Cancer Epidemiology, Biomarkers & Prevention

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The following are the 17 highest scoring abstracts of those submitted for presentation at the 42nd Annual ASPO meeting held March 11–13, 2018, in New York, NY.

Overall and Visceral Adiposity Are Associated with Incident Cardiovascular Disease among Breast Cancer Patients: Results from the B-SCANS Study

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It is assumed that total and visceral adiposity increase cardiovascular disease (CVD) risk among breast cancer survivors; yet, these associations have not been studied, and could differ from non-cancer populations due to the modifying effects of cancer treatment. METHODS: We studied 2,630 Stage I–III breast cancer patients without pre-existing CVD diagnosed at Kaiser Permanente (2006–2013). We quantified body composition from computed tomography scans taken at breast cancer diagnosis. The main exposures were total and visceral adiposity indices (cm2/m2), examined in tertiles. From ICD codes, we identified non-fatal stroke, coronary artery disease (CAD), and heart failure, and a composite outcome including CVD death (CVD). We estimated hazard ratios (HR) and 95% confidence intervals (CI) adjusting for age, smoking, tumor (stage, grade, and ER/PR and HER2 status) and treatment (chemotherapy and/or radiation) factors, skeletal muscle index (SMI), and body mass index (BMI) residuals. We assessed effect modification via product terms of adiposity with age (>=/<55 years), sarcopenia (SMI>=/<40 cm2/m2) and chemotherapy (yes/no). RESULTS: At diagnosis, mean (SD) age was 55 (11) years and BMI was 28 (6) kg/m2. Over a maximum follow-up of 11 years, 669 CVD events occurred. Independent of BMI and other covariates, women in the highest (v. lowest) tertile of total adiposity had a higher risk of CVD, heart failure, stroke and CAD; HRs (95%CI) were 1.45 (1.15–1.81), 1.78 (1.24–2.57), 1.89 (1.25–2.87), and 1.52 (0.83–2.79), respectively. Results were similar for visceral adiposity, and by age and sarcopenia, but were stronger for women receiving chemotherapy: e.g., the HR (95%CI) for the highest (v. lowest) tertile of total adiposity with CVD risk was 1.76 (1.33–2.33) for women who received chemotherapy versus 0.93 (0.63–1.38) for women who did not, p- interaction = 0.04. CONCLUSIONS: Women who enter a breast cancer diagnosis with greater total and visceral adiposity are at higher risk of subsequent CVD, particularly if they receive chemotherapy. Our results suggest that body composition - independent of BMI and other factors - can identify patients with high CVD risk for additional monitoring, tailored treatment plans and targeting of preventive interventions.

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Breast Density and Risk of Invasive Breast Cancer among Older Women Undergoing Mammography: The Breast Cancer Surveillance Consortium Cohort Study

Braithwaite D, Miglioretti DL, Zhu W, Demb J, Trentham-Dietz A, Sprague B, Tice JA, Onega T, Henderson LM, Buist DSM, Walter LC, Kerlikowske K

This study examined whether breast density is associated with risk of breast cancer in women age ≥65 years undergoing screening mammography in community practice. Methods: We used prospective cohort data between 1996 and 2012 from the Breast Cancer Surveillance Consortium (BCSC). We calculated separate cumulative incidence models for breast cancer incidence according to Breast Imaging Reporting and Data System (BI-RADS) breast density for women ages 65–74 and ages ≥75. Multivariable Cox proportional hazards regression models were fitted to determine the risk of invasive breast cancer adjusted for BCSC registry, race/ethnicity, BMI, hormone therapy use and benign breast disease. Results: Among the 403,268 women included in the study, approximately 40% were ages ≥75. The annual incidence rate of invasive breast cancer increased with increasing breast density among women ages 65–74 [BI- RADS fatty breasts: 2.2% (95% CI, 2.1%–2.4%) vs. heterogeneously or extremely dense breasts: 4.7% (95% CI, 4.6%–4.9%)] and women ages 75+ [BI-RADS fatty breasts: 2.3% (95% CI, 2.1%–2.5%) vs. heterogeneously or extremely dense: 4.3% (95% CI, 4.1%–4.5%)]. Women with BI-RADS fatty breasts had a decreased risk of breast cancer among women ages 65–74 [HR: 0.66 (95% CI: 0.58%–0.78%) and women ages ≥75 [HR: 0.73 (95% CI: 0.62%–0.87%). Women with BI-RADS heterogeneously or extremely dense breasts were found to have increased risk of breast cancer among women ages 65–74 [HR: 1.39 (95% CI: 1.28%–1.51%)] and women ages ≥75 [HR: 1.23 (95% CI: 1.10%–1.37%)]. Conclusions: Older women with higher BI-RADS density had a significantly increased risk of breast cancer. These findings add further evidence that breast density continues to be associated with an increased risk of breast cancer, even among women age ≥75 years.

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Pre-treatment Dietary Patterns Are Associated with the Presence of Symptoms 1 Year after Diagnosis in Patients with Head and Neck Cancer

Crowder SL, Mondul AM, Tang YC, Pepino MY, Sarma KP, Rozek LS, Wolf GT, Arthur AE

Ninety percent of head and neck cancer (HNC) survivors experience disease and treatment related symptoms. Diet has the

potential to reduce inflammation, modulate epigenetic changes and affect biological processes involved in the pathogenesis of symptoms. The objective of this study was to determine if pre-treatment dietary patterns are associated with the presence of symptoms 1-year after diagnosis. Methods: This was a longitudinal study of 295 newly diagnosed HNC patients. All patients completed a food frequency questionnaire and epidemiologic health survey. Self-reported symptoms were assessed pre-treatment and 1-year after diagnosis using a Likert scale ranging from "1: not at all bothered" by symptom to "5: extremely bothered". Symptom scores were dichotomized as "not at all" vs. "slight - extremely". Principal component analysis was used to derive pre-treatment dietary patterns. Multivariable logistic regression models examined the association of derived dietary patterns (fit by quartiles) and seven symptoms (trismus, xerostomia, dysphagia of liquids, dysphagia of solids, difficulty chewing, taste and mucositis). An overall symptom summary score was calculated (range 8–39) and dichotomized as <17 vs. ≥17. This cut-off was chosen by examining the distribution of scores and categorizing into two distinct subgroups naturally present in the data. Results: Two dietary patterns emerged: Prudent (high intakes of vegetables, fruit, fish, poultry, and whole grains) and Western (high intakes of red and processed meats, refined grains, potatoes, and French fries). After adjusting for age, baseline symptoms, tumor site, cancer stage, smoking, calories and HPV status, significant inverse associations were observed between pre-treatment Prudent pattern score and dysphagia of liquids ($P = 0.01$), dysphagia of solids ($P = 0.02$) and difficulty chewing ($P = 0.02$) at 1 year post- diagnosis. A statistically significant inverse association was observed between the overall symptom summary score and the Prudent pattern ($P < 0.001$). No significant associations were observed between the Western pattern and symptoms. Conclusion: Consumption of a pre-treatment Prudent diet may help reduce the risk of symptoms such as dysphagia and difficulty chewing 1-year after diagnosis in HNC survivors.

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Sleep and Cancer Incidence in Alberta's Tomorrow Project Cohort

McNeil J, Barberio A, Friedenreich CM, Brenner DR

We aimed to investigate the association between self-reported sleep duration and sleep timing midpoint with all- and site-specific cancer incidence in Alberta's Tomorrow Project (ATP) cohort. Methods: The analysis for sleep duration included 46,300 Albertans aged 35–65 years at baseline from the ATP cohort recruited from 2001–2015. Sleep timing midpoint (wake-time $-\frac{1}{2}$ sleep duration) was assessed in a subset of ATP participants ($n = 19{,}820$). Cancer incidence was determined through record linkage with the Alberta Cancer Registry in December 2016. Cox proportional hazard regression models evaluated the effects of sleep duration and sleep timing midpoint categories on all- and site-specific (breast, colorectal, lung, prostate, endometrial and hematologic) cancer incidence. Models were adjusted for age, sex (non sex-specific cancers), highest level of education, total household income, marital status, alcohol intake, smoking status, body mass index, family history of cancer, presence of at least one medical condition/co-morbidity, menopausal status (female cancers only) and sleep duration (sleep timing midpoint analysis only). Results: By 2016, there were 3,034 incident cases of cancer in this cohort. A statistical trend was noted for an increased risk of all cancers in participants reporting > 9 hours of sleep/night compared to 7–9 hours of sleep/night (hazard ratio (HR) = 1.16, 95% confidence interval (CI): 0.98–1.36; $P = 0.08$). Reporting > 9 hours of sleep/night compared to 7–9 hours of sleep/night was also associated with an increased incidence of endometrial cancer (HR = 2.09, 95% CI: 1.16–3.76; $P = 0.01$). A later sleep timing midpoint (>4:08 AM) versus an intermediate sleep timing midpoint (3:47 AM–4:08 AM) was associated with an increased risk of all (HR = 1.19, 95% CI: 1.03–1.37; $P = 0.02$) and breast (HR = 1.64, 95% CI: 1.18–2.26; $P = 0.003$) cancer incidence. Conclusions: These novel findings provide evidence regarding the important role of sleep in cancer etiology. Interventions that put emphasis on proper sleep hygiene for cancer prevention are needed.

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Empowering Latinas to Obtain Breast Cancer Screenings: Comparing Intervention Effects, Part 2

Molina Y, San Miguel LG, Tamayo L, Sanchez-Diaz C, Robledo C, Peña K, Lucio A, Hernandez O, Arroyo J, Medina M, Coronado N, Irma V

We compare the effects of breast cancer education and empowerment approaches on non-adherent Latinas' breast health behaviors and dissemination of health information. Methods: The setting for this ongoing, quasi-experimental trial is two Latino, lower income communities in Chicago. Women were recruited via two community-based organizations and snowball sampling. Eligibility criteria were: 1) age of 52–74; 2) lack of screening within past 2 years; 3) no previous breast cancer diagnosis; and, 4) no health volunteerism experience. Women were assigned to a three week group intervention (3 2 hour sessions). The education intervention is administered in East Side/South Chicago and the empowerment intervention is administered in Pilsen/Little Village to avoid contamination effects. The education intervention has 3 sessions focused on early detection and prevention (diet, physical activity). The empowerment intervention has 3 sessions focused on early detection, sharing information with family/friends, and health volunteerism. Navigation is provided if women wish to obtain mammograms. Three questionnaires are given at baseline, post-intervention, and a 6 month follow-up. Results: Among our 68 participants (34 education; 34 empowerment), 87% were born in Mexico; 59% had <9th grade education; 52% had a median household income of <$10K; and, 51% were uninsured. The average age was 61.21 (SD = 6.20). Relative to education participants, more empowerment participants have scheduled mammograms (94% vs. 74%; $P = 0.05$) and obtained mammograms (77% vs. 38%, $P = 0.001$). Empowerment participant also spoke to more individuals about breast health relative to education participants (M = 6.24, SD = 5.30 vs. M = 3.00, SD = 3.04, $P = 0.003$). A greater proportion of engagement participants also spoke about specific types of breast cancer screening (58% vs. 38%, $P = 0.01$) and discussed breast cancer across multiple settings (58% vs. 24%, $P = 0.003$). Discussion: The empowerment approach may be particularly effective in

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