



REsearch UPDATES

FOR THE LATEST IN WORLDWIDE INTEGRATED CANCER CARE

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STUDY OF THE MONTH 6

IN THIS ISSUE: To paraphrase Shakespeare, "To [eat] or not to [eat]...that is the question," can also be said to apply to supplements like fiber and multivitamins when talking about cancer prevention. It seems that not only is the food you eat important for cancer prevention, but the supplements that you take are important as well. For instance, Larsson and colleagues found that women who take multivitamins have an increased risk of breast cancer. Having said that, Chan and Giovannucci found that taking calcium supplements was at least modestly beneficial against colorectal cancer, and Dahm et al. found that dietary fiber can reduce the risk of colorectal cancer. Bidoli and colleagues found that lignin (fiber) can reduce the risk of endometrial cancer and—in our study of the month—Hwang and others found that women with HPV who took multivitamins had a reduced risk of developing cervical cancer.

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BREAST CANCER

Larsson, SC, A. Akesson, L. Bergkvist and A. Wolk.

Multivitamin use and Breast Cancer Incidence in a Prospective Cohort of Swedish Women.

Am J Clin Nutr. 2010 01 May; 915: 1268-1272.

BACKGROUND: Many women use multivitamins in the belief that these supplements will prevent chronic diseases such as cancer and cardiovascular disease. However, whether the use of multivitamins affects the risk of breast cancer is unclear. **OBJECTIVE:** We prospectively examined the association between multivitamin use and the incidence of invasive breast cancer in the Swedish Mammography Cohort. **DESIGN:** In 1997, 35,329 cancer-free women completed a self-administered questionnaire that solicited information on multivitamin use as well as other breast cancer risk factors. Relative risks (RRs) and 95% CIs were calculated by using Cox proportional hazard models and adjusted for breast cancer risk factors.

RESULTS: During a mean follow-up of 9.5 y, 974 women were diagnosed with incident breast cancer. Multivitamin use was associated with a statistically significant increased risk of breast cancer. The multivariable RR of women who reported the use of multivitamins was 1.19 (95% CI: 1.04, 1.37). The association did not differ significantly by hormone receptor status of the breast tumor.

CONCLUSIONS: These results suggest that multivitamin use is associated with an increased risk of breast cancer. This observed association is of concern and merits further investigation.



NUTRITION

Nimptsch, K, S. Rohrmann, R. Kaaks and J. Linseisen.

Dietary Vitamin K Intake in Relation to Cancer Incidence and Mortality: Results from the Heidelberg Cohort of the European Prospective Investigation into Cancer and Nutrition (EPIC-Heidelberg).

Am J Clin Nutr. 2010 01 May; 915: 1348-1358.

BACKGROUND: Anticarcinogenic activities of vitamin K have been observed in animal and cell studies. **OBJECTIVE:** On the basis of the growth inhibitory effects of vitamin K as observed in a variety of cancer cell lines, we hypothesized that dietary intake of phyloquinone (vitamin K1) and menaquinones (vitamin K2) may be associated with overall cancer incidence and mortality. **DESIGN:** In the prospective EPIC-Heidelberg (European Prospective Investigation into Cancer and Nutrition-Heidelberg) cohort study, 24,340 participants aged 35-64 y and free of cancer at enrollment (1994-1998) were actively followed up for cancer incidence and mortality through 2008. Dietary vitamin K intake was estimated from food-frequency questionnaires completed at baseline by using HPLC-based food-composition data. Multivariate-adjusted hazard ratios (HRs) and 95% CIs were estimated by using Cox proportional hazards models.

RESULTS: During a median follow-up time of >10 y, 1755 incident cancer cases occurred, of which 458 were fatal. Dietary intake of menaquinones was nonsignificantly inversely associated with overall cancer incidence (HR for the highest compared with the lowest quartile: 0.86; 95% CI: 0.73, 1.01; P for trend = 0.08), and the association was stronger for cancer mortality (HR: 0.72; 95% CI: 0.53, 0.98; P for trend = 0.03). Cancer risk reduction with increasing intake of menaquinones was more pronounced in men than in women, mainly driven by significant inverse associations with prostate (P for trend = 0.03) and lung (P for trend = 0.002) cancer. We found no association with phyloquinone intake.

CONCLUSION: These findings suggest that dietary intake of menaquinones, which is highly determined by the consumption of cheese, is associated with a reduced risk of incident and fatal cancer.

COLORECTAL CANCER

Chan, AT and E. L. Giovannucci.

Primary Prevention of Colorectal Cancer.

Gastroenterology. 2010 Jun; 1386: 2029-2043.e10.

Colorectal cancer has been strongly associated with a Western lifestyle. In the past several decades, much has been learned about the dietary, lifestyle, and medication risk factors for this malignancy. Although there is controversy about the role of specific nutritional factors, consideration of dietary pattern as a whole appears useful for formulating recommendations. For example, several studies have shown that high intake of red and processed meats, highly refined grains and starches, and sugars is related to increased risk of colorectal cancer. Replacing these factors with poultry, fish, and plant sources as the primary source of protein; unsaturated fats as the primary source of fat; and unrefined grains, legumes and fruits as the primary source of carbohydrates is likely to lower risk of colorectal cancer. Although a role for supplements, including vitamin D, folate, and vitamin B6, remains uncertain, calcium supplementation is likely to be at least modestly beneficial. With respect to lifestyle, compelling evidence indicates that avoidance of smoking and heavy alcohol use, prevention of weight gain, and maintenance of a reasonable level of physical activity are associated with markedly lower risks of colorectal cancer. Medications such as aspirin and nonsteroidal anti-inflammatory drugs and postmenopausal hormones for women are associated with substantial reductions in colorectal cancer risk, though their utility is affected by associated risks.

CONCLUSION: Taken together, modifications in diet and lifestyle should substantially reduce the risk of colorectal cancer and could complement screening in reducing colorectal cancer incidence.



Dahm, CC, R. H. Keogh, E. A. Spencer, et al.

Dietary Fiber and Colorectal Cancer Risk: A Nested Case-Control Study using Food Diaries.

J Natl Cancer Inst. 2010 May 5; 1029: 614-626.

BACKGROUND: Results of epidemiological studies of dietary fiber and colorectal cancer risk have not been consistent, possibly because of attenuation of associations due to measurement error in dietary exposure ascertainment. **METHODS:** To examine the association between dietary fiber intake and colorectal cancer risk, we conducted a prospective case-control study nested within seven UK cohort studies, which included 579 case patients who developed incident colorectal cancer and 1996 matched control subjects. We used standardized dietary data obtained from 4- to 7-day food diaries that were completed by all participants to calculate the odds ratios for colorectal, colon, and rectal cancers with the use of conditional logistic regression models that adjusted for relevant covariates. We also calculated odds ratios for colorectal cancer by using dietary data obtained from food-frequency questionnaires that were completed by most participants. All statistical tests were two-sided.

RESULTS: Intakes of absolute fiber and of fiber intake density, ascertained by food diaries, were statistically significantly inversely associated with the risks of colorectal and colon cancers in both age-adjusted models and multivariable models that adjusted for age; anthropomorphic and socioeconomic factors; and dietary intakes of folate, alcohol, and energy. For example, the multivariable-adjusted odds ratio of colorectal cancer for highest vs the lowest quintile of fiber intake density was 0.66 (95% confidence interval = 0.45 to 0.96). However, no statistically significant association was observed when the same analysis was conducted using dietary data obtained by food-frequency questionnaire (multivariable odds ratio = 0.88, 95% confidence interval = 0.57 to 1.36).

CONCLUSIONS: Intake of dietary fiber is inversely associated with colorectal cancer risk. Methodological differences (ie, study design, dietary assessment instruments, definition of fiber) may account for the lack of convincing evidence for the inverse association between fiber intake and colorectal cancer risk in some previous studies.



HEPATOCELLULAR CARCINOMA

Hassan, MM, S. A. Curley, D. Li, et al.

Association of Diabetes Duration and Diabetes Treatment with the Risk of Hepatocellular Carcinoma.

Cancer. 2010 15 Apr; 1168: 1938-1946.

BACKGROUND: Despite the observed association between diabetes mellitus and hepatocellular carcinoma (HCC), little is known about the effect of diabetes duration before HCC diagnosis and whether some diabetes medications reduced the risk of HCC development. This objective of the current study was to determine the association between HCC risk and diabetes duration and type of diabetes treatment. **METHODS:** A total of 420 patients with HCC and 1104 healthy controls were enrolled in an ongoing hospital-based case-control study. Multivariate logistic regression models were used to adjust for HCC risk factors.

RESULTS: The prevalence of diabetes mellitus was 33.3% in patients with HCC and 10.4% in the control group, yielding an adjusted odds ratio (AOR) of 4.2 (95% confidence interval [95% CI], 3.0-5.9). In 87% of cases, diabetes was present before the diagnosis of HCC, yielding an AOR of 4.4 (95% CI, 3.0-6.3). Compared with patients with a diabetes duration of 2 to 5 years, the estimated AORs for those with a diabetes duration of 6 to 10 years and those with a diabetes duration >10 years were 1.8 (95% CI, 0.8-4.1) and 2.2 (95% CI, 1.2-4.8), respectively. With respect to diabetes treatment, the AORs were 0.3 (95% CI, 0.2-0.6), 0.3 (95% CI, 0.1-0.7), 7.1 (95% CI, 2.9-16.9), 1.9 (95% CI, 0.8-4.6), and 7.8 (95% CI, 1.5-40.0) for those treated with biguanides, thiazolidinediones, sulfonylureas, insulin, and dietary control, respectively.



CONCLUSIONS: Diabetes appears to increase the risk of HCC, and such risk is correlated with a long duration of diabetes. Relying on dietary control and treatment with sulfonylureas or insulin were found to confer the highest magnitude of HCC risk, whereas treatment with biguanides or thiazolidinediones was associated with a 70% HCC risk reduction among diabetics.

ENDOMETRIAL CANCER

Bidoli, E, C. Pelucchi, A. Zucchetto, et al.

Fiber Intake and Endometrial Cancer Risk.

Acta Oncol. 2010 494: 441-446.

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BACKGROUND: The epidemiological evidence on the relation between dietary fiber intake and endometrial cancer is contradictory. Consequently, a case-control study was carried out to further investigate the role of dietary fiber intake in the etiology of endometrial cancer.

MATERIAL AND METHODS: Cases were 454 women with incident, histologically confirmed, endometrial cancer admitted to major teaching and general hospitals. Controls were 908 women admitted for acute, non-neoplastic conditions to the same hospital network. Information on diet was elicited using a validated food frequency questionnaire.

RESULTS: Odds ratios (OR) and 95% confidence intervals (CI) for quintiles of various types of fiber were estimated after allowance for total energy intake and other potential confounding factors. Lignin intake was significantly inversely related to endometrial cancer (OR=0.6 for the highest versus the lowest quintile of intake; 95%CI: 0.4-0.9) with a slightly significant linear trend in risk (p-value=0.04).

DISCUSSION: Data suggest the potential importance of lignin in the prevention of endometrial cancer at Italian consumption levels.

InspireHealth's INTERPRETATION: High intake of Lignin, a dietary fiber abundant in flax seeds, was associated with a 40% decreased risk of endometrial cancer.

VITAMIN D

Rhodes, LE, A. R. Webb, H. I. Fraser, et al.

Recommended Summer Sunlight Exposure Levels can Produce Sufficient (> Or =20 Ng ml(-1)) but Not the Proposed Optimal (> Or =32 Ng ml(-1)) 25(OH)D Levels at UK Latitudes.

J Invest Dermatol. 2010 May; 1305: 1411-1418.

BACKGROUND: Recommendations on limitation of summer sunlight exposure to prevent skin cancer may conflict with requirements to protect bone health through adequate vitamin D levels, the principal source being UVB in summer sunlight. **METHODS:** We determined whether sufficient (> or =20 ng ml(-1)) and proposed optimal (> or =32 ng ml(-1)) 25(OH)D levels are attained by following UK guidance advising casual short exposures to UVB in summer sunlight, and performed the study under known conditions to enhance the specificity of future recommendations. During wintertime, when ambient UVB is negligible, 120 white Caucasians, aged 20-60 years, from Greater Manchester, UK (53.5 degrees N) received a simulated summer's sunlight exposures, specifically 1.3 standard erythemal dose, three times weekly for 6 weeks, while wearing T-shirt and shorts.

RESULTS: The baseline winter data predict that 5% (confidence interval (CI): 2.7-8.6) of Greater Manchester white Caucasians have deficient (<5 ng ml(-1)) 25(OH)D, 62.5% (CI: 55.2-69.4) have insufficient, and only



2.9% (CI: 1.4-5.6) have proposed optimal levels. After the simulated summer exposures, 90 (CI: 84.9-93.7) and 26.2% (CI: 20.1-33.2) reached 20 and 32 ng ml⁻¹ 25(OH)D, respectively.

CONCLUSION: Assuming midday UVB levels, sufficient but suboptimal vitamin D status is attained after a summer's short (13 minutes) sunlight exposures to 35% skin surface area; these findings will assist future public health guidance on vitamin D acquisition.

MALIGNANT LYMPHOMA

Kanda, J, K. Matsuo, T. Suzuki, et al.

Association between Obesity and the Risk of Malignant Lymphoma in Japanese: A Case-Control Study.

International Journal of Cancer. 2010 15 May; 12610: 2416-2425.

BACKGROUND: Although marked differences in anthropometric characteristics and malignant lymphoma (ML) incidence suggest that the association between obesity and ML risk in Asian and non-Asian populations may differ, few studies have investigated this association in Asian populations. **METHODS:** Here, we conducted a sex- and age-matched case-control study in a Japanese population using 782 cases and 3,910 noncancer controls in the hospital-based Epidemiological Research Program at Aichi Cancer Center Hospital. Odds ratios (ORs) and 95% confidence intervals (CIs) for anthropometric characteristics were estimated using a conditional logistic regression model that incorporated smoking and alcohol intake.

RESULTS: Recent body weight and body mass index (BMI) showed marginally significant association with ML risk (ORs [95% CIs] per 5-unit increase in recent weight and BMI; 1.04 [0.99-1.09] and 1.11 [0.98-1.27], respectively). On the other hand, weight and BMI in early adulthood exhibited a strong association with ML risk (ORs [95% CIs] per 5-unit increase in early adulthood weight and BMI; 1.11 [1.05-1.18] and 1.33 [1.13-1.55], respectively). Further, in women, a BMI of 25.0-29.9 kg/m², defined as obesity in Asian populations, during early adulthood was significantly associated with ML risk compared to the normal range of 18.5-22.9 kg/m². By histological ML subtype, the point estimates of ORs for obesity relative to normal weight in early adulthood were over unity for non-Hodgkin lymphoma (NHL) as a whole and significant for diffuse large B-cell lymphoma (DLBCL).

CONCLUSION: In conclusion, our study in Japanese subjects suggested that early adulthood obesity is associated with the risk of NHL, particularly DLBCL.

PROSTATE CANCER

Lophatananon, A, J. Archer, D. Easton, et al.

Dietary Fat and Early-Onset Prostate Cancer Risk.

Br J Nutr. 2010 May; 1039: 1375-1380.

BACKGROUND: The UK incidence of prostate cancer has been increasing in men aged < 60 years. Migrant studies and global and secular variation in incidence suggest that modifiable factors, including a high-fat diet, may contribute to prostate cancer risk. **METHODS:** The aim of the present study was to investigate the role of dietary fat intake and its derivatives on early-onset prostate cancer risk. During 1999-2004, a population-based case-control study with 512 cases and 838 controls was conducted. Cases were diagnosed with prostate cancer when < or = 60 years. Controls were sourced from UK GP practice registers. A self-administered FFQ collected data on typical past diet. A nutritional database was used to calculate daily fat intake.

RESULTS: A positive, statistically significant risk estimate for the highest v. lowest quintile of intake of total



fat, SFA, MUFA and PUFA was observed when adjusted for confounding variables: OR 2.53 (95 % CI 1.72, 3.74), OR 2.49 (95 % CI 1.69, 3.66), OR 2.69 (95 % CI 1.82, 3.96) and OR 2.34 (95 % CI 1.59, 3.46), respectively, with all P for trend < 0.001.

CONCLUSIONS: In conclusion, there was a positive statistically significant association between prostate cancer risk and energy-adjusted intake of total fat and fat subtypes. These results potentially identify a modifiable risk factor for early-onset prostate cancer.

THYROID CANCER

Ward, MH, B. A. Kilfoy, P. J. Weyer, K. E. Anderson, A. R. Folsom and J. R. Cerhan.

Nitrate Intake and the Risk of Thyroid Cancer and Thyroid Disease.

Epidemiology. 2010 May; 213: 389-395.

BACKGROUND: Nitrate is a contaminant of drinking water in agricultural areas and is found at high levels in some vegetables. Nitrate competes with uptake of iodide by the thyroid, thus potentially affecting thyroid function. **METHODS:** We investigated the association of nitrate intake from public water supplies and diet with the risk of thyroid cancer and self-reported hypothyroidism and hyperthyroidism in a cohort of 21,977 older women in Iowa who were enrolled in 1986 and who had used the same water supply for >10 years. We estimated nitrate ingestion from drinking water using a public database of nitrate measurements (1955-1988). Dietary nitrate intake was estimated using a food frequency questionnaire and levels from the published literature. Cancer incidence was determined through 2004.

RESULTS: We found an increased risk of thyroid cancer with higher average nitrate levels in public water supplies and with longer consumption of water exceeding 5 mg/L nitrate-N (for [greater-than or equal to] 5 years at >5 mg/L, relative risk [RR] = 2.6 [95% confidence interval (CI) = 1.1-6.2]). We observed no association with prevalence of hypothyroidism or hyperthyroidism. Increasing intake of dietary nitrate was associated with an increased risk of thyroid cancer (highest vs. lowest quartile, RR = 2.9 [1.0-8.1]; P for trend = 0.046) and with the prevalence of hypothyroidism (odds ratio = 1.2 [95% CI = 1.1-1.4]), but not hyperthyroidism.

CONCLUSIONS: Nitrate may play a role in the etiology of thyroid cancer and warrants further study.

STUDY OF THE MONTH

Hwang, JH, M. K. Kim and J. K. Lee.

Dietary Supplements Reduce the Risk of Cervical Intraepithelial Neoplasia.

International Journal of Gynecological Cancer. 2010 April; 203: 398-403.

OBJECTIVE: To examine the effects of dietary supplements on high-risk human papillomavirus (HPV) infection and cervical carcinogenesis. **METHODS:** A multi-institutional cross-sectional study was carried out to examine whether dietary supplements were associated with the risk of cervical intraepithelial neoplasia (CIN). We enrolled 1096 women aged 18 to 65 years to participate in an HPV cohort study from March 2006 up to present. For this analysis, we included 328 HPV-positive women (166 controls; 90 CIN I and 72 CIN II/III). The details of each participant's routine dietary intake during the prior year were collected. Specific dietary supplements were classified into 5 categories, namely, multivitamins, multinutrients, vitamin C, calcium, and miscellaneous.

RESULTS: A higher HPV viral load was associated with an increased risk of CIN II/III (odds ratio [OR], 3.32; 95% confidence interval [CI], 1.54-7.16; P for trend 0.002). Dietary supplement use including multivitamins (OR, 0.21; 95% CI, 0.09-0.48), vitamins A (OR, 0.19; 95% CI, 0.07-0.53), C (OR, 0.24; 95% CI, 0.10-0.56), E (OR, 0.20; 95% CI, 0.07-0.53), and calcium (OR, 0.21; 95% CI, 0.08-0.50) was significantly associated with a lower



risk of CIN II/III. The patients who took multivitamins and had a lower HPV viral load (<15.5 relative light units/positive control) had a significantly decreased frequency of CIN I (OR, 0.35; 95% CI, 0.14-0.87; interaction P = 0.925) and CIN II/III (OR, 0.11; 95% CI, 0.04-0.37; interaction P = 0.304).

CONCLUSIONS: The findings of this study suggest that dietary supplements may reduce the risk of CINs in women with high-risk HPV infection.

ELECTRONIC RESEARCH UPDATES - BONUS ABSTRACTS

BREAST CANCER



Soy Associated with Less Risk of Breast Cancer Recurrence and Death.

J Natl Med Assoc. 2010 April; 1024: 357.

BACKGROUND: The estrogen-like effect of isoflavones in soy foods may influence the risk of breast cancer recurrence and subsequent mortality. **METHODS:** These investigators prospectively followed 5042 women, aged 20 to 75 years with documented breast cancer who were recruited as part of the Shanghai Breast Cancer Survival Study. Medical charts and vital statistic registries were reviewed to verify clinical outcomes. Dietary intake was assessed using a validated food frequency questionnaire designed to measure soy food consumption.

RESULTS: Complete follow-up occurred for 88.2% of study patients. Multivariate analyses were performed to control for other known clinical prognosis factors (eg, age, tumor stage, type of treatment, menopausal status, tamoxifen use, and estrogen receptor [ER] status). A total of 534 recurrences or breast cancer-related deaths and 444 total deaths were documented during the study period. Women consuming increasing amounts of soy protein had an inversely reduced risk of mortality and breast cancer recurrence. Adjusted 4-year mortality rates were 10.3% and 7.4%, and the 4-year recurrence rates were 11.2% and 8.0%, respectively, for women in the lowest and highest quartiles of soy protein intake. Mortality and recurrence risk followed a linear dose-response pattern until soy protein intake reached 11 g per day. The reduced risk from soy food intake was similar among women with either ER-positive or ER-negative breast cancers and did not vary by menopausal status, tamoxifen use, or cancer stage.

CONCLUSION: Women whose soy food intake was in the highest quartile did not appear to receive any additional survival or recurrence benefit from tamoxifen use.

Cade, JE, E. F. Taylor, V. J. Burley and D. C. Greenwood.

Common Dietary Patterns and Risk of Breast Cancer: Analysis from the United Kingdom Women's Cohort Study.

Nutr Cancer. 2010 April; 623: 300-306.

BACKGROUND: The relationship between diet and breast cancer is uncertain. **METHODS:** We assessed the relationship of 4 common dietary patterns to the risk of breast cancer using the UK Women's Cohort Study (UKWCS). A total of 35,372 women aged between 35 to 69 yr were recruited from 1995 to 1998. The UKWCS was selected to have a wide range of dietary intakes; 28% were self-reported vegetarian. Diet was assessed at baseline by a 217-item food frequency questionnaire. Four dietary patterns were defined based on a hierarchy of consumption of fish and meat to reflect commonly consumed dietary patterns. Hazards ratios (HRs) were estimated using Cox regression adjusted for known confounders.

RESULTS: Subjects were followed up for a mean of 9 yr, and 330 premenopausal and 453 postmenopausal women developed invasive breast cancer. In postmenopausal women, there was a strong inverse association between the fish eating dietary pattern 0.60 (95% CI = 0.38-0.96) but not for a vegetarian pattern 0.85 (95% CI = 0.58-1.25) compared to red meat eaters. There were no statistically significant associations with dietary pattern and risk of premenopausal breast cancer.

CONCLUSION: A fish eating dietary pattern that excludes meat from the diet may confer some benefit with regard to risk of postmenopausal breast cancer.

Den Oudsten, BL, G. L. Van Heck, A. F. Van der Steeg, J. A. Roukema and J. De Vries.

Personality Predicts Perceived Availability of Social Support and Satisfaction with Social Support in Women with Early Stage Breast Cancer.

Supportive Care in Cancer. 2010 Apr; 184: 499-508.

GOALS OF WORK: This study examines the relationships between personality, on the one hand, and perceived availability of social support (PASS) and satisfaction with received social support (SRSS), on the other hand, in women with early stage breast cancer (BC). In addition, this study examined whether a stressful event (i.e., diagnosis) is associated with quality of life (QOL), when controlling for PASS and SRSS. **PATIENTS AND METHOD:** Women were assessed on PASS and SRSS (World Health Organization QOL assessment instrument-100) before diagnosis (time 1) and 1 (time 2), 3 (time 3), 6 (time 4), 12 (time 5), and 24 months (time 6) after surgical treatment. Personality (neuroticism extraversion openness five-factor inventory and state trait anxiety inventory-trait scale) and fatigue (fatigue assessment scale) were assessed at time 1.

MAIN RESULTS: Agreeableness and fatigue predicted PASS and SRSS at time 5 and time 6. Trait anxiety had a negative effect on SRSS ($ss = -0.22, p < .05$). In addition, having a job was negatively associated with SRSS (time 6, $ss = -0.28, p < .05$). Across time, women reported a decrease in PASS and SRSS. Path models, used to test whether PASS and/or SRSS functioned as mediators of the link between diagnosis and QOL, reached adequate fit.

CONCLUSIONS: Besides factors, like fatigue and having a job, personality factors substantially influence the way women with early stage BC perceive social support. Knowledge about these underlying mechanisms of social support is useful for the development of tailor-made interventions. Professionals should be aware of the importance of social support. They should check whether patients have sufficient significant others in their social environment and be sensitive to potential discrepancies patients might experience between availability and adequacy of social support.

Gao, CM, K. Tajima, J. H. Ding, et al.

Body Size, Physical Activity and Risk of Breast Cancer - a Case Control Study in Jiangsu Province of China.

Asian Pacific Journal of Cancer Prevention: Apjcp. 2009 105: 877-881.

BACKGROUND: To evaluate the relationship between body size, physical activity and risk of breast cancer, we conducted a case-control study with 669 cases and 682 population-based controls in Jiangsu Province of China. **METHODS:** A structured questionnaire was used to elicit detailed information. All subjects completed an in-person interview. The body mass index (BMI) was calculated based on weights and heights. Unconditional logistic regression analysis was performed to calculate odds ratios (ORs) and 95% confidence intervals (CIs) as measures of risk for breast cancer.

RESULTS: Current height, weight and weight at around age 20 years were significantly positively correlated with risk of breast cancer. Obese women (current BMI $> \text{or} = 25 \text{ kg/m}^2$) were at significantly increased risk for developing breast cancer (adjusted OR= 1.35, 95%CI: 1.01-1.81), but, between BMI at around age 20 years and risk of breast cancer showed an inverse association ($P \text{ for trend} = 0.001$). Women who had middle physical force work were at significantly lowered OR (0.62, 95%CI: 0.41-0.93) compared with women of

headwork. Using women who standing or ambulation per day less than one hour as the reference, women who standing or ambulation more than one hour had a decreased risk of breast cancer. Using women who slept less than 5 hours per day as the reference, the women who slept 5-8 hours were at significantly decreased risk of breast cancer. Women who had habit of recreational physical activity were at significantly decreased risk (adjusted OR= 0.68, 95%CI: 0.53-0.88), with an inverse association between the exercise times per week and risk of breast cancer (P for trend = 0.025).

CONCLUSION: These findings support that breast cancer risk is associated with body size, and that moderate occupational and recreational physical activity has protective effects on breast cancer.



Ratnasinghe, LD, R. V. Modali, M. B. Seddon and T. A. Lehman.

Physical Activity and Reduced Breast Cancer Risk: A Multinational Study.

Nutr Cancer. 2010 May; 624: 425-435.

BACKGROUND: We evaluated the association between physical activity and breast cancer risk among 1,463 breast cancer cases and 4,862 controls in a multinational study. **METHODS:** All subjects were asked how many times and for how long they exercised or engaged in strenuous physical labor per week. We used multivariate logistic regression to assess the association between physical activity and breast cancer risk.

RESULTS: For all subjects combined, the multivariate-adjusted odds ratio was 50% lower (95% confidence interval = 0.4-0.6) for women who reported physical activity once per week or more after adjusting for age, race, body mass index, and pack years of smoking compared to those who reported physical activity less than once per week. Women who reported physical activity 3 times/wk or more did not gain any additional reduced risk. The amount of time spent in physical activity per session was also significantly associated with reduced risk. All ethnic groups examined including Caucasian-Americans, African-Americans, Hispanic-Americans, Tunisian-Arabs, and Polish-Caucasians were at 35% or greater reduced risk for breast cancer if they were physically active for more than 30 minutes per week.

CONCLUSION: Our study shows that physical activity may reduce breast cancer risk regardless of race, weight category, or family history of breast cancer.

Shin, A, J. Kim, S. -Y Lim, et al.

Dietary Mushroom Intake and the Risk of Breast Cancer Based on Hormone Receptor Status.

Nutr Cancer. 2010 May; 624: 476-483.

BACKGROUND: Although many studies have documented the antitumor activities of mushrooms, the association between mushroom intake and breast cancer, defined by hormone receptor status, has received minimal empirical investigation. **METHODS:** This study evaluated the association between mushroom intake and the risk of breast cancer according to hormone receptor status among Korean women. Mushroom intake and breast cancer risk were examined among 358 breast cancer patients and 360 cancer-free controls. Intake of mushrooms was assessed using a quantitative food frequency questionnaire.

RESULTS: Greater mushroom intake was related to lower risk of breast cancers among premenopausal women (odds ratio [OR] = 0.35, 95% confidence interval [CI] = 0.13-0.91 for the highest vs. the lowest quartile intake). The association was stronger for premenopausal women with estrogen receptor (ER)+/progesterone receptor (PR) + tumors (OR = 0.30, 95% CI = 0.11-0.79 for the highest vs. the lowest quartile intake) than those with ER-/PR- tumors.

CONCLUSION: Our results suggest that high consumption of mushrooms might be related to lower risks for breast cancers among premenopausal women; this association may be more robust among women with hormone receptor positive tumors.

Yang, YJ, S. J. Nam, G. Kong and M. K. Kim.

A Case-Control Study on Seaweed Consumption and the Risk of Breast Cancer.

Br J Nutr. 2010 May; 1039: 1345-1353.



BACKGROUND: Gim (*Porphyra* sp.) and miyeok (*Undaria pinnatifida*) are the seaweeds most consumed by Koreans. **METHODS:** We investigated the association between the intake of gim and miyeok and the risk of breast cancer in a case-control study. Cases were 362 women aged 30-65 years old, who were histologically confirmed to have breast cancer. Controls visiting the same hospital were matched to cases according to their age (sd 2 years) and menopausal status. Food intake was estimated by the quantitative FFQ with 121 items, including gim and miyeok. Conditional logistic regression analysis was used to obtain the OR and corresponding 95 % CI. The average intake and consumption frequency of gim in cases were lower than in controls.

RESULTS: The daily intake of gim was inversely associated with the risk of breast cancer (5th v. 1st quintile, OR, 0.48; 95 % CI, 0.27, 0.86; P for trend, 0.026) after adjustment for potential confounders. After stratification analysis was performed according to menopausal status, premenopausal women (5th v. 1st quintile, OR, 0.44; 95 % CI, 0.24, 0.80; P for trend, 0.007) and postmenopausal women (5th v. 1st quintile, OR, 0.32; 95 % CI, 0.13, 0.80; P for trend, 0.06) showed similar inverse associations between gim intake and the risk of breast cancer after an adjustment for potential confounders except dietary factors. Miyeok consumption did not have any significant associations with breast cancer.

CONCLUSION: These results suggest that high intake of gim may decrease the risk of breast cancer.

Yu, H, J. -Y Hwang, J. Ro, J. Kim and N. Chang.

Vegetables, but Not Pickled Vegetables, are Negatively Associated with the Risk of Breast Cancer.

Nutr Cancer. 2010 May; 624: 443-453.

BACKGROUND: This study investigated the association between pickled vegetable consumption and the risk of breast cancer using a validated food frequency questionnaire. **METHODS:** A total of 358 patients with breast cancer who were matched to 360 healthy controls by age (using a 5-yr age distribution) were recruited from the National Cancer Center in South Korea.

RESULTS: After adjusting for nondietary risk factors, total vegetable intake was inversely associated with risk of breast cancer. However, unlike nonpickled vegetables, pickled vegetable intake and its proportion relative to total vegetables were positively associated with the risk of breast cancer, and this association was more profound and consistent when pickled vegetable intake was considered as a proportion relative to total vegetables (odds ratio [OR] = 6.24, 95% confidence interval [CI] = 3.55-10.97; P for trend <0.001 for highest vs. lowest quartiles of intake) than as the absolute consumed amount (OR = 2.47, 95% CI = 1.45-4.21; P for trend = 0.015 for highest vs. lowest quartiles of intake).

CONCLUSIONS: These results suggest that not only the amount of total vegetable intake but also the amounts of different types of vegetable (i.e., pickled or nonpickled) and their proportions relative to total vegetables are significantly associated with the risk of breast cancer.

NUTRITION

Aune, D, E. De Stefani, A. L. Ronco, et al.

Egg Consumption and the Risk of Cancer: A Multisite Case-Control Study in Uruguay.

Asian Pacific Journal of Cancer Prevention: Apjcp. 2009 105: 869-876.

BACKGROUND: Previous studies have suggested that egg consumption may increase the risk of colorectal cancer and some other cancers. However, the evidence is still limited. **METHODS:** To further explore the association between egg intake and cancer risk we conducted a case-control study of 11 cancer sites in Uruguay between 1996 and 2004, including 3,539 cancer cases and 2,032 hospital controls.

RESULTS: In the multivariable model with adjustment for age, sex (when applicable), residence, education, income, interviewer, smoking, alcohol intake, intake of fruits and vegetables, grains, dairy products, fatty foods, meat, energy intake and BMI, there was a significant increase in the odds of cancers of the oral cavity and pharynx (OR= 2.02, 95% CI: 1.19-3.44), upper aerodigestive tract (OR= 1.67, 95% CI: 1.17-2.37), colorectum (OR= 1.64, 95% CI: 1.02-2.63), lung (OR= 1.59, 95% CI: 1.10-2.29), breast (OR= 2.86, 95% CI: 1.66-4.92), prostate (OR= 1.89, 95% CI: 1.15-3.10), bladder (OR= 2.23, 95% CI: 1.30-3.83) and all cancer sites combined (OR= 1.71, 95% CI: 1.35-2.17) with a high vs low egg intake.

CONCLUSIONS: We found an association between higher intake of eggs and increased risk of several cancers. Further prospective studies of these associations are warranted.

Kim, S, D. P. Sandler, J. Galanko, C. Martin and R. S. Sandler.

Intake of Polyunsaturated Fatty Acids and Distal Large Bowel Cancer Risk in Whites and African Americans.

Am J Epidemiol. 2010 May 1; 1719: 969-979.

BACKGROUND: Long-chain omega-3 polyunsaturated fatty acids (PUFAs) may have antineoplastic properties in the colon. **METHODS:** The authors examined the association between intakes of different PUFAs and distal large bowel cancer in a population-based case-control study of 1,503 whites (716 cases; 787 controls) and 369 African Americans (213 cases; 156 controls) in North Carolina (2001-2006).

RESULTS: Unconditional logistic regression was used to estimate odds ratios and 95% confidence intervals for distal large bowel cancer risk in relation to quartiles of PUFA intake. Increased consumption of long-chain omega-3 PUFAs was associated with reduced risk of distal large bowel cancer in whites (multivariable odds ratios = 0.88 (95% confidence interval (CI): 0.63, 1.22), 0.69 (95% CI: 0.49, 0.98), and 0.49 (95% CI: 0.34, 0.71) for second, third, and highest vs. lowest quartile) ($P(\text{trend}) < 0.01$). Intake of individual eicosapentaenoic acids and docosahexaenoic acids was inversely related to distal large bowel cancer risk, whereas the ratio of omega-6 to long-chain omega-3 PUFAs was associated with increased risk of distal large bowel cancer in whites, but not among African Americans ($P(\text{interaction}) < 0.05$).

CONCLUSIONS: Study results support the hypothesis that long-chain omega-3 PUFAs have beneficial effects in colorectal carcinogenesis. Whether or not the possible benefit of long-chain omega-3 PUFAs varies by race warrants further evaluation.

VITAMIN D

Hofmann, JN, K. Yu, R. L. Horst, R. B. Hayes and M. P. Purdue.

Long-Term Variation in Serum 25-Hydroxyvitamin D Concentration among Participants in the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial.

Cancer Epidemiology Biomarkers and Prevention. 2010 April; 194: 927-931.

BACKGROUND: Molecular epidemiologic studies of vitamin D and risk of cancer and other health outcomes usually involve a single measurement of the biomarker 25-hydroxyvitamin D [25(OH)D] in serum or plasma. However, the extent to which 25(OH)D concentration at a single time point is representative of an individual's long-term vitamin D status is unclear. **METHODS:** To address this question, we evaluated within-person variability in 25(OH)D concentrations across serum samples collected at three time points over a 5-year period among 29 participants in the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial. Blood collection took place year-round, although samples for a given participant were collected in the same month each year.

RESULTS: The within-person coefficient of variation and intraclass correlation coefficient were calculated using variance components estimated from random effects models. Spearman rank correlation coefficients were calculated to evaluate agreement between measurements at different collection times (baseline, +1 year, +5 years). The within-subject coefficient of variation was 14.9% [95% confidence interval (CI), 12.4-18.1%] and the intraclass correlation coefficient was 0.71 (95% CI, 0.630-0.88). Spearman rank correlation coefficients comparing baseline to +1 year, +1 year to -5 years, and baseline to +5 years were 0.65 (95% CI, 0.37-0.82), 0.61 (0.29-0.81), and 0.53 (0.17-0.77), respectively. Slightly stronger correlations were observed after restricting to non-Hispanic Caucasian subjects.

CONCLUSION: These findings suggest that serum 25(OH)D concentration at a single time point may be a useful biomarker of long-term vitamin D status in population-based studies of various diseases.

PSYCHOLOGICAL ADJUSTMENT

Hauksdottir, A, U. Valdimarsdottir, C. J. Furst, E. Onelov and G. Steineck.

Health Care-Related Predictors of Husbands' Preparedness for the Death of a Wife to Cancer - a Population-Based Follow-Up.

Ann Oncol. 2010 Feb; 212: 354-361.

BACKGROUND: If we can learn how to increase preparedness before the death of a loved one, we can possibly decrease the next-of-kin's long-term morbidity. **METHODS:** In a population-based study, 691 of 907 (76%) men in Sweden who lost a wife to cancer 4-5 years earlier answered an anonymous questionnaire about their preparedness at the time of their wife's death as well as potential predictors for preparedness.

RESULTS: A final logistic regression model indicates following predictors for preparedness, among others: the length of the widower's intellectual awareness time before his wife's death [relative risk (RR) 4.1, confidence interval (CI) 2.7-6.1], the widower could take in the information that his wife's disease could not be cured (RR 3.5, CI 2.3-5.2), the couple had arranged their economical affairs (RR 1.5, CI 1.3-1.7), the wife had stayed at a palliative care unit during her last months of life (RR 1.2, CI 1.1-1.4) and health care personnel supported the husband to participate in his wife's care (RR 1.6, CI 1.3-2.1).

CONCLUSIONS: We identified several care-related factors that may influence the preparedness of men before their wife's death to cancer. These factors can be considered in future intervention studies aiming at influencing preparedness before the death of a loved one.

NURSES AND CANCER

Kjaer, TK and J. Hansen.

Cancer Incidence among a Large Cohort of Female Danish Registered Nurses.

Scandinavian Journal of Work, Environment and Health. 2009 December; 356: 446-453.

BACKGROUND: Nurses are potentially exposed to carcinogens in their working environment. We investigated the risks for 21 types of cancers in Danish nurses. **METHODS:** We identified 92 140 female nurses from the computerized files of the Danish Nurses' Association. By record linkage, we reconstructed information on employment since 1964 using data from a national pension fund; information on vital status and reproduction was obtained from the Central Population Register. Each woman was followed-up from 1980-2003 in the Danish Cancer Registry. We calculated standardized incidence ratios (SIR) and 95% confidence intervals (95% CI). Using Poisson regression models, we made internal comparisons in subgroups of nurses, adjusting for potential confounders.

RESULTS: We documented 8410 cancers during follow-up and found significantly increased SIR for breast cancer (SIR 1.1, 95% CI 1.1-1.2), cancers of the brain and nervous system (SIR 1.2, 95% CI 1.1-1.3), melanoma (SIR 1.2, 95% CI 1.1-1.3), and other skin cancers (SIR 1.2, 95% CI 1.1-1.2). Significantly decreased risks were observed for alcohol- and tobacco-related cancers. Nurses who were accredited by the Association after 1981 had significantly increased risks for thyroid cancer (SIR 1.9, 95% CI 1.3-2.5) and cancers of the brain and nervous system (SIR 1.5, 95% CI 1.2-1.9). Former nurses had significantly increased SIR for all cancers combined and breast cancer the first ten years after leaving the profession. In a Poisson regression analysis of breast cancer and duration of employment in hospitals, adjusted for reproductive factors, nurses had an increase risk the first 25 years of employment, but not for longer periods.

CONCLUSION: The increased risk of breast cancer and the decreased risk of alcohol- and tobacco-related cancers support the findings of most other studies on nurses. The elevated risks for cancers of the breast, brain, nervous system, and thyroid warrant further study.



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