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Recommendations for Colorectal Cancer Screening and Surveillance in People

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Abstract

The first contains specific recommendations for screening and surveillance in people at average and at high risk for colorectal cancer. The second section describes the evidence used to develop the recommendations. Screening, diagnostic evaluation, and surveillance strategies are presented as options that the panel thought were acceptable, based on the evidence. The options differ in strength of evidence, size of benefit, clinical performance, and effectiveness in preventing colorectal cancer, simplicity, safety, patient acceptance, cost, and cost-effectiveness.

Keywords: Positive findings; Colonoscopy; Colon neoplasms; Abdominal radiation; Screening

Introduction

Choice of options by individual patients and physicians requires consideration of these factors. A higher level of performance is expected for diagnostic tests than for screening tests. Colonoscopy can examine the entire colon with few false negative or false positive findings and can provide definitive treat-this report contains recommendations for colorectal cancer screening and surveillance in various risk groups. These recommendations and their respective rationale are derived from consideration of the supporting evidence and are summa- screening fobt is established by three randomized and one on randomized controlled trials. Despite these observations and the increased use of colonoscopy for screening, there are surprisingly few data that quantify the impact of colonoscopy on colorectal cancer incidence and mortality in average-risk populations [1]. The national polyp study reported a 76% to 90% reduction in colorectal cancer incidence in patients with adenomas who underwent clearing colonoscopy, and a substantial reduction in mortality after long-term follow-up. However, other adenoma cohort studies, including dietary prevention and chemoprevention trials, have shown lower levels of protection after colonoscopy and polypectomy [2]. The applicability of these mixed findings to the general population is problematic because the individuals enrolled in these studies had adenomas and underwent polypectomy, and may constitute a subgroup at higher risk for developing colorectal cancer than patients without colon neoplasms. Conversely, a recent Canadian claims-based study found that the risk of developing colorectal cancer was 60% to 70% of the risk in the general population after a negative colonoscopy, and remained decreased for more than 10 years after the procedure [3]. However, these findings may not apply to patients who have adenomatous polyps and require polypectomy and subsequent surveillance. In daily clinical practice, average-risk patients who undergo screening colonoscopy are a heterogeneous group, most have no colon neoplasms, a smaller proportion has adenomas and requires subsequent surveillance after polypectomy, and a minority has colorectal cancer. Screening colonoscopy conceptually benefits all of these subgroups: patients with no neoplasms are identified and followed up at relatively long intervals, patients with adenomas undergo polypectomy, which confers protection against colorectal cancer, and patients with colorectal cancer are detected at an early, treatable stage. We report the long-term follow-up of a cohort of such patients after screening colonoscopy [4].

Methodology

Nearly 2 decades ago, one of the authors performed one of the earliest studies of screening colonoscopy in selected average-risk persons19; this report describes the long-term impact of such screening on the incidence and mortality of colorectal cancer for up to 18 years after the initial procedure. Between 1989 and 1993 a written invitation was sent to 5000 physicians and dentists, 12,000 nurses, and all of their spouses, offering a screening colonoscopy [5]. Exclusion criteria included age younger than 50 years, previous colon cancer or adenoma, barium enema or colonoscopy within 3 years for any indication, inflammatory bowel disease, peutzjeghers syndrome, previous breast or uterine cancer, abdominal radiation, coagulopathy or prosthetic heart valve, family history of colonic neoplasia in 2 or more first-degree relatives, and family history of colon cancer in a first-degree relative before the age of 40 [6]. All potential subjects completed a detailed questionnaire to confirm their asymptomatic status. All subjects underwent faecal occult blood testing using hemoccult ii during the week before colonoscopy. In the original study, subjects with positive test results underwent colonoscopy but were not included in the analysis. In the current study, subjects were included irrespective of their baseline faecal occult blood testing status because other subsequent studies of screening colonoscopy have not pre-screened patients with faecal occult blood testing as shown in (Figure 1). Subjects underwent complete colonoscopy to the cecum, and all visualized polyps were resected completely [7]. The histology of all lesions was reviewed by a single pathologist with a special interest in gastrointestinal pathology. Follow-up information was obtained by several methods. All subjects were contacted by telephone, or interviewed personally at the time of clinic or colonoscopy follow-up evaluation at Indiana University [8]. Many subjects who had polyps either at the original examination or at a follow-up examination still were being followed up at Indiana university hospital; their information was retrieved by chart review.

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Figure 1: Screened faecal blood testing.

Figure 2: Monitoring the incidence of colorectal cancer.

Other subjects underwent follow-up evaluation at other institutions; they also were contacted by telephone and permission was obtained to contact their medical providers and to receive copies of follow-up procedures, including pathology results. In instances in which a subject had died, permission was obtained from the next of kin, and the cause of death was determined by contacting their primary health care providers and reviewing death certificates when possible [9]. We compared the observed incidence and mortality rates of colorectal cancer in our study group with the rates expected based on the surveillance, epidemiology, and end results program. Seer monitors the incidence of colorectal cancer and the mortality rate from this malignancy in 10 registries in the United States as shown in (Figure 2). For this study, we used data from the 9 seer registries of Atlanta, Connecticut, Detroit, Hawaii, Iowa, New Mexico, San Francisco–Oakland, Seattle–Puget sound, and Utah. We used age- and sex-specific rates for the calendar years 1989 through 2007 because this period overlapped with the accrual and follow-up phases of the study [10]. For the calendar years 2005, 2006, and 2007, we used the rates for the calendar year 2004 because these were the most recent available data. The index colonoscopy was considered the study entry date; all subjects were followed up until death or study censure date of September 15, 2007. The number of person-years at risk was calculated for each patient as the interval from the index colonoscopy to diagnosis of colorectal cancer, death, or study censure date; subjects with incomplete follow-up were censored at the time of their last documented follow-up evaluation [11]. The median time to colorectal cancer diagnosis and cumulative incidence curves were calculated. Incidence rates were calculated as the number of colorectal cancers divided by person-years of follow-up. The 95% confidence intervals for the number of observed cancers were constructed using a Poisson distribution [12]. We compared the overall colorectal cancer incidence rate in our study group with seer rates as follows.

Discussion

We stratified person-years at risk according to age, sex, and calendar year; the age strata were divided into quintiles starting at age 50. Incidence rates of colorectal cancer in seer corresponding to each age stratum, sex category, and calendar year were multiplied by the number of person-years at risk in that stratum, yielding an expected number of cases. We then summed the expected number of cases per stratum to yield a total number of expected cases. The standardized incidence ratio of the number of observed colorectal cancer cases compared with the number of expected cases based on seer then was calculated [13]. The reduction in the incidence of colorectal cancer was calculated as 100. to calculate the sir using only incident cases that occurred after 2 years of follow-up, we repeated the calculations after excluding patient-years at risk during the first 2 years after the index colonoscopy. A standardized mortality ratio of the number of observed colorectal cancer-specific deaths compared with the number expected based on seer data was calculated in a manner similar to the sir. For all observed cases and deaths, 95% cis were calculated using a Poisson distribution, according to the method of breslow and day. To our knowledge, there are no studies of long-term follow-up after screening colonoscopy to which our results can be compared directly [14]. However, there are several studies that have assessed the impact of colonoscopy and polypectomy on colorectal cancer incidence and mortality. The national polyp study reported that patients with adenomas who underwent colonoscopy polypectomy experienced a 76% reduction in colorectal cancer incidence compared with a seer reference population, and the incidence rate was 0.6 per 1000 person-years. European studies have reported comparable reductions in colorectal cancer incidence after colonoscopy with polypectomy. However, the polyp prevention trial and wheat-bran fibre trial have reported a higher risk of incident colorectal cancer after colonoscopy with polypectomy, ranging from 2.2 to 2.4 per 1000 person-years. The cis for the sir and standardized mortality rate were obtained by dividing the upper and lower 95% confidence limits of the observed number of cases by the expected number of cases.

Conclusion

The reasons for these conflicting results are not clear, but likely reflect differences in study methodology. Patients enrolled in the national polyp study underwent thorough colonoscopy clearing before randomization, and the procedures were performed by experts. Furthermore, patients with adenomas 3 cm or greater were excluded from the national polyp study, which was not the case in some of the other trials. In contrast with these post-polypectomy studies, Singh reported that the colorectal cancer incidence in a cohort with negative baseline colonoscopy was 1.1 per 1000 person-years.

Acknowledgement

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Conflict of Interest

None

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