Routine Screening for Abdominal Aortic Aneurysms: Is it for everyone?

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INTRODUCTION

Abdominal aortic aneurysm (AAA) is a weakening of the walls of the aorta causing an enlargement of the artery. AAA’s are typically asymptomatic unless they rupture, an often fatal complication. However, according to the CDC, aortic aneurysms were the primary cause of approximately 11,000 deaths in 2009. Risk factors associated with AAA include: male gender, age > 65, hypertension, hypercholesterolemia, atherosclerosis and smoking. Tobacco use is the most significant modifiable risk, increasing the likelihood of AAA 3 to 5 fold (Fleming) As of 2005, the US Preventative Services Task Force (USPSTF) recommends a “1-time screening for AAA with ultrasonography in men aged 65 to 75 years who have ever smoked”. The USPSTF gives a grade C recommendation that health care providers use clinical judgment to offer AAA screening in 65 to 75 year old male nonsmokers with other known risk factors.

METHODS

Sources: PubMed and references from USPSTF recommendations on AAA screening

Key words: screening, abdominal aortic aneurysm, reduce, and mortality.

Inclusion criteria: Males over 65, 65 years old, smoked

RESULTS

Study #1: Norman et al

Study Design:
- RCT
- Western Australia
- Participants selected from the voting registry
- Inclusion criteria consisted of men ages 65-79 but excluding those with previous scans or operations for AAA, too sick to participate or declined.
- 4,100 men invited to participate. Half were randomly placed in the control and half in the intervention (screened) group. Only 12,203 scans were actually obtained
- 5 year follow up was obtained via death and hospital admission records.

Results: Incidence of AAA: 7.2% Absolute Risk Reduction (ARR): 0.07%

Validity/Critique:
- Large sample size
- No control over medical consultations or interventions following the screening
- Even “ineligible men” were included
- Projected p-value does not match conclusive study recommendation

Study #2: Ashton et al

Study Design:
- RCT
- United Kingdom
- Participants were selected from four different family medical centers
- Inclusion criteria of men ages 65-74. Exclusion criteria included the terminally ill
- 3,383 men were randomly assigned to the control group and 3396 to the intervention group. Only 27,147 men were actually scanned.
- Men with abnormal results were rescanned and followed over the course of 5 years.

Results: Incidence of AAA: 4.9% ARR: 0.14% NNS: 709

Validity/Critique:
- Applicable inclusion/exclusion criteria
- Questionable death certificate accuracy
- Mortality follow-up of 99%

Study #3: Scott et al

Study Design:
- RCT
- Chichester county in the UK
- Participants were selected from all general practice registers or from Family Health Service lists
- 15,777 people between the ages of 65 and 80 participated, 6433 of were male. Participants were randomly equally divided into control and screening group. 2,342 males accepted screening for AAA by ultrasound.
- The outcomes analyzed were AAA related mortality of the screened group compared with the control group at 1 year follow-up.

Results: Incidence of AAA: 7.6% ARR: 0.21% NNS: 466

Validity/Critique:
- The control group was treated differently than the study group; bias
- No reported p-value/statistical significance, lacking statistical analysis
- Outdated

CONCLUSIONS

Summary of study results

<table>
<thead>
<tr>
<th>Source</th>
<th>Incidence of AAA</th>
<th>Absolute Risk Reduction</th>
<th>Number Needed to Screen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norman et al</td>
<td>7.2%</td>
<td>0.07%</td>
<td>1393</td>
</tr>
<tr>
<td>Ashton et al</td>
<td>4.9%</td>
<td>0.14%</td>
<td>709</td>
</tr>
<tr>
<td>Scott et al</td>
<td>7.6%</td>
<td>0.21%</td>
<td>466</td>
</tr>
</tbody>
</table>

These studies clearly demonstrate a decrease in AAA-related mortality when routinely screening men greater than 65 years by ultrasound for AAA. Less clear is the benefit of routine screening as compared to the cost of such screenings.

While estimates of number needed to screen vary between studies, all studies conclude that, in order to save a life, fewer than 1,500 males older than 65 must be screened at least once in their lifetime. For comparison, the number needed to screen for colorectal cancer is 1250 people.

Unfortunately, almost all studies address both the efficacy and the cost of routine AAA ultrasound screening are outdated. Though pricing has undoubtedly changed since the time of the study, Vazquez estimates the cost of AAA ultrasound screening to be $551 each. At that price, the cost per life saved ranges between $256,766 and $767,543. For comparison, colonoscopy costs $852,737.50 per life saved.

ACKNOWLEDGEMENTS

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REFERENCES

3. Vazquez A. Aneurisms of the aorta causing an enlargement of the artery. AAA’s are typically asymptomatic unless they rupture, an often fatal complication. However, according to the CDC, aortic aneurysms were the primary cause of approximately 11,000 deaths in 2009. Risk factors associated with AAA include: male gender, age > 65, hypertension, hypercholesterolemia, atherosclerosis and smoking. Tobacco use is the most significant modifiable risk, increasing the likelihood of AAA 3 to 5 fold (Fleming) As of 2005, the US Preventative Services Task Force (USPSTF) recommends a “1-time screening for AAA with ultrasonography in men aged 65 to 75 years who have ever smoked”.
1 Define abbreviations when first used.
   Erika, 12/31/2015

2 Define abbreviations when first used. (And shouldn't this be "number needed to screen (NNS)"?)
   Erika, 12/31/2015

3 Over what time period(s)?
   Erika, 12/31/2015