High-Fiber Diet May Not Protect Women Against Colorectal Cancer

Jacobs ET, Lanza E, Alberts DS, et al. Fiber, sex, and colorectal adenoma: results of a pooled analysis. Am J Clin Nutr 2006;83:343–9.

Study Overview

Objective. To determine if dietary fiber reduces colorectal adenoma recurrences differently in men and women.

Design. Pooled analysis of 2 large, randomized trials.

Setting and participants. Data from 3209 participants in the Wheat Bran Fiber (WBF) trial and the Polyp Prevention Trial (PPT) were pooled and analyzed for effect of a dietary intervention on colorectal adenoma recurrence. In the WBF trial, patients who had recently undergone colorectal polypectomy were randomized to receive either high-fiber (13.5 g/day) or low-fiber (2 g/day) dietary supplementation for 3 years; 1304 patients completed the trial. The PPT compared an intervention diet that included increased fiber and decreased fat intake to participants' usual diets; 1905 participants completed the trial. For both studies, dietary fiber was assessed using U.S. Department of Agriculture food-composition tables. WBF participants underwent postrandomization colonoscopies at 1 and 3 years, while PPT participants underwent colonoscopies at 1 and 4 years.

Data pooling. In the pooled analysis, the intervention group consisted of WBF trial participants randomized to the high-fiber diet and PPT participants randomized to the intervention diet group. The reference group consisted of WBF trial participants allocated to the low-fiber diet and PPT participants assigned to follow their usual diet.

Main outcome measures. The primary study outcome was colorectal adenoma recurrence in the pooled population overall and in males versus females.

Main results. There were several baseline differences between participants in the 2 trials. WBF participants tended to be older and were more likely to be white, have a prior colorectal polyp, use aspirin, and consume more dietary fiber at baseline than participants in the PPT. WBF trial participants were less likely to have a family history of colorectal cancer and less likely to have had multiple polyps detected on baseline colonoscopy. There were no differences between the groups with respect to sex, hormone replacement therapy use, smoking, or alcohol use. In the pooled analysis, overall there was statistically insignificant reduction in colorectal adenoma recurrence for patients randomized to the intervention arms (adjusted odds ratio [OR], 0.91 [95% confidence interval {CI}, 0.78–1.06]). In the sex-specific analysis, men had a statistically significant reduction in adenoma recurrence (adjusted OR, 0.81 [95% CI, 0.67–0.98]), but for women, increased fiber did not reduce adenoma recurrence (adjusted OR, 1.13 [95% CI, 0.87–1.48]). Men randomized to the dietary intervention also had a decreased adjusted odds of advanced recurrent adenoma, but this was not statistically significant (adjusted OR, 0.85 [95% CI, 0.64–1.12]). Women randomized to the intervention had a nonstatistically significant increased odds of advanced adenoma recurrence (adjusted OR, 1.19 [95% CI, 0.76–1.86]).

Conclusion. Increased dietary fiber appears to offer protection against colorectal adenoma recurrence in men but not in women.

Commentary

Evidence that supports the role of dietary fiber in reducing colon cancer risk was based on geographic variations of colorectal cancer incidence, with lower rates of colorectal cancer found in regions with higher dietary fiber intake. Observational studies have produced mixed evidence to support this finding, and clinical trials have been even less encouraging [1–5]. One emerging and unexpected pattern is that studies that recruited only women tended to be less likely to demonstrate a beneficial effect with fiber compared with studies of both men and women or men only. Indeed, in clinical trials, gender subgroup analysis demonstrated a trend toward protection in men only. This study by Jacobs et al sought to further evaluate these observations. Both the WBF and PPT trials recruited individuals who had recently undergone a colonic polypectomy, both assessed adenoma recurrence at 1 year and then subsequently at either 3 or 4 years, and both used a similar measure of dietary fiber consumption [3,4].

Despite these similarities, an important difference was in the intervention. While the WBF trial used a dietary fiber

supplement, PPT participants increased dietary fiber and reduced dietary fat. As such, it is unclear if the reduction in dietary fat may have contributed to the lowering of recurrence of adenomatous polyps. A recently published large randomized trial found no reduction in colorectal cancer in individuals randomized to a low-fat diet; however, this study only enrolled women [6]. Thus, it is unclear how dietary fat might impact colorectal cancer risk in men. Despite these findings, it seems likely that a high-fiber diet does reduce the risk of recurrent colonic adenomas and that this effect is primarily found in men. Future research will be necessary to understand why these gender differences exist with respect to fiber and colon cancer risk.

Applications for Clinical Practice

Although mechanisms underlying the gender differences are unknown, results found by Jacobs et al support the findings of earlier studies suggesting that dietary fiber may be more beneficial for men than women for colorectal adenoma prevention. Nevertheless, as fiber intake has beneficial effects on blood pressure, cholesterol, and constipation, providers should not discourage female patients interested in increasing their dietary fiber intake.

–Review by Harvey J. Murff, MD, MPH

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