

Screening for Abdominal Aortic Aneurysm

SBU ALERT REPORT NO 2008-04 • 2008-09-17 • WWW.SBU.SE/ALERT



Summary and Conclusions

THIS DOCUMENT UPDATES A REPORT PUBLISHED DECEMBER 17, 2003.

SBU's appraisal of the evidence

Aneurysm of the abdominal aorta is common in older men. An aortic diameter of 30 millimeters, or more, is defined as an abdominal aortic aneurysm. As an aneurysm becomes larger the risk for rupture increases, often with fatal consequences. Screening to detect the condition at an early stage is one approach toward reducing mortality from abdominal aortic aneurysm.

- Screening for abdominal aortic aneurysm leads to reduced mortality related to abdominal aortic aneurysm in men (Evidence Grade 1)*. The method is cost-effective (Evidence Grade 1)*.
- Scientific evidence is insufficient* as regards the effects of screening for abdominal aortic aneurysm in women.
- Screening for abdominal aortic aneurysm is ethically defensible, provided that the screening programs are designed to satisfy fundamental ethical principles and that the information given in conjunction with the initial examination and followup is objective and easily understood.

*Criteria for Evidence Grading SBU's Conclusions

Evidence Grade 1 – Strong Scientific Evidence. The conclusion is corroborated by at least two independent studies with high quality, or a good systematic overview.

Evidence Grade 2 – Moderately Strong Scientific Evidence. The conclusion is corroborated by one study with high quality, and at least two studies with medium quality.

Evidence Grade 3 – Limited Scientific Evidence. The conclusion is corroborated by at least two studies with medium quality.

Insufficient Scientific Evidence – No conclusions can be drawn when there are not any studies that meet the criteria for quality.

Contradictory Scientific Evidence – No conclusions can be drawn when there are studies with the same quality whose findings contradict each other.

TECHNOLOGY AND TARGET GROUP Annually, around 600 men and just over 200 women in Sweden die as a result of rupture of an abdominal aortic aneurysm. Aneurysm is detected either through ultrasound or computed tomography (CT) examination of the abdomen, or after the aneurysm has ruptured. Aneurysms can be repaired surgically for preventive purposes. Surgery of this type is associated with a mortality risk probably below 3%.

Since the condition is less prevalent in women, discussions concerning screening have centered primarily on men. However, studies are under way to assess the effects of screening aimed at women. Screening of all men at 65 years of age is the recommended approach. A screening model of this type, covering all of Sweden, would invite approximately 50 000 men per year for examination. Results from studies in other countries show that approximately 75% of those invited actually participate in the screening program. However, experiences from current screening programs in Uppsala and Östergötland county councils suggest that participation could be higher in Sweden.

It has been estimated that approximately 5% of those examined have an abdominal aortic aneurysm. Of these, approximately 1 in 10 have an aortic diameter that is sufficiently large to motivate direct surgical intervention, while the others can be followed by regularly recurring examinations.

PRIMARY QUESTIONS

- Can screening reduce the risk for mortality from abdominal aortic aneurysm?
- Is screening for abdominal aortic aneurysm a cost-effective strategy?
- Is screening for abdominal aortic aneurysm ethically defensible?

PATIENT BENEFIT A meta-analysis showed that mortality from abdominal aortic aneurysm was lower among those randomized to screening. The analysis included

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3 controlled studies that, in all, involved approximately 125 000 individuals aged 65 to 83 years in screening programs.

The largest study, the MASS study, was conducted in England. It included 67 800 men aged 65 to 74 years. After 4 years of followup, mortality from abdominal aortic aneurysm was 42% lower in the study group than in the control group. The absolute risk was 0.19% and 0.33% respectively. Hence, to avoid a single death from aneurysm, approximately 700 men would need to undergo a screening examination. The two remaining studies showed similar results. After 7 years of followup, the MASS study showed that also total mortality was lower in the screened group.

ECONOMIC ASPECTS Introducing screening for abdominal aortic aneurysm involves costs related to the screening examination itself, which is usually performed with ultrasound. Further costs would be incurred from the greater number of preventive operations. Concurrently, however, the costs for acute operations would decrease.

An analysis based on data from the MASS study showed that after 7 years of followup the cost per life-year saved was 19 500 US dollars (USD), corresponding to approximately 117 000 Swedish kronor (SEK). Model studies have analyzed the cost-effectiveness of a screening program that is limited to 65-year-old men, showing a somewhat lower cost per life-year saved.

ETHICAL ASPECTS Actively searching for a condition in a symptom-free population – where the treatment offered is associated with a mortality risk up to 3% and some postsurgical morbidity – is ethically controversial. Even if screening leads to an overall reduction in the number of deaths, the treatment itself will lead to premature death in some patients. Not implementing a screening program that is apparently effective and can be delivered at a reasonable cost may, however, also be ethically controversial. Some have claimed that screening for abdominal aortic aneurysm is ethically called for, providing that certain conditions are met, eg, that screening does not crowd out other more urgent needs.

In certain cases, screening detects aneurysms that are too small to motivate preventive surgery. The knowledge that one has an aneurysm, but that it will not be treated until it grows larger, could be a psychological burden.

Hence, prior to examination and possible treatment, it is important for participants in the screening program to receive information that clarifies the issues in an objective and easily understood manner. Also, participants should be given an opportunity to weigh different options in consultation with their attending physicians, family members, and others.

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The complete report is available only in Swedish.