

Effect of abdominal aortic aneurysm screening

This is an excerpt from the full technical report, which is written in Norwegian.

The excerpt provides the report's main messages in English.

No. 6-2014

Health Technology Assessment (HTA)

Title Effect of abdominal aortic aneurysm screening
Norwegian title Effekt av abdominalt aortaaneurismescreening
Institution Norwegian Knowledge Centre for the Health Services
(Nasjonalt kunnskapssenter for helsetjenesten)
Magne Nylenna, *Director*
Authors Frønsdal, Katrine B, *Project Leader, Senior Researcher*
Sæterdal, Ingvil, *Project Collaborator, Senior Researcher*
Harboe, Ingrid, *Research Librarian*
Klemp, Marianne, *Research Director*
Fure, Brynjar, *Research Director*

ISBN 978-82-8121-854-3
ISSN 1890-1298
Report No. 6 – 2014
Project number 925
Type of report Health Technology Assessment (HTA)
No. of pages 49 (124 including appendices)
Client The National Council for Priority Setting in Health Care in Norway
Subject heading (MeSH) Aortic Aneurysm, Abdominal. Mass Screening
Citation Frønsdal KB, Sæterdal I, Harboe I, Klemp M, Fure B. Effect of abdominal aortic screening. Report from Kunnskapssenteret no. 6–2014. Oslo: Norwegian Knowledge Centre for the Health Services, 2014.

Norwegian Knowledge Centre for the Health Services summarizes and disseminates evidence concerning the effect of treatments, methods, and interventions in health services, in addition to monitoring health service quality. Our goal is to support good decision making in order to provide patients in Norway with the best possible care. The Centre is organized under The Norwegian Directorate for Health, but is scientifically and professionally independent. The Centre has no authority to develop health policy or responsibility to implement policies.

We would like to thank all contributors for their expertise in this project. Norwegian Knowledge Centre for the Health Services assumes final responsibility for the content of this report.

Norwegian Knowledge Centre for the Health Services
Oslo, March 2014

Key messages

Abdominal aortic aneurysm (AAA) is a dilatation of the abdominal aortic artery. AAA rupture is a dramatic, lethal emergency condition with a high risk of death, even with treatment. The larger the dilation, the higher is the risk of rupture. Screening programs for AAA are used to identify aneurysms and individuals potentially at a high risk of AAA rupture or AAAs so-called suitable for repair. Those identified as suitable for repair, usually by ultrasound scan, are offered preventive (elective) surgery to reduce their individual risk of rupture. In Norway, the number of operations (urgent and elective) is approximately 800 per year.

The European Network for Health Technology Assessment (EUnetHTA) produces collaborative health technology assessments (HTAs) intended to be used by all countries to avoid duplication and waste of resources. The Norwegian Knowledge Centre for the Health Services (NOKC) has taken advantage of the HTA from EUnetHTA on the effect of AAA-screening published January 2013 to produce this systematic review. In terms of clinical effectiveness and safety, main conclusions are:

- Evidence shows no reduction in overall mortality, neither in men nor in women, resulting from AAA screening (moderate quality of evidence).
- AAA screening can however be beneficial in men over 65 years of age, as it can reduce AAA-related mortality by nearly half in the mid- and long-term (low to moderate quality of evidence).
- In women aged 65 years and more, however, data indicate no change in AAA-related mortality (very low quality of evidence).
- Safety of AAA screening is mainly related to the subsequent surgical intervention that follows detection of an AAA with high risk of rupture (eligible for repair).
- Hospital volume, surgeon volume, and surgeon's specialization in vascular surgery are factors associated with mortality when an AAA is eligible for repair.

Title:

Effect of abdominal aortic aneurysm screening

Type of publication:

Health technology assessment (HTA) is a multidisciplinary process that summarizes information about the medical, social, economic and ethical issues related to the use of a health technology in a systematic, transparent, unbiased, robust manner. Its aim is to inform the development of safe, effective health policies that are patient focused and that seek to achieve best value.

Doesn't answer everything:

- Excludes studies that fall outside of the inclusion criteria
- No recommendations

Publisher:

Norwegian Knowledge Centre for the Health Services (NOKC)

Peer review:

Kirsten Krogh Sørensen og Anne Karin Lindahl

Executive summary

Background

Abdominal aortic aneurysm (AAA) is a dilatation of the abdominal aortic artery. AAA rupture is a dramatic, lethal emergency condition with a high risk of death even when treated, and the risk of rupture increases with the diameter of the dilatation. 1–2% of all deaths in the Western world are estimated to be caused by AAA ruptures. Although it varies across European countries, the percentage of men at high risk of AAA has been increasing steadily over the last 20 years. Screening programs to identify aneurysms and potential individuals at a high risk of AAA rupture have thus been considered as a potentially useful healthcare intervention in European countries, even if in most countries, including Norway, no systematic nationwide screening program has yet been implemented. Those individuals identified, usually through ultrasound scan examination, are offered preventive surgery (open or endovascular) to reduce the negative consequences of a spontaneous rupture if the aneurysm is large enough, or optimal medical treatment and follow-up if the aneurysm is less than the surgical treatment threshold (usually 50-55 mm).

Objective

In light of the increased interest in AAA screening in Norway (approximately 800 patients are operated per year in our country) and elsewhere, this report aims at assessing clinical effectiveness and safety of AAA screening using results from a HTA report carried out 2010-2012 by the European network for Health Technology Assessment (EUnetHTA).

Method

To produce the European HTA on the effect of AAA screening, the HTA Core Model[®] tool developed by EUnetHTA was used. The idea behind EUnetHTA's Core Model is to provide a framework for structuring relevant HTA information while at the same time facilitating use and adaptation of the information in different countries and settings. The Model is based on nine domains of evaluation: 1) Health problem and current use of the technology, 2) Description and technical characteristics of technology, 3) Clinical effectiveness, 4) Safety, 5) Costs and economic evaluation, 6) Eth-

ical analysis, 7) Organizational aspects, 8) Social aspects, and 9) Legal aspects. In this report, we have used all results from domains 3) and 4), while we have extracted the most relevant information from domains 1) and 2) for the background chapter.

In the common European HTA, a basic literature search was carried out for all domains (including the assessment of clinical effectiveness and safety used in this report). Additional searches were necessary for assessing safety. Criteria for inclusion of the population were all men and women aged 64 or more. The intervention was population-based systematic AAA screening, meaning detection of AAA in unruptured phase in order to treat those aneurysms with high risk of rupture (through one single invitation for the whole target population to do one ultrasound scan examination). The comparison was no population-based AAA screening which included incidental detection of AAA without age or sex limitation while performing abdominal ultrasound examinations due to other/unclear clinical indications and various opportunistic AAA-screening practices. Selection of literature was done according to these pre-defined inclusion criteria, and when appropriate, quality of evidence for the different outcomes was assessed using the GRADE instrument.

Results

Clinical effectiveness

Screening for AAA can result in a reduction of AAA-related mortality both in the long term (after 7 to 15 years) and in shorter term (after 3.5 to 5 years) in men, as evidence shows an approximately 50% significant reduction (low to moderate quality of evidence), whereas there appears to be no change in women. The evidence, however, does not support a reduction in long-term or shorter term overall mortality as a result of AAA screening neither in men nor in women. In terms of progression of the condition, evidence indicates that AAA screening possibly can reduce the incidence of ruptured AAA in men, but this does not seem to apply for women. For outcomes related to quality of life and patient satisfaction, evidence supports a possible reduction in anxiety and depression in AAA-screened individuals, but no change in quality of life. However, acceptance rates indicate that overall, patients are willing to be screened for AAA as evidence shows that acceptance of invitations to be screened is highest in men (81%) and women (73%) aged 65, and decreases with increasing age. Regarding outcomes related to change in management, there is no evidence on how use of the test may change physicians' management decisions or whether AAA screening detects other potential health conditions that may impact subsequent management decisions. However, AAA screening may modify the need for other technologies and resources in terms of planned and emergency operations as evidence shows that AAA-screened men both in the long-term (7 to 15 years) and in the medium term (3.5 to 5 years) have around 50% more planned operations and correspondingly fewer emergency operations than non-screened men (low quality of evidence). Intra- and inter-observer variation in ultrasound aorta diameter measure-

ments is the only outcome related to accuracy that has been assessed in the included literature, which indicates overall acceptable intra-observer repeatability and acceptable inter-observer reproducibility. However, the evidence is hampered by the fact that primary reliability and agreement studies cannot be assessed systematically across studies with regard to their quality. In addition, there are large variations in settings, examiner qualifications and training, sonography equipment and statistical analyses. Hence, the evidence does not allow any definite conclusions to be drawn regarding the importance of experience or background discipline.

Safety

AAA screening programs can cause harm to the screened subjects due to the expected increase in number of detected AAAs (increased incidence) and consequently the increased number of operations (subsequent surgical interventions that follow detection of AAAs with high risk of rupture) with potential risks for the patients. This is the main issue related to safety of AAA-screening. Hospital volume, surgeon volume, and surgeon's specialization in vascular surgery are associated with mortality when an AAA is detected and repaired. There may also be psychological consequences, as for instance anxiety related to detection of an AAA. In addition, unnecessary stress may be engendered by false-positive findings using AAA screening, but literature is scarce.

Discussion

While there is evidence for a benefit of AAA screening regarding clinical effectiveness, the evidence material on safety issues is poor. We should, however, bear in mind the importance of age, gender, preoperative morbidity, smoking and aneurysm size. These are relevant risk factors that may affect the outcome of surgical interventions following detection of an AAA suitable for repair (i.e. with high risk of rupture), hence the final outcome of an AAA screening program. In addition, detection of AAA would consequently lead to improved secondary prophylactic treatment of vascular risk factors, and thus reduce the risk of further enlargement of the AAA.

Conclusion

Evidence from the literature indicates that AAA screening can be beneficial in men over 65 years of age, as it can reduce AAA-related mortality by nearly 50% in the mid- and long-term. However, this is not likely to be the case in women, but here the evidence is poor. In terms of overall mortality, AAA-screening does not seem to have any effect neither in men nor in women. Moreover, AAA screening may result in a decrease of emergency operations for ruptured AAA, and an increase in elective AAA surgery. In terms of safety, serious harms are mainly related to the surgical intervention following detection of an AAA eligible for repair.