Adherence to Screening Guidelines for Colorectal Cancer: The Impact of Genetic Testing and Counseling

Hadley DW, Jenkins JF, Dimond E, et al. Colon cancer screening practices after genetic counseling and testing for hereditary nonpolyposis colorectal cancer. J Clin Oncol 2004;22:39–44.

Study Overview

Objective. To assess the impact of genetic counseling and testing (GCT) on the use of endoscopic screening procedures and adherence to recommended screening guidelines in asymptomatic at-risk individuals from families known to carry a hereditary nonpolyposis colorectal cancer (HNPCC) mutation.

Design. Prospective cohort study.

Setting and participants. Adults without a prior history of cancer, at 50% risk of carrying their family's previously identified deleterious HNPCC mutation, and who agreed to undergo GCT and fill out questionnaires at baseline and 6 and 12 months post-GCT were included. Data on colonoscopy and flexible sigmoidoscopy screenings that were collected before GCT and 6 and 12 months post-GCT were analyzed. Identification of family members at 50% risk was initiated through a first-degree relative identified as carrying the HNPCC mutation. Genetic testing was offered after comprehensive education and counseling. Cancer screening recommendations based on published guidelines were provided in both the initial genetic and follow-up counseling sessions. Those recommendations included a colonoscopy every 1 to 3 years for mutation-positive persons and general population screening for mutation-negative persons (ie, flexible sigmoidoscopy every 3 to 5 years after age 50 years). Health-related behaviors were assessed by self-report.

Main outcome measures. Use of endoscopic screening and adherence to recommended guidelines for the relevant mutation status. Mutation status, age, sex, employment, and income were analyzed as predictor variables. Use was a dichotomous variable measuring whether a participant had at least 1 endoscopy in a specified time period. Adherence was also a dichotomous variable measuring whether a participant's behavior was consistent with the actual endoscopic screening recommendation within the 12-month period after GCT. Nonadherent individuals were subclassified as hypovigilant if they did not engage in screening when recommended or hypervigilant if they engaged in screening more frequently than recommended.

Main results. Mutation testing determined that 39 individuals (70%) were truly negative and 17 (30%) were positive for a deleterious HNPCC mutation. Among mutation-negative individuals, use of colonoscopy and flexible sigmoidoscopy decreased significantly between pre- and post-GCT ($P < 0.001$ for both). Among mutation-positive individuals, there was no significant increase ($P = 0.24$) in use. Age also was associated with use of endoscopic screening after GCT ($P = 0.03$). Eleven (20%) of 56 individuals were classified as nonadherent with recommendations in the 12-month period after GCT. Mutation status (odds ratio [OR], 7.5; $P = 0.02$) and employment (OR, 8.6; $P = 0.025$) were associated with nonadherence to screening guidelines. More mutation-negative individuals strictly adhered to guidelines than did mutation-positive individuals (87% versus 65%).

Conclusion. Genetic counseling and testing for HNPCC significantly influences endoscopic screening and adherence to colorectal cancer screening guidelines.

Commentary

HNPCC is the most prevalent form of hereditary colorectal cancer, accounting for an estimated 5% of all cases. An individual with a deleterious HNPCC mutation has at least an 80% lifetime risk of developing colorectal cancer. Studies have demonstrated that routine endoscopic screening in these patients reduces the risk and improves survival [1,2].

Hadley et al conducted a small prospective study evaluating the use of endoscopic screening and guideline adherence in a group of HNPCC at-risk individuals. Risk was based on family history, but individuals were classified as either positive or negative in terms of personally having a HNPCC mutation. The authors found that genetic testing and counseling directly influenced adherence with screening guidelines in at-risk individuals. Specifically, screening adherence decreased once genetic testing confirmed a negative HNPCC status. Conversely, screening increased, albeit not significantly, when testing was positive.

The study population was small, and the mutation-positive and mutation-negative groups were unbalanced in size, age, and economic measures, making direct comparisons between

subsets potentially flawed. As well, the study's outcomes are based on definitions of adherence derived from published guidelines and may not reflect clinical value for individual patients. Individuals who were regarded as hypervigilant in terms of screening behavior were regarded as nonadherent. This subset likely represents a distinct clinical group from those individuals who infrequently or never get screened, the so-called hypovigilant nonadherent subset.

Notwithstanding the limitations and potential selection bias of this small study, the results are intriguing. Understanding screening behavior will be increasingly important as more genetic tests and screening tools become available. Studying screening guideline adherence may help in redefining guidelines themselves and may improve allocation of health care resources. Ultimately, the important question is whether improved adherence leads to improved long-term outcomes such as survival.

Applications for Clinical Practice

Individuals at risk for HNPCC should receive genetic counseling and be offered testing. HNPCC mutation carriers should undergo regular endoscopic screening according to published guidelines. Resources should be developed to help these patients receive counseling and screening.

–Review by David R. Spigel, MD

References

1. Jarvinen HJ, Aarnio M, Mustonen H, et al. Controlled 15-year trial on screening for colorectal cancer in families with hereditary nonpolyposis colorectal cancer. Gastroenterology 2000; 118:829–34.
2. Johnson KA, Trimbath JD, Petersen GM, et al. Impact of genetic counseling and testing on colorectal cancer screening behavior. Genet Test 2002;6:303–6.

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