Impact of an Educational Intervention on Abdominal Aortic Aneurysm Screening in a General Internal Medicine Clinic

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ABSTRACT

Objective: The US Preventive Services Task Force recommends 1-time screening for abdominal aortic aneurysm (AAA) by ultrasound in men aged 65 to 75 years who have ever smoked. We assessed screening rates in our general internal medicine clinics before and after a low-cost physician education intervention.

Methods: We conducted a chart review to assess our screening rate, then implemented an intervention consisting of education with a didactic component, emails, and an audit with feedback and discussion. We then reviewed charts to assess screening rates immediately post-intervention and 5 to 6 months following the intervention.

Results: Pre-intervention, 88 patients met the criteria for screening but only 6 (6.8%) underwent screening. Immediately following the intervention, 79 patients met the criteria and 14 (17.7%) underwent screening. The increase in AAA screening was significant ($P = 0.034$). Five to 6 months later, 89 patients met the criteria but only 8 (9.0%) underwent screening. The increase from pre-intervention was not significant ($P = 0.781$).

Conclusion: A simple, low-cost educational intervention to improve AAA screening was helpful. However, the effect was short-lived.

The incidence of abdominal aortic aneurysm (AAA) increases steadily with advancing age, and there is a 3- to 5-fold increase in prevalence in people who ever smoked. AAA occurs in approximately 1 in 20 older men who have ever smoked [1]. It remains a serious health problem, especially in Western nations, where it accounts for about 2% to 4% of all deaths in the male population [2]. AAA accounts for more than 13,000 deaths per year in the United States [1]. Despite advances in general surgical care, the overall mortality rate from a ruptured AAA can be as high as 80% to 90% [3]. Conversely, mortality rates are less than 5% for elective surgical repair, which is often curative [4]. Based on randomized population-based screening protocols, a single ultrasound examination reduces mortality from AAA by facilitating elective surgical intervention before rupture [5]. The relative risk of mortality from AAA decreases by 43% with screening [6]. In 2005, the US Preventive Services Task Force recommended 1-time screening for AAA by ultrasound in men aged 65 to 75 years who have ever smoked. Despite these recommendations, many patients do not receive appropriate screening for this condition [7].

The use of clinical practice guidelines has been proposed as a way of improving health care processes and outcomes [8–10]. However, large gaps have been observed between guideline recommendations and actual practice [11–13]. A number of guideline dissemination and implementation strategies have been evaluated with regard to which are likely to be effective under different circumstances [13–15]. Passive dissemination of a guideline is not likely to translate into changed practice behaviors, better health outcomes, or contained costs [8,15].

As a part of the residency competency at our academic center, a quality assessment and improvement project was conducted. We assessed the adherence of our general internal medicine clinics to the Task Force’s AAA screening guidelines and assessed the impact of a simple, low-cost physician education intervention on AAA screening rates. We also assessed the carry-over effectiveness 6 months after the physician education intervention.
METHODS
The Department of General Internal Medicine at the Southern Illinois University School of Medicine has 14 categorical residents in each year and 10 outpatient attending physicians. A resident has a continuity clinic 1 to 2 times per week and generally carries a panel of 100 to 200 patients. Continuity clinic for the intern class begins in September of each year and the senior class graduates in June of the following year. In order to keep the same physician population, the maximum feasible study period was 10 months: September through June of the following year.

We performed an analysis using data from our general internal medicine clinic to assess the quality of AAA screening as per the Task Force guidelines. First, we examined the electronic health record to review the visits of all men between 65 and 75 years of age during the 2-month period September through October 2009. Age and smoking status were recorded. Patients were excluded if they (1) never smoked or (2) previously underwent abdominal imaging, eg, ultrasound, computed tomography (CT), or magnetic resonance imaging (MRI) in the last 5 years that included the status of the abdominal aorta. A patient was considered “screened” if the physician documented the offer of screening or ordered AAA screening during that visit. For repeat visits during the study period by a patient who was not earlier “screened,” the patient was considered a new patient because the physician had a new opportunity to recommend screening during that visit. All efforts were also made to record the actual screening result.

We implemented an education intervention during the 2-month period November–December 2009. The intervention consisted of (1) a 15-minute didactic powerpoint presentation given to all the residents and faculty of general internal medicine regarding the AAA screening guidelines and the results of the pre-intervention period; (2) a 15-minute discussion during which questions were answered and practical suggestions about AAA screening implementation in our clinic were made; and (3) 2 emails sent to all residents and faculty of general internal medicine to educate and encourage the utilization of the AAA screening guidelines 2 weeks before and after the presentation.

A post-intervention analysis was performed during 2 separate periods: (1) immediately, during January and February 2010, and (2) 5 months later, between May and June 2010. Descriptive and nonparametric (Fisher’s exact test) statistics were computed using PASW 18 software (SPSS, Chicago). The project was approved by the institutional review board of the Springfield Committee for Research Involving Human Subjects.

RESULTS
In the pre-intervention period, 88 patients met the criteria for screening. Mean age was 69.6 years (SD ± 2.5). Only 6 (6.8%) underwent screening. In the immediate post-intervention period, 79 patients met the criteria for screening. Mean age of this group was 69.8 years (SD ± 2.5). Fourteen of these patients (17.7%) underwent screening. In the delayed post-intervention period, 89 patients met the criteria for screening. Mean age of this group was 69.8 years (SD ± 3.1), and only 8 (9.0%) underwent screening. Out of 28 screened patients across all groups, 2 cases (7.1%) of significant AAA (> 3 cm) were found [6].

The nonparametric Fisher’s exact test was applied to analyze the significance of change because the sample size was small, nonrandomized, and the value in at least 1 of the cells of a contingency table was less than 10, with only 1 degree of freedom [16]. The first analysis was performed between the pre-intervention and immediate post-intervention group. The 2-tailed and 1-tailed P values were 0.034 and 0.026 respectively, which were statistically significant for an AAA screening rate increase. The second analysis was performed between the pre-intervention and delayed post-intervention group. The 2-tailed and 1-tailed P values were 0.781 and 0.400 respectively, which were not significant.

DISCUSSION
Screening for AAA in men aged 65 to 75 years who have ever smoked has been shown to lower AAA mortality. It is also cost-effective, costing about $50 per patient screened [6,17]. In our general internal medicine clinics, we found the overall rates of AAA screening were low.

Other studies have looked at methods to improve AAA screening rates. In 2009, Federman et al reported in a retrospective analysis of 279 eligible veterans in Connecticut that only 30% were offered screening for AAA, but their result included patients who had a recent abdominal imaging like ultrasound, CT, or MRI for other purposes [7]. Later, after implementation of the electronic...
clinical reminder, the above group showed an increase in AAA screening to 56.4% [18]. Our findings were similar to Eaton et al, who reported that despite the use of physician reminders, providers ordered AAA screening for only 12.9% of eligible patients, which excluded all patients with previous abdominal imaging in the last 5 years [19]. The overall AAA detection rate in our study was 7.1%, which was consistent with previous reports of 5% to 7% of the eligible population [18,20,21].

The method we used to disseminate and encourage use of the Task Force guidelines was education through a didactic component, emails, and an audit with feedback/discussion. Our intervention was associated with an immediate increase in the AAA screening rate, but the improvement faded over a 6-month period.

A review by Davis and Taylor-Vaisey [12] examined variables affecting the adoption of guidelines. These included qualities of the guidelines, characteristics of the health care professional, social norms, ethics, regulations, characteristics of the practice setting, rewards or incentives, and patient factors. With regard to implementation of guidelines, different interventions have been shown to be more or less effective. For example, didactic, traditional continuing medical education and mailings are considered weak; audit and feedback, especially concurrent, targeted to specific providers and delivered by peers or opinion leaders is moderately effective; and reminder systems, academic detailing, and multiple interventions are relatively strong [12,22–24]. A recent review by Prior et al [22] identified the following as effective: multifaceted interventions, educational outreach, educational meetings and interactive educational interventions, clinical reminder and decision support systems, patient-specific interventions, and the production of practical guidelines of low complexity.

There are several limitations of the present study. First was the retrospective design with small sample size. Second, our method to identify patients who were screened likely underestimated true screening behavior because we excluded all the patients with prior abdominal imaging. Third, the providers in this study included residents at different levels of training and attending physicians. We did not classify screening rates according to provider type. Despite these weaknesses, this study showed that a low-cost and simple educational intervention aimed at increasing the awareness of AAA screening guidelines increased the rate of screening at our general internal medicine clinics. However, the effect was short-lived, likely due to lack of continued point-of-care education. We suggest that incorporating guidelines for AAA screening into the continuing education curriculum for primary care physicians may be helpful in increasing the rate of screening. Point-of-care education of physicians and reminders may further help sustain this improvement [18,19,21].

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REFERENCES


11. Lomas J. Words without action? The production, dissemination,