

Dietary Lycopene and Disease Risk Colorectal Cancer Critical Findings

| Disease type | First Author | Study Title and Complete Citation | Date | Abstract | Study Type | G.Tom +, N, - | P.Tom +, N, - | F.Tom +, N, - | Lyco +, N, - | Other +, N, - |
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| Cancer: colorectal | Pappalardo G | <p>Plasma (carotenoids, retinol, alpha-tocopherol) and tissue (carotenoids) levels after supplementation with beta-carotene in subjects with precancerous and cancerous lesions of sigmoid colon.</p> <p>Pappalardo G, Maiani G, Mobarhan S, Guadalaxara A, Azzini E, Raguzzini A, Salucci M, Serafini M, Trifero M, Illomei G, Ferro-Luzzi A.</p> <p>Eur J Clin Nutr. 1997 Oct;51(10):661-6.</p> | 1997 | <p>OBJECTIVES: (1) To compare tissue and plasma carotenoids status of healthy subjects and subjects with pre-cancer and cancer lesions; (2) to evaluate the effect of beta-carotene supplementation on the concentrations of other carotenoids in tissue (luteine + zeaxanthin, cryptoxanthin, lycopene, alpha-carotene) and in plasma and also retinol and alpha-tocopherol levels.</p> <p>DESIGN: Eighteen subjects were divided into three groups on the basis of colonoscopy and histological analytical findings: four healthy subjects (control group A); seven subjects affected by adenomatous polyps (group B with pre-cancer lesions); seven subjects suffering from colonic cancer (group C). Blood and colonic biopsy samples were taken (of colon and rectal mucosa) before and after beta-carotene supplementation in all subjects. Groups A and B received a daily dose of beta-carotene (30 mg/die) for 43 d. Group C's supplementation was terminated at the time which was performed, usually within 15 d. The tissue and plasma concentration of carotenoids, retinol and alpha-tocopherol were determined by high-performance liquid chromatography.</p> <p>RESULTS: The tissue concentrations of each carotenoid were similar in all the intestinal sites examined as regards groups A and B, although there was a high degree of intra individual variability within each group. Only beta-carotene made significant increases ($P < 0.001$) after supplementation. The subjects with cancer show tissue levels for each carotenoid lower than those of healthy subjects or subjects with polypous. The plasma levels of alpha-tocopherol did not change after supplementation while significant increases were noted of retinol, alpha-carotene ($P < 0.01$) and of beta-carotene ($P < 0.001$).</p> <p>CONCLUSIONS: The patients with colonic cancer seemed to undergo a significant reduction in their antioxidant reserves</p> | CC | | | | (-) | <p>weakness small study</p> <p>no regression analysis</p> |

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| | | | | with respect to the normal subjects and or polyps. We can confirm that oral B-carotene supplementation induces also an increase in plasma alpha-carotene in all groups. | | | | | | |
| Cancer: colorectal | Erhardt JG | Lycopene, beta-carotene, and colorectal adenomas. Erhardt JG, Meisner C, Bode JC, Bode C. Am J Clin Nutr. 2003 Dec;78(6):1219-24. | 2003 | <p>BACKGROUND: Epidemiologic studies found that high tomato intakes reduce the risk of colorectal cancers. This beneficial effect is assumed to be caused by high intakes of lycopene, a carotenoid with strong antioxidant activity that is present predominantly in tomatoes.</p> <p>OBJECTIVE: We assessed the relation between plasma lycopene concentrations and colorectal adenomas, the precursors for most colorectal cancers. In addition, the concentrations of 2 other antioxidants, beta-carotene and alpha-tocopherol, were measured.</p> <p>DESIGN: White subjects undergoing a complete colonoscopy were included in the study (73 with adenomas, 63 without any polyps, and 29 with hyperplastic polyps). A detailed dietary history and information on alcohol consumption and smoking habits were collected from all subjects. Plasma lycopene, beta-carotene, and alpha-tocopherol concentrations were measured by using HPLC.</p> <p>RESULTS: Patients with adenomas and control subjects without polyps did not differ significantly in body mass index; intakes of energy, fat, protein, carbohydrates, fiber, beta-carotene, and alcohol; or prevalence of smoking, but patients with adenomas were slightly older. The median plasma lycopene concentration was significantly lower in the adenoma group than in the control group (-35%; P = 0.016). The median plasma beta-carotene concentration also tended to be lower in the adenoma group (-25.5%), but the difference was not significant. In the multiple logistic regression, only smoking (odds ratio: 3.02; 95% CI: 1.46, 6.25; P = 0.003) and a plasma lycopene concentration < 70 microg/L (odds ratio: 2.31; 1.12, 4.77; P = 0.023) were risk factors for adenomatous polyps. Patients with hyperplastic polyps did not differ significantly from control subjects in any variable.</p> <p>CONCLUSION: Our findings support the hypothesis that lycopene contributes to the protective effect of high tomato intakes against the risk of colorectal adenomas.</p> | CC | | | | (-) ↑ risk in adenoma group if ↓ plasma [lyco] | |
| Cancer: colorectal | Ito Y | Cancer mortality and serum levels of carotenoids, | 2005 | A total of 3,182 subjects (1,239 males and 1,943 females) aged from 39y to 79y, were recruited from the inhabitants of a rural area in Japan who participated in health check-up programs | PC | | | | (-) ↓ risk with | |

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| | | <p>retinol, and tocopherol: a population-based follow-up study of inhabitants of a rural area of Japan.</p> <p>Ito Y, Kurata M, Hioki R, Suzuki K, Ochiai J, Aoki K.</p> <p>Asian Pac J Cancer Prev. 2005 Jan-Mar;6(1):10-5.</p> | | <p>from 1988 to 1995. During the 10.5 year follow-up, 287 deaths (175 males and 112 females) from all causes, 134 (81 males and 53 females) from cancer of all sites, 31 from lung cancer, 21 from colorectal cancer, 20 from stomach cancer, and 62 from other cancers, were identified among the cohort subjects. Fasting serum samples were taken at the time of the health check-ups, and serum levels of carotenoids, retinol and tocopherols were separately determined by HPLC. Statistical analyses were performed using Cox's proportional hazard model after adjusting for sex, age, and other confounding factors. High serum levels of alpha- and beta- carotenes and lycopene were found to marginally significantly or significantly reduce the risk for mortality rates of cancer of all sites and of colorectal cancers. High serum levels of beta-cryptoxanthin also showed an inversely relation with the risk of mortality from lung and stomach cancers, but this was not statistically significant. High intake of green-yellow vegetables contributing to serum levels of alpha- and beta- carotenes, as well as lycopene, may reduce the risk of cancer mortality, especially from colorectal cancer, in rural Japanese.</p> | | | | | <p>↑ serum [lyco]</p> | |
| <p>Cancer: colorectal</p> | <p>Leung EY</p> | <p>Vitamin antioxidants, lipid peroxidation, tumour stage, the systemic inflammatory response and survival in patients with colorectal cancer.</p> <p>Leung EY, Crozier JE, Talwar D, O'Reilly DS, McKee RF, Horgan PG, McMillan DC.</p> <p>Int J Cancer. 2008 Nov 15;123(10):2460-4.</p> | <p>2008</p> | <p>Both the tumour growth and progression and the systemic inflammatory response have the potential to increase oxidative stress. We therefore examined the relationship between lipid-soluble antioxidant vitamins, lipid peroxidation, the systemic inflammatory response and survival in patients with primary operable (n = 53) and advanced inoperable (n = 53) colorectal cancer. Compared with those patients with primary operable colorectal cancer, patients with unresectable liver disease had significantly lower median concentrations of alpha-tocopherol (p < 0.001), lutein (p < 0.001), lycopene (p < 0.001), alpha-carotene (p < 0.01) and beta-carotene (p < 0.001) and higher malondialdehyde concentrations. An elevated systemic inflammatory response (Glasgow prognostic score, mGPS) was associated with a greater proportion of females (p < 0.05) and more advanced tumour stage (p < 0.05), lower circulating levels of retinol (p < 0.01), lutein (p < 0.01), lycopene (p < 0.01) and alpha- (p < 0.01) and beta-carotene but not MDA (p = 0.633). In the liver metastases group 41 patients died of their cancer and a further 1 patient died of intercurrent disease on follow-up. On univariate survival analysis, mGPS (p < 0.01), retinol (p < 0.001), alpha-tocopherol (p < 0.05) and alpha-carotene (p < 0.05) were associated significantly with cancer-specific survival. On multivariate survival analysis of these significant variables, only mGPS (p < 0.01) and retinol (p < 0.001) were</p> | <p>CC</p> | | | | <p>N</p> <p>↓ lyco in inop group</p> | |

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| | | | <p>independently associated with cancer-specific survival. The results of the present study showed that the systemic inflammatory response was associated with a reduction of lipid-soluble antioxidant vitamins, whereas advanced tumour stage was associated with increased lipid peroxidation in patients with colorectal cancer. Of the antioxidant vitamins measured, only retinol was independently associated with cancer-specific survival. (c) 2008 Wiley-Liss, Inc.</p> | | | | | | |
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