

Plasma/Serum Lycopene and Disease Risk

Cervical 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, -
Cancer: cervical	Potischman N	<p>A case-control study of nutrient status and invasive cervical cancer. II. Serologic indicators.</p> <p>Potischman N, Herrero R, Brinton LA, Reeves WC, Stacewicz-Sapuntzakis M, Jones CJ, Brenes MM, Tenorio F, de Britton RC, Gaitan E.</p> <p>Am J Epidemiol. 1991 Dec 1;134(11):1347-55.</p>	1991	<p>A study of 387 cases and 670 controls from four Latin American countries evaluated the hypothesis that lower serum levels of eight micronutrients were associated with a higher risk of invasive cervical cancer. The serologic analyses were restricted to a sample of subjects with stage I and II disease to minimize effects of the disease on the serologic markers. Ninety-four percent of eligible subjects donated blood samples, which were analyzed for carotenoids, retinol, and tocopherols by high-pressure liquid chromatography. Cases did not differ significantly from controls in mean serum levels of retinol, cryptoxanthin, lycopene, alpha-carotene, lutein, or alpha-tocopherol. The mean level of beta-carotene was lower and the mean level of gamma-tocopherol was higher among cases as compared with controls. After adjustment for age, study site, sexual and reproductive behavior, socioeconomic status, screening practices, detection of human papillomavirus types 16/18, cholesterol, and triglycerides, a trend of decreasing risk was associated with higher levels of beta-carotene (p for trend = 0.05), with the adjusted odds ratio decreasing to 0.72 for the highest versus the lowest quartile. beta-Carotene results were similar by stage of disease, which argues against an effect of disease progression on nutrient values. Unexpectedly, increasing risks were observed as the level of gamma-tocopherol increased (odds ratio = 2.09; p for trend = 0.03); however, levels were higher among stage II cases as compared with stage I cases, suggesting a metabolic alteration resulting from the disease process. The concordance in the strength and direction of the blood and dietary results, presented in the accompanying report (Herrero R, Potischman N, Brinton LA, et al., American Journal of Epidemiology 1991;134:1335-46), supports a role for beta-carotene or foods rich in beta-carotene in the etiology of cervical cancer. This study also</p>	CC				N	

				indicates that simultaneous analysis using serologic and dietary nutrient indicators allows better discrimination of the association.						
Cancer: cervical	VanEenwyk J	Dietary and serum carotenoids and cervical intraepithelial neoplasia. VanEenwyk J, Davis FG, Bowen PE. Int J Cancer. 1991 Apr 22;48(1):34-8.	1991	A case-control study examined the association between cervical intra-epithelial neoplasia (CIN) and serum and dietary alpha-carotene, beta-carotene, cryptoxanthin, lutein, and lycopene. Cases (n = 102) had biopsy confirmed CIN I, II or III. Controls matched for age, ethnic origin and clinic (n = 102) had normal Pap smears. Participants completed health history and food frequency questionnaires. Fasting venous blood samples were assayed for serum carotenoids. Multivariable conditional logistic regression analyses yielded odds ratios and 95% confidence intervals (CIs) for those in quartiles 3, 2, and 1 (lowest) compared to quartile 4 (highest) of serum lycopene of 3.5 (1.1-11.5), 4.7 (1.2-17.7) and 3.8 (1.1-12.4), respectively. Similar analyses yielded adjusted odds ratios (ORaS) and 95% CIs of 4.6 (1.1-19.7), 5.8 (1.6-21.3) and 5.4 (1.3-23.3) for dietary intake of lycopene. The findings for lycopene-rich foods (tomatoes) were consistent with this result. CIN was not associated with the lutein. Findings for alpha-carotene, beta-carotene and cryptoxanthin were ambiguous. Quartile of vitamin C intake was also inversely associated with CIN with ORaS and 95% CIs of 3.7 (0.9-14.6), 4.1 (1.0-17.2), and 6.4 (1.4-30.0) for those in quartiles 3, 2, and 1 compared to quartile 4.	CC				(-)	
Cancer: cervical	Batieha AM	Serum micronutrients and the subsequent risk of cervical cancer in a population-based nested case-control study. Batieha AM, Armenian HK, Norkus EP, Morris JS, Spate VE, Comstock GW. Cancer Epidemiol Biomarkers Prev.	1993	A nested case-control study was conducted in Washington County, MD, to determine whether low serum micronutrients are related to the subsequent risk of cervical cancer. Among the 15,161 women who donated blood for future cancer research during a serum collection campaign in 1974, 18 developed invasive cervical cancer and 32 developed carcinoma in situ during the period January 1975 through May 1990. For each of these 50 cases, two matched controls were selected from the same cohort. The frozen sera of the cases and their matched controls were analyzed for a number of nutrients. The mean serum levels of total carotenoids, alpha-carotene, beta-carotene, cryptoxanthin, and lycopene were lower among cases than they were among	CC nested				N	

		1993 Jul-Aug;2(4):335-9.		controls. When examined by tertiles, the risk of cervical cancer was significantly higher among women in the lower tertiles of total carotenoids (odds ratio 2.7; 95% confidence limit, 1.1-6.4), alpha-carotene (odds ratio, 3.1; 95% confidence limit, 1.3-7.6), and beta-carotene (odds ratio, 3.1; 95% confidence limit, 1.2-8.1) as compared to women in the upper tertiles and the trends were statistically significant. Cryptoxanthin was significantly associated with a lower risk of cervical cancer when examined as a continuous variable. Retinol, lutein, alpha- and gamma-tocopherol, and selenium were not related to cervical cancer risk. Smoking was also strongly associated with cervical cancer. These findings are suggestive of a protective role for total carotenoids, alpha-carotene and beta-carotene in cervical carcinogenesis and possibly for cryptoxanthin and lycopene as well.						
Cancer: cervical	Potischman N	The relations between cervical cancer and serological markers of nutritional status. Potischman N, Hoover RN, Brinton LA, Swanson CA, Herrero R, Tenorio F, de Britton RC, Gaitan E, Reeves WC. Nutr Cancer. 1994;21(3):193-201.	1994	We evaluated whether differences in serological nutrient indicators between cases and controls were likely to be due to different usual levels for cases or to altered metabolism due to disease. Blood samples obtained as part of a case-control study of invasive cervical cancer conducted in Latin America were evaluated for case-control differences and for trends with stage of disease. Serum alpha- and beta-carotene, cryptoxanthin, and alpha- and gamma-tocopherol showed no trend with extent of disease, although Stage IV cases had lower alpha- and beta-carotene values than did other cases. A slight trend of decreasing values with stage was observed for serum retinol, lycopene, and lutein. For cholesterol and triglyceride concentrations, an inverse trend was observed with stage of disease, which suggested a clinical effect of the disease on blood lipids. Adjustment for smoking, alcohol intake, or oral contraceptive use did not alter observed relations, nor was there evidence that the altered blood nutrient levels differed by histological type. These data suggest that serum values for some carotenoids from Stage I, II, and III cervical cancer are suitable for etiological studies, but spurious results may be obtained if late-stage cases are included. Evidence of trends with severity of disease for cholesterol and triglycerides, and	CC				N?	

				possibly for retinol, lycopene, and lutein, suggest that special attention be given to disease effects of these nutrients in studies of cervical cancer.						
Cancer: cervical	Palan PR	<p>Plasma levels of beta-carotene, lycopene, canthaxanthin, retinol, and alpha- and tau-tocopherol in cervical intraepithelial neoplasia and cancer.</p> <p>Palan PR, Mikhail MS, Goldberg GL, Basu J, Runowicz CD, Romney SL.</p> <p>Clin Cancer Res. 1996 Jan;2(1):181-5.</p>	1996	<p>Epidemiological studies continue to identify an association of dietary antioxidant micronutrients in cancer prevention.</p> <p>A number of case-control and cohort studies have demonstrated a relationship between high intake of foods rich in carotenoids, tocopherols, and vitamin C with a reduced risk of certain human malignancies. The purpose of this study was to investigate the comparative plasma levels of a profile of known dietary antioxidants, namely, beta-carotene, lycopene, canthaxanthin, retinol, alpha-tocopherol, and tau-tocopherol. The target population was women with a histopathological diagnosis of cervical intraepithelial neoplasia (CIN) or cervical cancer and a control group. All women resided in the same catchment area (Bronx Borough, New York City) and were of similar inner-city socioeconomic backgrounds representing a fairly homogenous population group. A cross-sectional sample of 235 women was recruited with informed consent. Plasma nutrient levels were measured by reverse-phase high pressure liquid chromatography under study codes. The mean plasma levels of carotenoids (beta-carotene, lycopene, and canthaxanthin), as well as alpha-tocopherol, were significantly lower in women with CIN and cervical cancer. In contrast, the mean plasma level of tau-tocopherol was higher among patients with CIN, while the mean plasma level of retinol was comparable among the groups. There were significant linear trends for all three carotenoids and quadratic trends for alpha- and tau-tocopherol with the degree of cervical histopathology. Plasma beta-carotene concentrations in cigarette smokers were significantly lower regardless of cervical pathology, whereas plasma lycopene and canthaxanthin levels were significantly lower in smokers with CIN. The findings of a decrease in all plasma antioxidant nutrient levels except tau-tocopherol in women with CIN and cancer suggest a potential role for antioxidant deficiency</p>	CS				(-)	

				in the pathogenesis of CIN and carcinoma of the cervix, which requires further investigation.						
Cancer: cervical	Giuliano AR	<p>Antioxidant nutrients: associations with persistent human papillomavirus infection.</p> <p>Giuliano AR, Papenfuss M, Nour M, Canfield LM, Schneider A, Hatch K.</p> <p>Cancer Epidemiol Biomarkers Prev. 1997 Nov;6(11):917-23.</p>	1997	<p>Research from the past several years has definitively shown intermediate and high risk-type human papillomavirus (HPV) infection to play a significant role in cervical carcinogenesis. Persistent compared with intermittent infection appears to confer an elevated risk, and cofactors may be necessary to allow the virus to progress to cervical cancer. We explored the association between circulating concentrations of the antioxidant nutrients (alpha- and beta-carotene, lutein, lycopene, beta-cryptoxanthin, alpha-tocopherol, gamma-tocopherol, and ascorbate) and persistent HPV infection among 123 low-income Hispanic women who were all nonsmokers and were not currently using vitamin and mineral supplements. In addition, the association between these nutrients and grade of cervical pathology, independent of HPV status, was assessed. Intermediate and high risk-type HPV infection was assessed by the Digene Hybrid Capture System at two time points, 3 months apart. At the second interview, cytology, colposcopy, and a fasting blood draw were conducted. Mean concentrations of serum and plasma antioxidant nutrients were calculated within categories of HPV status (two times HPV negative, one time HPV positive, and two times HPV positive) and colposcopy. Adjusted mean concentrations of serum beta-carotene, beta-cryptoxanthin, lutein, and alpha- and gamma-tocopherol were on average 24% (P < 0.05) lower among women two times HPV positive compared with either two times HPV negative or one time HPV positive. Independent of HPV status, alpha-tocopherol was significantly inversely associated with grade of cervical dysplasia (normal, 21.57 microM; cervical intraepithelial neoplasia III, 17.27 microM). The results obtained in this study need to be confirmed in larger cohort studies with a longer follow-up period.</p>	CS				N	
Cancer: cervical	Goodman MT	The association of plasma micronutrients with the risk of cervical	1998	Limited data from hematological studies suggest that certain nutrients, including carotenoids, tocopherols, and vitamin C, may protect against malignant change in cervical tissue. Recognizing	CC				N	

		<p>dysplasia in Hawaii.</p> <p>Goodman MT, Kiviat N, McDuffie K, Hankin JH, Hernandez B, Wilkens LR, Franke A, Kuypers J, Kolonel LN, Nakamura J, Ing G, Branch B, Bertram CC, Kamemoto L, Sharma S, Killeen J.</p> <p>Cancer Epidemiol Biomarkers Prev. 1998 Jun;7(6):537-44.</p>		<p>that human papillomavirus (HPV) infection induces most neoplastic transformation of cervical tissue, the authors conducted a case-control study to examine the association of plasma micronutrient concentrations with the risk of cervical dysplasia after careful adjustment for HPV infection, using a sensitive and reliable HPV detection method. The sample included 147 multiethnic women, between 18 and 65 years of age, with biopsy-confirmed squamous intraepithelial lesions (SILs) of the cervix and 191 clinic controls identified between 1992 and 1996. Cases were identified through cytology and pathology logs in three clinics on Oahu, Hawaii. Controls were selected randomly from admission logs of the participating clinics. In-person interviews were conducted in the subjects' homes, and a fasting blood sample was drawn to measure plasma levels of lutein, lycopene, cryptoxanthin, total carotene, retinol, tocopherol, ascorbic acid, and cholesterol. The presence and type of HPV was determined in exfoliated cell samples using PCR dot blot hybridization. Mean plasma lycopene, total cryptoxanthin, and alpha-cryptoxanthin levels were lower among cases than controls. We found an inverse dose-response of alpha-cryptoxanthin, total tocopherol, and alpha-tocopherol to the odds ratios for cervical SIL after adjustment for HPV and other confounders. The odds ratio among women in the highest compared with the lowest quartile was 0.3 (95% confidence interval, 0.1-0.7) for alpha-cryptoxanthin and 0.3 (95% confidence interval, 0.1-0.8) for alpha-tocopherol. Negative trends in the odds ratios were suggested for other carotenoids and vitamin C, but these were weak, and confidence intervals were wide. Our results support existing evidence that high plasma levels of antioxidants may reduce the risk of cervical SILs independent of HPV infection. These findings are significant because diet is potentially modifiable, and nutrition education and dietary intervention might be targeted at specific high-risk groups.</p>						
Cancer: cervical	Peng YM	Concentrations of carotenoids, tocopherols, and retinol in paired plasma and	1998	Paired blood (collected after an overnight fast) and cervical tissue (cancerous, precancerous, and noncancerous) samples were obtained from 87 patients (age, 21-86 years) who had a hysterectomy or biopsy due to cervical cancer,	CC serum + tissue				N	

		<p>cervical tissue of patients with cervical cancer, precancer, and noncancerous diseases.</p> <p>Peng YM, Peng YS, Childers JM, Hatch KD, Roe DJ, Lin Y, Lin P.</p> <p>Cancer Epidemiol Biomarkers Prev. 1998 Apr;7(4):347-50.</p>		<p>precancer (cervical intraepithelial neoplasia I, II, and III), or noncancerous diseases. The samples were analyzed using high-performance liquid chromatography for 10 micronutrients (lutein, zeaxanthin, beta-cryptoxanthin, lycopene, alpha-carotene, beta-carotene, cis-beta-carotene, alpha-tocopherol, gamma-tocopherol, and retinol). The results indicated that: (a) among the three patient groups, the mean plasma concentrations of all micronutrients except gamma-tocopherol were lowest in the cancer patients; however, the mean tissue concentrations of the two tocopherols and certain carotenoids were highest in the cancerous tissue; and (b) among the 10 micronutrients, only the concentrations of beta-carotene and cis-beta-carotene were lower in both the plasma and tissue of cancer and precancer patients than in those of noncancer controls. These results suggest that: (a) not all of the micronutrient concentrations in plasma reflect the micronutrient concentrations in cervical tissue; thus, in some cases, it may be necessary to measure the tissue micronutrient concentrations to define the role of the micronutrients in cervical carcinogenesis; and (b) maintaining an adequate plasma and tissue concentration of beta-carotene may be necessary for the prevention of cervical cancer and precancer.</p>						
Cancer: cervical	Nagata C	<p>Serum carotenoids and vitamins and risk of cervical dysplasia from a case-control study in Japan.</p> <p>Nagata C, Shimizu H, Yoshikawa H, Noda K, Nozawa S, Yajima A, Sekiya S, Sugimori H, Hirai Y, Kanazawa K, Sugase M, Kawana T.</p> <p>Br J Cancer.</p>	1999	<p>The relationships between risk of cervical dysplasia and dietary and serum carotenoids and vitamins were investigated in a case-control study. Cases were 156 women who attended Papanicolaou test screening in nine institutes affiliated with Japan Study Group of Human Papillomavirus (HPV) and Cervical Cancer and had cervical dysplasia newly histologically confirmed. Age-matched controls were selected from women with normal cervical cytology attending the same clinic. Blood sample and cervical exfoliated cells were obtained for measuring serum retinol, alpha-carotene, beta-carotene, zeaxanthin/lutein, cryptoxanthin, lycopene and alpha-tocopherol and for HPV detection. Higher serum level of alpha-carotene was significantly associated with decreased risk of cervical dysplasia after controlling for HPV infection and smoking status</p>	CC				(-)	

		1999 Dec;81(7):1234-7.		(odds ratio (OR) = 0.16, 95% confidence interval (CI) 0.04-0.62 for the highest as compared with the lowest tertile). Decreased risk for the highest tertile of serum lycopene (OR = 0.28) was marginally significant. Decreased risks observed for the highest tertiles of beta-carotene (OR = 0.65) and zeaxanthin/lutein (OR = 0.53), were not statistically significant.						
Cancer: cervical	Schiff MA	Serum carotenoids and risk of cervical intraepithelial neoplasia in Southwestern American Indian women. Schiff MA, Patterson RE, Baumgartner RN, Masuk M, van Asselt-King L, Wheeler CM, Becker TM. Cancer Epidemiol Biomarkers Prev. 2001 Nov;10(11):1219-22.	2001	The objective of this research was to evaluate the association between serum carotenoids and cervical intraepithelial neoplasia (CIN) among Southwestern American Indian women. Cases were American Indian women with biopsy-proven CIN II/III cervical lesions (n = 81) diagnosed between November 1994 and October 1997. Controls were American Indian women from the same clinics with normal cervical epithelium (n = 160). All of the subjects underwent interviews and laboratory evaluations. Interviews evaluated demographic information, sexual history, and cigarette smoking. Serum concentrations of alpha-carotene, beta-carotene, beta-cryptoxanthin, lycopene, and lutein/zeaxanthin were measured by high performance liquid chromatography. Cervical humanpapillomavirus infection was detected using a PCR-based test. Increasing levels of alpha-carotene, beta-cryptoxanthin, and lutein/zeaxanthin were associated with decreasing risk of CIN II/III. In addition, the highest tertiles of beta-cryptoxanthin (odds ratio = 0.39, 95% confidence interval = 0.17-0.91) and lutein/zeaxanthin (odds ratio = 0.40, 95% confidence interval = 0.17-0.95) were associated with the lowest risk of CIN. In conclusion, specially targeted intervention efforts to increase consumption of fruits and vegetables may protect Southwestern American Indian women from developing CIN.	CC				NR/N	
Cancer: cervical	Sedjo RL	Vitamin A, carotenoids, and risk of persistent oncogenic human papillomavirus infection. Sedjo RL, Roe DJ,	2002	Oncogenic human papillomavirus (HPV) infection is the main etiologic factor for cervical neoplasia, although infection alone is insufficient to produce disease. Cofactors such as nutritional factors may be necessary for viral progression to neoplasia. Results from previous studies have suggested that higher dietary consumption and circulating levels of certain micronutrients may be protective	PC				(-)	

		<p>Abrahamsen M, Harris RB, Craft N, Baldwin S, Giuliano AR.</p> <p>Cancer Epidemiol Biomarkers Prev. 2002 Sep;11(9):876-84.</p>		<p>against cervical neoplasia. This study evaluated the role of vitamin A and carotenoids on HPV persistence comparing women with intermittent and persistent infections. As determined by the Hybrid Capture II system, oncogenic HPV infections were assessed at baseline and at approximately 3 and 9 months postbaseline. Multivariate logistic regression analysis was used to determine the risk of persistent HPV infection associated with each tertile of dietary and circulating micronutrients. Higher levels of vegetable consumption were associated with a 54% decrease risk of HPV persistence (adjusted odds ratio, 0.46; 95% confidence interval, 0.21-0.97). Also, a 56% reduction in HPV persistence risk was observed in women with the highest plasma cis-lycopene concentrations compared with women with the lowest plasma cis-lycopene concentrations (adjusted odds ratio, 0.44; 95% confidence interval, 0.19-1.01). These data suggest that vegetable consumption and circulating cis-lycopene may be protective against HPV persistence.</p>						
Cancer: cervical	Goodman MT	<p>Hawaii cohort study of serum micronutrient concentrations and clearance of incident oncogenic human papillomavirus infection of the cervix.</p> <p>Goodman MT, Shvetsov YB, McDuffie K, Wilkens LR, Zhu X, Franke AA, Bertram CC, Kessel B, Bernice M, Sunoo C, Ning L, Easa D, Killeen J, Kamemoto L, Hernandez BY.</p> <p>Cancer Res. 2007 Jun 15;67(12):5987-</p>	2007	<p>The degree to which the resolution of human papillomavirus (HPV) infection parallels exposure to other factors, particularly those related to nutritional status, is a relatively unexplored area of research. We established a cohort of women for long-term follow-up to examine the association of serum retinol, carotenoid, and tocopherol concentrations with the clearance of incident cervical HPV infection. Interviews and biological specimens were obtained at baseline and at 4-month intervals. At each visit, a cervical cell specimen for HPV DNA analysis and cytology and a fasting blood sample to measure micronutrient levels were collected. A Cox proportional hazards model was used to study the relationship between clearance of 189 incident (type-specific) oncogenic HPV infections and the levels of 20 serum micronutrients among 122 women. Higher circulating levels of trans-zeaxanthin, total trans-lutein/zeaxanthin, cryptoxanthin (total and beta), total trans-lycopene and cis-lycopene, carotene (alpha, beta, and total), and total carotenoids were associated with a significant decrease in the clearance time of type-specific HPV infection,</p>	PC				(-) ↓ clearance time of HPV in early infection	

		96. Epub 2007 Jun 6.		particularly during the early stages of infection (<or=120 days). HPV clearance time was also significantly shorter among women with the highest compared with the lowest serum levels of alpha-tocopherol and total-tocopherol, but significant trends in these associations were limited to infections lasting <or=120 days. Clearance of persistent HPV infection (lasting >120 days) was not significantly associated with circulating levels of carotenoids or tocopherols. Results from this investigation support an association of micronutrients with the rapid clearance of incident oncogenic HPV infection of the uterine cervix.						
Cancer: cervical	Cho H	Relationship of serum antioxidant micronutrients and sociodemographic factors to cervical neoplasia: a case-control study. Cho H, Kim MK, Lee JK, Son SK, Lee KB, Lee JM, Lee JP, Hur SY, Kim JH. Clin Chem Lab Med. 2009;47(8):1005-12	2009	BACKGROUND: Although there have been some epidemiological studies on the effects of diet and nutritional status on cervical carcinogenesis, evidence for a protective effect of antioxidant micronutrients against cervical neoplasia is insufficient. The relationship between serum antioxidant micronutrients and sociodemographic factors and the risk of cervical neoplasia was investigated in this multi-center, case-control study. METHODS: The study population included women with histopathological diagnosis of cervical intraepithelial neoplasia (CIN) 1 (n=147), CIN 2/3 (n=177), cervical cancer (n=160), and a control group (n=378). Epidemiological data were collected and the serum concentrations of beta-carotene, lycopene, zeaxanthin plus lutein, retinol, alpha-tocopherol, and gamma-tocopherol were measured using reverse-phase, gradient high-pressure liquid chromatography. RESULTS: Cervical cancer was found to be associated with older age, increased body mass index, and lower socioeconomic status as measured by education level and income. The mean serum concentrations of beta-carotene, lycopene, zeaxanthin plus lutein, retinol, alpha-tocopherol, and gamma-tocopherol of cervical cancer patients were significantly lower than those of control subjects. Odds ratio adjusted for age, smoking status, alcohol consumption, and human papillomavirus infection status revealed a significant gradient of decreasing risk of CIN 1, CIN 2/3, and cervical cancer with increasing serum concentrations of most antioxidant micronutrients.	CC				(-)	

				CONCLUSIONS: The results of this study show an inverse association between serum antioxidant micronutrient concentrations and the risk of cervical neoplasia. These results suggest that antioxidant micronutrients play a role in the prevention of cervical carcinogenesis.						
Cancer: cervical	Tong SY	<p>Functional polymorphism in manganese superoxide dismutase and antioxidant status: their interactions on the risk of cervical intraepithelial neoplasia and cervical cancer.</p> <p>Tong SY, Lee JM, Song ES, Lee KB, Kim MK, Lee JK, Son SK, Lee JP, Kim JH, Kwon YI.</p> <p>Gynecol Oncol. 2009 Nov;115(2):272-6. Epub 2009 Aug 25</p>	2009	<p>OBJECTIVE: Manganese superoxide dismutase (MnSOD), the primary antioxidant enzyme in mitochondria, plays a key role in protecting cells from oxidative stress. Furthermore, the MnSOD rs4880 polymorphism is associated with enzyme activity. The authors evaluated the interaction between MnSOD genotypes and cervical carcinogenesis risk and the modulating effects of serum antioxidant nutrient status (beta-carotene, lycopene, zeaxanthin/lutein, retinol, alpha-tocopherol and gamma-tocopherol) METHODS: Cases and controls for this study were recruited between June 2006 and July 2007 (263 controls, 84 cervical intraepithelial neoplasia (CIN), 94 CIN 2/3, and 99 cases of cervical cancer). The MnSOD polymorphism at rs4880T/C was examined using SNaPshot assays. Serum antioxidant vitamin concentrations were measured by reverse-phase gradient high-pressure liquid chromatography. Odds ratios (OR) and 95% confidence intervals (95%CI) were estimated after adjusting for age, menopause, parity, oral contraceptive use, smoking and alcohol consumption RESULTS: No association was found between the MnSOD rs4880 polymorphism and cervical cancer. However, genotypes significantly modified the risk of cervical cancer in association with the serum statuses of micronutrients (P(interaction)<0.05 for beta-carotene, lycopene, zeaxanthin/lutein, alpha-tocopherol, and gamma-tocopherol). Decreased CIN1 risk in association with the MnSOD rs4880 variant genotype was also observed particularly for subjects with higher beta-carotene and gamma-tocopherol levels. Similar results were observed for lycopene and alpha-tocopherol in relation to the risk of CIN2/3. CONCLUSION: Our findings suggest that a higher antioxidant micronutrients status may decrease the risk of CIN and cervical cancer and modify the effect of the MnSOD polymorphism on disease risk.</p>	CC				(-)	MnSOD polymorphism and Lyco interaction

Cancer: cervical	Tomita LY	<p>Diet and serum micronutrients in relation to cervical neoplasia and cancer among low-income Brazilian women.</p> <p>Tomita LY, Longatto Filho A, Costa MC, Andreoli MA, Villa LL, Franco EL, Cardoso MA;</p> <p>Brazilian Investigation into Nutrition and Cervical Cancer Prevention (BRINCA) Study Team.</p> <p>Int J Cancer. 2010 Feb 1;126(3):703-14</p>	2010	<p>Cervical cancer is a leading cancer among women in developing countries. Infection with oncogenic human papillomavirus (HPV) types has been recognized as a necessary cause of this disease. Serum carotenoids and tocopherols have also been associated with risk for cervical neoplasia, but results from previous studies were not consistent. We evaluated the association of serum total carotene and tocopherols, and dietary intakes with the risk of newly diagnosed, histologically confirmed cervical intraepithelial neoplasia (CIN) grades 1, 2, 3 and invasive cancer in a hospital-based case-control study in São Paulo, Brazil. The investigation included 453 controls and 4 groups of cases (CIN1, n = 140; CIN2, n = 126; CIN3, n = 231; invasive cancer, n = 108) recruited from two major public clinics between 2003 and 2005. Increasing concentrations of serum lycopene were negatively associated with CIN1, CIN3 and cancer, with odds ratios (OR) (95% CI) for the highest compared to the lowest tertile of 0.53 (0.27-1.00, p for trend = 0.05), 0.48 (0.22-1.04, p for trend = 0.05) and 0.18 (0.06-0.52, p for trend = 0.002), respectively, after adjusting for confounding variables and HPV status. Increasing concentrations of serum alpha- and gamma-tocopherols, and higher dietary intakes of dark green and deep yellow vegetables/fruit were associated with nearly 50% decreased risk of CIN3. These results support the evidence that a healthy and balanced diet leading to provide high serum levels of antioxidants may reduce cervical neoplasia risk in low-income women.</p>	CC				(-)	
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