

Can nut consumption improve colon cancer survival?

Dagfinn Aune^{1,2,3}

¹Department of Epidemiology and Biostatistics, School of Public Health, Imperial College London, London, UK; ²Department of Nutrition, Bjorknes University College, Oslo, Norway; ³Department of Endocrinology, Morbid Obesity and Preventive Medicine, Oslo University Hospital, Oslo, Norway

Correspondence to: Dr. Dagfinn Aune. Department of Epidemiology and Biostatistics, School of Public Health, Imperial College London, St. Mary's Campus, Norfolk Place, Paddington, London W2 1PG, UK. Email: d.aune@imperial.ac.uk.

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Fadelu *et al.* recently examined the association between nut consumption and survival among patients with stage 3 colon cancer in an article published in the *Journal of Clinical Oncology* (1). Risk factors of incident colon cancer have been comprehensively examined in many previous studies and both dietary and other lifestyle factors have been associated with colon cancer incidence (2-6). Much less is currently known about the association between dietary and lifestyle factors and survival among patients with colon cancer and this article is an important contribution in this regard. The study included 826 stage 3 colon cancer patients which reported their intake of nuts and other food groups using a 131-item food frequency questionnaire. During a median follow-up of 6.5 years 177 patients died and 199 patients experienced cancer recurrence or developed new primary tumors. Increasing nut intake was associated with improved disease-free survival and overall survival with hazard ratios of 0.58 (95% CI: 0.37–0.92) and 0.43 (95% CI: 0.25–0.74) for an intake of nuts of ≥ 2 times per week *vs.* never after adjustment for age, sex, depth of invasion through bowel wall, number of positive lymph nodes, baseline performance status, treatment group, BMI, physical activity, aspirin use and glycemic load. The association with recurrence-free survival was not statistically significant (hazard ratio =0.70, 95% CI: 0.42–1.16). However, in analyses incorporating both pre-diagnostic and post-diagnostic dietary questionnaires, improvements were observed in disease-free survival, recurrence-free survival and overall survival with

hazard ratios of 0.45 (95% CI: 0.33–0.62), 0.46 (95% CI: 0.32–0.64) and 0.43 (95% CI: 0.30–0.61), respectively for ≥ 2 servings of nuts per week *vs.* never. There was little evidence of variation in the association between nut consumption and colon cancer recurrence or mortality when stratified in a number of subgroup analyses including age, sex, treatment, performance status, number of positive lymph nodes, BMI, physical activity, glycemic load, aspirin, microsatellite instability, or mutations in KRAS, BRAF or PIK3CA genes or by COX2 expression. When specific types of nuts were examined in relation to survival, intake of tree nuts were inversely associated with all outcomes with hazard ratios of 0.54 (95% CI: 0.34–0.85), 0.56 (95% CI: 0.33–0.94), and 0.47 (95% CI: 0.27–0.82), respectively, for an intake of ≥ 1 time per week *vs.* never, while the hazard ratios for peanuts were 0.81 (95% CI: 0.53–1.23), 0.97 (95% CI: 0.61–1.53), and 0.60 (95% CI: 0.37–0.98), suggesting a better survival with intake of tree nuts than for peanuts. This is consistent with data from a recent meta-analysis of nut consumption and overall cancer risk, where an inverse association was observed for tree nuts, but not for peanuts (7). Nuts contain several constituents including ellagic acid (walnuts), anacardic acid (cashews), genistein (hazelnuts, peanuts), resveratrol (peanuts), inositol (cashews, peanuts) and fiber (all nuts) that could influence cancer risk and survival by inducing cell cycle arrest, apoptosis, and by inhibiting cell proliferation, migration, invasion, angiogenesis, and metastasis (8-12). A cell study suggested

that a walnut phenolic extract may suppress colon cancer growth by regulating cancer stem cells (13) and a study in mice showed that feeding of walnuts inhibited colorectal cancer growth by suppressing angiogenesis (14). This is the first study to investigate the association between nut consumption and survival among colon cancer patients. A high intake of nuts has been consistently associated with lower risk of coronary heart disease, total cancer and premature mortality in population-based epidemiological studies and there is suggestive evidence for a reduced risk of mortality from respiratory disease, infections and diabetes as well (7). Given the limited data on nut consumption and both cancer risk and cancer survival as well as these promising results further studies are needed on nut consumption in relation to both cancer incidence and survival.

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Footnote

Conflicts of Interest: The author has no conflicts of interest to declare.

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