



Ascorbate supplementation inhibits growth and metastasis of B16FO melanoma and 4T1 breast cancer cells in vitamin C deficient mice

J. Cha, M.W. Roomi, V. Ivanov, T. Kalinovsky, A. Niedzwiecki, and M. Rath
International Journal of Oncology 2013, 42: 55-64

The aim of this study was to determine the effects of vitamin C supplementation on tumor growth, potential of cancer metastasis if cancer cells and other physiological parameters relevant to cancer in a unique strain of mice, which lost their ability to produce vitamin C.

Humans are one of the very few species who cannot produce internal vitamin C, which is an essential micronutrient in strong collagen formation; it has strong antioxidant properties and is required for many other functions in the body. Chronic deficiency of vitamin C is already present in cancer patients, which is further aggravated by multiple factors such as treatment side effects, poor diet, and poor nutrient absorption.

Therefore, in this study we evaluated the effects of vitamin C supplementation on development of breast cancer in this special type of mice that resemble humans concerning vitamin C deficiency. We found that unlike the control group of mice, the vitamin C supplemented mice developed smaller tumors by 28%, with fewer areas of necrosis. Furthermore, the tumors were also surrounded by a dense collagen capsule, which significantly reduced the chance of cancer cells escaping and metastasizing.

Overall connective tissue disintegration and extensive inflammation is commonly seen in cancer patients, manifested by weight loss, fatigue, and cachexia (muscle wasting). This study showed that the vitamin C supplemented mice did not lose weight and their levels of an inflammatory marker (IL-6) was 85% lower than that of the control group of mice.