Inhibition of Tumor Growth of Human Breast, Prostate, Colon, and Melanoma Cancer Xenografts by Nutrient Synergy in Nude Mice (2003)

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Abstract

Introduction:
Recent *in vitro* studies carried out in our laboratory have demonstrated that Nutrient Synergy (NS), a unique formulation composed of lysine, proline, arginine, ascorbic acid and EGCG exert a chemo preventive effect in several types of cancers including breast, prostate, colon, melanoma, and a number of others. NS was shown to have a potential synergistic anticancer activity by inhibiting MMPs, key enzymes in tumor cells invasion, metastasis and angiogenesis.

Objective:
This prompted us to investigate the effect of NS inhibition on growth of human cancer xenografts in nude mice.

Method:
After housing for a week, female nude mice 5-6 weeks old were placed in Group I and male nude mice 5-6 weeks old were divided into five groups, Groups II-VI. Each group consisted of 6 mice. Male mice were inoculated subcutaneously with 3x106 cancer cells in 0.2 ml of PBS and 0.1 ml of Matrigel: Group II, prostate cancer cells PC-3; Group III colon cancer cells HCT 116; Group IV, melanoma cells A2058; Group V, fibrosarcoma HT 1080; Group VI, synovial sarcoma Hs 701.T. Female mice (Group I) were inoculated with 3x106 breast cancer cells MBA-MD-231 in 0.2ml PBS and 0.1 ml Matrigel. After injection, each group was randomly divided into two subgroups, A and B. From day one, Groups IA-VIA were fed a regular diet and Groups IB-VIB were fed regular diet supplemented with 0.5% Nutrient Synergy. After the mice were fed their respective diets for four weeks, serum levels of ascorbic acid, lysine and proline were obtained, the mice were sacrificed, and their tumors were excised, weighed, and processed for histology.

Results:
NS inhibited the growth and reduced the size of the tumors in nude mice: breast cancer by 27%, synovial sarcoma by 44%, prostate cancer by 53%, melanoma by 57% , fibrosarcoma by 59%, and colon cancer by 63%. Histological examination revealed that NS decreased the mitotic index.

Conclusions:
Our results suggest that NS strongly suppressed the growth of tumors without any negative effects on various health aspects, and is an excellent candidate for clinical development against tumor. Currently we are investigating the mechanisms of reduced tumor growth.

Comment:
This study demonstrated the synergistic anticancer effect of lysine, proline, arginine, ascorbic acid and EGCG (from green tea extract) on human breast, colon, prostate, melanoma, fibrosarcoma, and synovial sarcoma cancer cell growth in nude mice without any adverse effects. This implies that Nutrient Synergy has great potential as a safe but effective therapeutic regimen for cancer treatment.