Are Blind Patients at a Disadvantage with Current Colorectal Screening Strategies? A Pilot Survey

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Abstract

- *Objective:* To determine if blind patients have the same rates of colorectal cancer (CRC) screening as the average population and to compare their screening rates with those of a control group that may be at higher risk for CRC.
- *Methods:* We identified a patient cohort of blind patients (group 1) from a larger study on CRC screening among patients at a Veterans Administration Medical Center. An age-matched nonblind control cohort (group 2) was chosen from patients regularly monitored for Barrett's esophagus. A retrospective records review was conducted to document screening rates, modalities used, symptomatology, and the prevalence of CRC over a 9-year period (1996–2005).
- *Results:* Of 136 blind patients, 78 (57%) had some form of screening, and 58 had no documentation of CRC screening. In the nonblind group, the screening rate was 90%. There were no significant differences in age, type of screening test completed, CRC incidence (2.9% vs. 1.8%), or symptoms (17% vs. 20%) between the 2 groups.
- *Conclusions:* Blind patients appear to be at no disadvantage with CRC screening, achieving screening rates similar to historically reported U.S. norms. The ability to obtain higher screening rates in patients at potentially greater risk for CRC (group 2) suggests that better CRC screening rates are possible in all patients.

Approximately 9.7 million people in the United States are legally blind (best corrected central visual acuity ≤ 20/200 or a field of vision ≤ 20 degrees) or have low vision (visual acuity ≤ 20/40). This group includes patients who have no vision and those who have difficulty seeing even using corrective lenses. It is to be noted that the prevalence of visual disabilities is predicted to rise in the coming years, partly as a result of an aging population [1–4]. Unfortunately, blindness and low vision adversely affect health care quality. There are a number of reasons for this, including problems with access to care, lack of insurance as a consequence of the inability to work in a number of occupations, difficulties in obtaining instruction in accessible formats, and being unable to drive or use public transportation [1]. Colorectal cancer (CRC) is the second most common cause of cancer-related death in the United States [5–8]. Despite the fact that screening has been shown to reduce the rate of CRC-related death from early detection of premalignant polyps [9–11], rates of screening remain low [6,9,12]. Many reasons have been cited for these low rates, ranging from physician unawareness of current screening recommendations, low reimbursement rates, patient-related factors that include procedure embarrassment, low levels of education or health literacy, and other system-related barriers [6,9,13–16]. Moreover, the diagnosis of CRC may depend on the self-reporting of both symptoms and signs (visible blood in the stool). In addition, compliance with screening strategies such as use of fecal occult blood testing (FOBT) may place the legally blind at a disadvantage. This raises the question of whether current CRC screening methods yield comparable screening rates in the visually impaired population. With this question in mind, we conducted a retrospective review of a CRC screening program at a Veterans Administration Medical Center (VAMC).

Methods

Setting and Participants

We identified a group of legally blind veterans from patients participating in a larger study of CRC screening at the John D. Dingell VAMC in Detroit, Michigan. The larger study was on the value of adnab-9 monoclonal antibody as a means of screening for CRC and Barrett's esophagus. Patients in this study had to be 50 years of age or older and eligible for

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Table. Patient Characteristics

	Blind Group (*n* = 136)	Nonblind Group (*n* = 55)
Age, yr	69.1 ± 11.7	63.2 ± 10.14
Male, *n*	134	52
Female, *n*	2	3
African American, *n*	59	13
White, *n*	75	41
Hispanic, *n*	2	1
Colorectal cancer, *n*	4	1
Other cancer,* *n*	15	5
Screening, %	57	90
FOBT	55	65
ENDO	45	58
DCBE	12	5
FOBT and ENDO	26	34

There were no statistically significant differences between groups in age, colorectal cancers, other cancers, and screening test ordered. DCBE = double-contrast barium enema; ENDO = sigmoidoscopy or colonscopy; FOBT = fecal occult blood test.

*Lung, prostate, head, and neck cancer in patients who had screening for colorectal cancer.

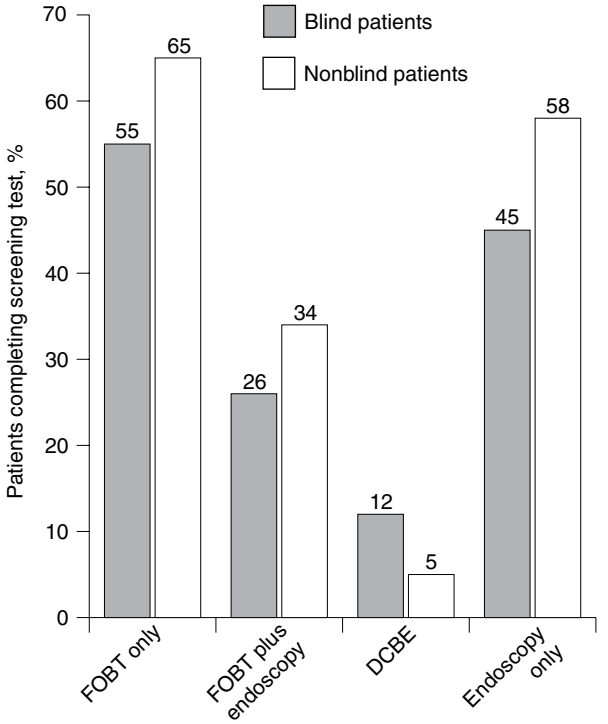

Figure. Screening test in blind and nonblind patients by modality. Endoscopy is colonoscopy or sigmoidoscopy. DCBE = double-contrast barium enema; FOBT = fecal occult blood test.

CRC screening. Patients with previous history of CRC were excluded. We compared screening rates in blind patients with rates in an age-matched control group of nonblind patients who were in the larger study and being monitored for Barrett's esophagus.

We reviewed patients' electronic records for the years 1994 through 2005 and recorded documentation of screening rates, modalities used, and prevalence of CRC. We used a data set extending over 5 years to cover the usual interval for most CRC screening modalities at our center.

A positive FOBT was defined as a blue color developing in any single window regardless of the number of cards returned. This is the standard at our center where the centralized pathology laboratory performs and documents the results of all FOBT, using Hemoccult II, Instaccult, or Starline guiac-impregnated FOBT cards. In addition to FOBT, CRC screening was defined as colonoscopy, flexible sigmoidoscopy, double-contrast barium enema (DCBE), and any other diagnostic procedure that led to a diagnosis of CRC.

Statistical analysis was by Fisher's exact test or parametric Students *t* test, with a probability value of $P < 0.05$ considered significant.

Results

Review of medical records identified 142 legally blind patients, 96% of whom had screening details available. Of this group of 136 (group 1), 78 (57%) had some form of colorectal cancer screening, and 58 (43%) had no documented colorectal screening. Group 2 comprised 55 age-matched controls with Barrett's esophagus who were not visually handicapped but who were at a higher risk for CRC. The overall screening rate for CRC in group 2 was 90% (**Table**). Patients were predominantly male, reflecting the patient population at the VAMC. In group 1 (blind patients), 55% completed FOBT, 45% had flexible sigmoidoscopy and/or colonoscopy (endoscopy), 26% had FOBT and endoscopy, and 12% had DCBE (Table and **Figure**). In group 2 (nonblind patients), some patients had combined FOBT, colonoscopy, and DCBE, but overall 65% had FOBT, 58% patients had endoscopy (colonoscopy or sigmoidoscopy), 34% had FOBT and endoscopy, and 5% had DCBE. A comparison of group 1 with group 2 showed no significant differences in age (69.1 ± 11.7 years vs. 63.2 ± 10.1 years), CRC diagnosed (4 vs. 1), or type of screening test offered and completed. A greater proportion of the control group patients (nonblind) tended to report symptoms of constipation and abdominal pain (20% vs. 17%) compared with group 1; however, this difference was not statistically significant. In group 1, DCBE was ordered more frequently as a form of screening (12% vs. 5%) compared with group 2. The prevalence of cancers

(lung, prostate, and head and neck) was similar in group 1 and group 2 ($P = 0.11$) (Table).

Discussion

The prevalence of visual impairment is high in the United States, and incidence is projected to increase as the population ages. Patients who are legally blind (< 20/200) appear less satisfied with their health care than others [17,18]. Our aim was to assess if legally blind patients are at a disadvantage in obtaining preventive health screening for CRC because of their inability to notice signs like blood in stool or secondary to other patient, provider, and system-related barriers. Current CRC screening recommendations in a population at average risk are to start screening at age 50 years. Of the screened patients in groups 1 and 2, a majority of patients who were offered FOBT completed the test, indicating high compliance once the test was offered. It emphasizes the fact that every effort should be made to offer FOBT as a CRC screening test, given an improvement in disease-specific survival [19].

The overall screening rate in group 2 was 90%, a reflection that higher screening rates are possible perhaps as a result of ambulatory screening plans being better defined. A PubMed and Ovid search of the terms "colon cancer," "visually impaired," and "legally blind" did not reveal any medical literature on cancer screening rates in legally blind patients. Therefore, this may be the first study assessing screening for CRC in this set of patients. It appears from our study that there is no impediment to performing FOBT in blind patients and that the rate of screening for CRC is equivalent to that of historically reported figures (< 60%) for the general U.S. population [20].

There are several limitations to our study. First, this was a retrospective analysis and we had to rely on previously recorded data. We could have missed legally blind patients not enrolled in the database as visually impaired. Second, our study sample was a relatively small data set and cannot be generalized to the population as a whole. Moreover, our group of blind patients were veterans, predominantly males, who may have had better health care access and as such may not reflect the population at large. In addition, our study did not look at the offering and acceptance rates of particular screening modalities in each group, as our aim was to look at the rate of preventive screening for CRC in blind patients. Finally, although it remains controversial whether or not Barrett's esophagus is associated with CRC, previous studies have shown increased risk of CRC in patients with Barrett's esophagus [21] and an association with development of colonic polyps [22].

In this clinical setting, the legally blind appear to be at no disadvantage as regards CRC screening. This pilot study suggests that with efficient primary health care processes, the objective of CRC screening can be achieved even in the legally blind patient population. It also emphasizes that screening rates can be substantially increased, as noted in the special cohort of patients monitored for Barrett's esophagus in the same institution. Several interventions have recently been shown to increase colorectal cancer screening rates. They include better understanding by patient and provider of the need for CRC cancer screening, the wider availability of screening colonoscopy, and the increased use of patient decision aids [23].

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References

1. O'Day BL, Killeen M, Iezzoni LI. Improving health care experience of persons who are blind or have low vision: suggestions from focus groups. Am J Med Qual 2004;19:193–200.
2. Iezzoni LI. Discharged blindly. Case and commentary. Morbidity and mortality rounds on the web (Dec 2005). Accessed 12 Oct 09 at www.webmm.ahrq.gov/case.aspx?caseID=111.
3. Congdon N, O'Colmain B, Klaver, et al. Causes and prevalence of visual impairment among adults in the United States. Arch Ophthalmol 2004;122:477–85.
4. Vision impairment. National Center on Birth Defects and Developmental Disabilities. Centers for Disease Control and Prevention. Accessed 14 May 09 at www.cdc.gov/ncbddd/dd/ddvi.htm.
5. Ransohoff DF, Sandler RS. Screening for colorectal cancer. N Engl J Med 2002;346:40–4.
6. Sonnenberg A, Delco F, Inadomi JM. Cost-effectiveness of colonoscopy in screening for colorectal cancer. Ann Intern Med 2000;133:573–84.
7. Greenlee RT, Hill-Harmon MB, Murray T, Thun M. Cancer statistics, 2001. CA Cancer J Clin 2001;51:15–36.
8. Seeff LC, Shapiro JA, Nadel MR. Are we doing enough to screen for colorectal cancer? Findings from the 1999 Behavioral Risk Factor Surveillence System. J Fam Prac 2002;51:761–6.
9. Mandel JS, Church TR, Bond JH, et al. The effect of fecal occult blood screening on the incidence of colorectal cancer. N Engl J Med 2000;343:1603–7.
10. Mandel JS, Bond JH, Church TR, et al. Reducing mortality from colorectal cancer by screening for fecal occult blood. N Engl J Med 1993;328:1365–71.
11. Selby JV, Friedman GD, Quesenberry CP Jr, Weiss NS. A case-control study of screening sigmoidoscopy and mortality from

colorectal cancer. N Engl J Med 1992;326:653–7.
12. Coughlin SS, Thomson TD. Colorectal cancer screening practices among men and women in rural and nonrural areas in the United States 1999. J Rural Health 2004;20:118–24.
13. Vernon SW. Participation in colorectal cancer screening: a review. J Natl Cancer Inst 1997;89:1406–22.
14. Subramanian S, Klosterman M, Amonkar MM, Hunt TL. Adherence with colorectal cancer screening guidelines: a review. Prev Med 2004;38:536–50.
15. McCarthy BD, Moskowitz MA. Screening flexible sigmoidoscopy: patient attitudes and compliance. J Gen Intern Med 1993; 8:120–5.
16. Lewis JD, Asch DA. Barriers to office-based screening sigmoidoscopy: does reimbursement cover costs? Ann Intern Med 1999;130:525–30.
17. Iezzoni LI, Davis RB, Soukup J, O'Day BL. Satisfaction with quality and access to health care among people with disabling conditions. Int J Qual Health Care 2002;14:369–81.
18. Iezzoni LI, Davis RB, Soukup J, O'Day BL. Quality dimensions that most concern people with physical and sensory disabilities. Arch Intern Med 2003;163:2085–92.
19. Mandel JS, Church TR, Ederer F, Bond JH. Colorectal cancer mortality. Effectiveness of biennial screening for fecal occult blood. J Natl Cancer Inst 1999;91:434–7.
20. MMWR. Use of colorectal cancer tests—United States, 2002, 2004, and 2006. MMWR Morb Mortal Wkly Rep 2008;57: 253–8.
21. Howden CW, Hornung CA. A systematic review of the association between Barrett's esophagus and colon neoplasms. Am J Gastroenterol 1995;90:1814–9.
22. Bollschweiler E, Schloesser T, Leers J, et al. High prevalence of colonic polyps in white males with esophageal adenocarcinoma. Dis Colon Rectum 2009;52:299–304.
23. Pignone MP, Lewis CL. Using quality improvement techniques to increase colon cancer screening. Am J Med 2009;122: 419–20.