One-Time Ultrasound Screening for Abdominal Aortic Aneurysm: Potential Benefits for Up to 15 Years

Ashton HA, Gao L, Kim LG, et al. Fifteen-year follow-up of a randomized clinical trial of ultrasonographic screening for abdominal aortic aneurysms. Br J Surg 2007;94:696–701.

Study Overview

Objective. To determine the impact of ultrasonographic screening for abdominal aortic aneurysms (AAAs) on aneurysm-related mortality.

Design. Randomized controlled trial.

Setting and participants. Men aged 65 to 80 years were recruited from 9 general practices in Chichester, United Kingdom.

Intervention. Participants underwent a single screening ultrasound for AAA or received standard care. Aortic diameter was measured in the longitudinal and transverse planes. Participants with aneurysmal dilations of 4.5 to 5.9 cm were offered screening every 3 months, and those with an aortic diameter of 3.0 to 4.4 cm were offered annual screening. Participants with an aortic diameter of ≥ 6.0 cm were referred to a vascular surgeon for consideration of surgery.

Main outcome measures. AAA-related death and incidence of AAA rupture.

Main results. Of 6040 participants, 3045 were randomized to standard care, and 2995 patients were allocated to screening. 779 participants in the intervention group refused to undergo screening. 170 men (7.7%) were diagnosed with an AAA based on the screening examination. In the control arm, the rate of AAA-related deaths per 1000 person-years of follow-up was 1.80 (95% confidence interval [CI], 1.38–2.35) compared with a rate of 1.60 (95% CI, 1.20–2.12) in the screening group, resulting in an 11% reduction in AAA mortality (hazard ratio [HR], 0.89 [95% CI, 0.60–1.32]). The total incidence of ruptured AAA per 1000 person-years was 2.10 (95% CI, 1.64–2.69) in the control group and 1.83 (95% CI, 1.40–2.40) in the screening group (HR, 0.88 [95% CI, 0.61–1.26]). There was no difference in total deaths from any cause between the groups (HR, 1.01 [95% CI, 0.95–1.07]).

Conclusion. One-time ultrasonographic screening for AAAs in men > 65 years may reduce aneurysm-related mortality for up to 15 years.

Commentary

Ruptured AAAs are a devastating but potentially preventable cause of mortality in the United States. Abdominal ultrasonography is a noninvasive, highly sensitive and specific method for detecting occult AAA. Despite the availability of an accurate screening modality for this lethal disease, recommendations for routine population-based screening for AAA has been hindered by 2 major issues. First, AAAs are relatively rare and many small aneurysms never progress into larger, more dangerous ones. Second, open surgical correction is associated with a significant operative and 30-day postoperative mortality rate, primarily because patients with large AAA typically have other comorbid conditions and are already at high surgical risk. Subsequently, these patients often die from non–AAA-related causes. These 2 barriers, however, are being largely addressed. With respect to surgical procedures, newer techniques (eg, use of intravascular stents) offer a potential means for reducing rupture risk as well as operative morbidity and mortality rates [1]. Additionally, there are several well-established risk factors for AAA, such as male gender, age, and smoking status, which have enabled the identification of populations who might benefit most from AAA screening.

This study by Ashton et al presents the 15-year follow-up of a randomized controlled trial and further lends support to routine screening for AAA in high-risk individuals. Earlier reports from this study noted significant AAA-related mortality reductions at 5 and 10 years (42% and 21%, respectively) [2,3], and this trend continued with an 11% reduction at 15 years. These results were not statistically significant, as the smaller sample size resulted in wide CIs. Nevertheless, the results are consistent with the previous reports of an immediate benefit that starts to wane over time. This study, as with the earlier reports, noted no difference in all-cause mortality. A study of women demonstrated no difference in AAA-related mortality or all-cause mortality between the screening and regular care group, and this is likely secondary to the low incidence of AAA in women [4]. Recently, the U.S. Preventive Services Task Force recommended a single ultrasound screening in men aged 65 to 75 years who have ever smoked [5]; this study by Ashton et al supports these recommendations.

Applications for Clinical Practice

One-time screening for AAA in men aged 65 to 75 years is likely to have long-term benefit on AAA-related mortality for up to 15 years. Providers should include AAA screening along with other health maintenance examinations for older men with a smoking history.

—Review by Harvey J. Murff, MD, MPH

References

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