LONGITUDINAL CHANGES IN THE INFLAMMATORY POTENTIAL OF DIET AND RISK OF CANCER IN WOMEN

**Introduction:** The dietary inflammatory index (DII) measured at one point in time has been associated with cancer risk in previous studies; however, data are lacking regarding the change in DII over time and how these changes impact cancer risk. We assessed changes in the DII, and evaluated associations between cumulative history, and changes over time in dietary inflammatory potential, and risk of colorectal cancer (CRC) and breast cancer (BRCA).

**Methods:** Study participants were women aged 50-79 years recruited from 1993-1998 into the Women’s Health Initiative (WHI) Observational Study (OS) and Dietary Modification Trial (DMT), and followed through September 30, 2010. The DII was calculated from repeated food frequency questionnaires (FFQ) data in the OS (n= 82,960) at baseline and Year 3, and in the DMT (n=48,686) at up to 11 time points. Univariate generalized estimating equations were used to compare mean DII over time, adjusting for multiple comparisons. We calculated ten cumulative averages of DII, incrementally from baseline to Year 10, categorized each average into quintiles, and estimated odds ratios (OR) and 95% confidence intervals (95%CI) for CRC, colon, rectal cancer and invasive BRCA incidence by DII quintiles in multivariable-adjusted logistic regression models. We also derived patterns of changes in DII quintiles between baseline
and Year 3, and calculated hazard ratios (HR) for CRC, colon, rectal and breast cancer incidence, including molecular and histologic BRCA subtypes, using multivariable-adjusted Cox proportional hazards regression models. **Results:** In the OS, mean DII decreased from -0.98 (±2.67) at baseline to -1.33 (±2.71) at Year 3. In the DMT, DII decreased from -0.36 (±2.56) to its lowest point of -1.61 (±2.70) at Year 3 in the intervention arm and from -0.35 (±2.56) to its lowest point of -0.95 (±2.66) at Year 3 in the control arm. These changes were influenced by education, race/ethnicity, and BMI. During an average 11.7 years, 1,262 cases of CRC and 5,558 cases of BRCA were identified. ORs for the association between high DII scores and CRC were consistently elevated in the first seven years of follow up, for colon cancer with multivariable-adjusted ORs ranging from 1.26 to 1.43 in tertile 3 vs. 1, while no significant associations were observed for rectal cancer. Compared to participants in the anti-inflammatory stable category, risk was increased in participants with a pro-inflammatory stable diet, for CRC (HR, 1.32; 95%CI, 1.09, 1.59), and for colon (HR, 1.27; 95%CI, 1.04, 1.56), and rectal (HR, 1.64; 95%CI, 1.03, 2.59) cancers. HRs revealed no significant association between changes in DII and risk of BRCA or its subtypes. **Conclusion:** In this large prospective study of postmenopausal women, dietary inflammatory potential was relatively stable in OS participants, but decreased significantly over time in women enrolled in the DMT. DII changes were modified by education, race/ethnicity and BMI. Long-term pro-inflammatory diets, as well as shorter-term stable pro-inflammatory diets increase the risk of colon cancer and possibly rectal cancer but not breast cancer or its subtypes. Lowering the inflammatory potential of diet could be a means for colon cancer, and potentially rectal cancer prevention.

Susan E. Steck, PhD
James R. Hebert, ScD,
Angela D. Liese, PhD,
JiaJia Zhang, PhD,
Yunsheng Ma, PhD, (UMass Medical School)