Colorectal Cancer Screening: Sifting Through the Evidence

Bernard Levin

Worldwide, colorectal cancer is the third most common form of cancer in men and the second in women, with approximately 875,000 new cases diagnosed annually with 570,000 deaths (1). In the United States, colorectal cancer is the fourth most common cancer and the second leading cause of cancer death. Annually, approximately 129,000 new cases of colorectal cancer are diagnosed, with 57,000 associated deaths (2). Early detection through effective screening is one of the strategies to decrease mortality from colorectal cancer.

The evidence to support the effectiveness of population-based screening by means of fecal occult blood testing (FOBT) and flexible sigmoidoscopy continues to mount (3). FOBT screening has been extensively studied in three prospectively randomized controlled trials involving more than 250,000 participants, one in the United States, one in the U.K., and one in Denmark (4–6). The University of Minnesota trial involving nearly 47,000 volunteers (men and women aged 50–80 years) was the first long-term randomized controlled study of FOBT screening to report definitive endpoint results (4). In 1993, after 13 years of screening and follow-up, the study investigators reported a 33% reduction in mortality from colorectal cancer in a group screened annually with Hemoccult® slides, mostly rehydrated, (Smith-Kline Diagnostics, San Jose, CA). More recently, the English (5) and Danish (6) studies showed statistically significant mortality reductions of 15% and 18%, respectively, from biennial FOBT without rehydration. The University of Minnesota trial also evaluated biennial screening as reported in this issue of the Journal (7). After 18 years of follow-up, the biennial group had a 21% lower colorectal cancer mortality rate than the control group (rate ratio, 0.79; 95%, CI = 0.62–0.97). Early in the study, the cumulative colorectal cancer mortality was greater in the biennial than in the control group, a trend that was reversed by the 11th year.

The finding of a beneficial effect of biennial screening (7) is of considerable public health importance and confirms the findings of the other two randomized, controlled trials. However, in trying to understand better these results and their implications, it would be of great interest to know the relative incidence of early stage cancer in the annual, biennial and control groups. The reduction in stage IV (8) cancer could be due to earlier detection of cancer or it could be due to a reduction in incidence attributable to adenoma detection and removal, as alluded to by the authors in a recent publication (9).

Fletcher (10) has suggested that in reporting results of screening programs, it is important to calculate not only relative risk reduction but also absolute risk reduction incorporating the number needed to screen. Towler et al. (11) have used this approach to evaluate screening programs in terms of benefit and potential harm. Reduction in colorectal cancer mortality and a possible reduction in incidence through detection and removal of adenomas are very important benefits of screening. Furthermore, individuals who undergo colonoscopy because of a “false-positive” screen and who are found to have no adenomas probably do not need to be screened for a decade. Detection of early stage colorectal cancer also may involve less postsurgical care such as adjuvant therapy. Harmful effects of screening include complications caused by colonoscopy that are infrequent and anxiety and expense caused by false-positive screening tests.

One of the potential limitations to the benefits of colorectal cancer screening as recommended by the U.S. Preventive Services Task Force (12), the American Cancer Society (13), and a consortium of five medical and surgical gastroenterological societies (14) is the low compliance rate outside of study populations. For example, in the 1992 National Health Interview Study, 26% of the population more than 49 years of age reported an FOBT within the prior 3 years and 33% reported ever having had a sigmoidoscopy (15). Even as we strive to develop better screening methods (16,17), greater compliance with existing recommendations would substantially decrease morbidity and mortality from colorectal cancer. The implementation of biennial rather than annual FOBT may also enhance acceptability. In addition, recent legislation authorizing coverage by Medicare of colorectal cancer screening services should provide a substantial incentive to the public and medical care system to enhance compliance. While other strategies, such as chemoprevention (18) or life style changes, may ultimately surpass the effectiveness of periodic screening, for the present, screening with FOBT remains the only proven strategy from randomized prospective trials. For example, the decades-old assumption that a high-fiber diet protects against the development of colorectal cancer has recently been challenged in a large, prospective epidemiologic study (19). As science continues to grapple with issues related to the primary prevention of colorectal cancer using dietary intervention and chemoprevention, and while we await results from clinical trials, the report by Mandel et al. substantiates the important and clear finding that screening of men and women more than 50 years of age for colorectal cancer can save lives.

REFERENCES

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