consumption of nuts.

ANTICANCEROUS NUTS

Regarding cancer, the population studies performed to date suggest an anti-cancer effect for nuts against cancers of the colon, uterus, lung and pancreas. The preclinical data also suggest that these fruits can influence the progression of breast cancer. For example, it has been shown that nut extracts reduce the proliferation of breast cancer cells and that the inclusion of nuts in the diet of mice bearing cancerous tumors of human origin leads to a significant reduction in the tumor burden².

An inhibitory effect of nuts on the progression of breast cancer is also suggested by the effects of a pilot clinical study performed with women recently diagnosed with breast cancer³. In this study the researchers recruited women who had exhibited a breast lump and who had then undergone a biopsy to confirm the presence of a cancerous tumor. After the biopsy, the patients were separated into two groups: a control group, without any intervention, and a “nut group” in which the women consumed two ounces (about 50 g) of walnuts each day up until the day of surgery to remove the cancerous mass, usually about two weeks after biopsy. Samples of the tumor masses were removed at both the initial biopsy as well as during the surgery and were used to examine, at a molecular level, the phenomena affected by the consumption of nuts.

Analysis of the RNA expression profile (a method which displays the expression levels of genes) showed that the consumption of nuts was associated with differences in expression of 456 genes, amongst which were several known to play important roles in tumor progression. For example, the researchers noted that the patients who had daily consumed nuts showed the highest levels for certain genes involved in the process of apoptosis, a form of cellular death that is very important in restraining the development of tumors. In parallel, the levels of several genes essential to the growth and migration of cancer cells were diminished by the consumption of nuts. Overall, these observations indicate that the nuts exert a positive influence on several molecular processes involved in the growth of mammary tumors, which suggests that the daily consumption of these fruits could reduce the risk of developing this disease or could at least diminish the risk of recurrence.

- (1) Aune D et al. Nut consumption and risk of cardiovascular disease, total cancer, all-cause and cause-specific mortality: a systematic review and dose-response meta-analysis of prospective studies. *BMC Med.* 2016; 14: 207.
- (2) Hardman WE and Ion G. Suppression of implanted MDA-MB 231 human breast cancer growth in nude mice by dietary walnut. *Nutr. Cancer* 2008; 60: 666-674.
- (3) Hardman WE et al. Dietary walnut altered gene expressions related to tumor growth, survival, and metastasis in breast cancer patients: a pilot clinical trial. *Nutrition Research.* 2019; S0271-5317(18): 31190-31194