Screening for abdominal aortic aneurysm among patients referred to the vascular laboratory is cost-effective

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
This study examined the cost-effectiveness of screening for abdominal aortic aneurysms in high-risk patients referred to the vascular laboratory for arterial examination. The authors concluded that selective screening for aneurysms in patients with suspected arterial disease was cost-effective compared with no screening. There were some methodological limitations that might affect the validity of the authors' conclusions and further studies are needed to confirm these findings.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
This study examined the cost-effectiveness of screening for abdominal aortic aneurysm (AAA) in high-risk individuals who had been referred to the vascular laboratory for arterial examination.

Interventions
AAA screening, using arterial duplex examination, was compared with no screening.

Location/setting
Sweden/laboratory.

Methods
Analytical approach:
The analysis was based on a published Markov model with a lifetime horizon. The authors did not explicitly state the perspective adopted.

Effectiveness data:
The clinical evidence was from a literature review and a retrospective review of the records of 181 patients, who were referred to the vascular laboratory at a Swedish University Hospital between 1993 and 2005. This review provided the data for AAA-related outcomes and they were matched to survival data from national statistics. The mortality associated with a ruptured AAA appears to have been the key input.

Monetary benefit and utility valuations:
The utility values were derived from a study that reported quality-of-life estimates from the Swedish general population, measured using the European Quality of life (EQ-5D) questionnaire.

Measure of benefit:
Life-years (LYs) were the summary benefit measure and they were discounted at an annual rate of 3%. Quality-adjusted life-years (QALYs) were also reported as a secondary benefit measure.

Cost data:
The economic analysis included the costs of screening, follow-up after screening, surgery for non-ruptured and ruptured AAAs, and follow-up after surgery. The costs and quantities were from published sources and from the retrospective review of AAA screening at the Swedish hospital. All costs were in Euros (EUR) and the price year was 2006. A 3%
annual discount rate was applied.

Analysis of uncertainty:
A deterministic one-way sensitivity analysis was undertaken on the model parameters, which were varied using ranges based on the literature review and the retrospective record review. Two scenarios for the reduction in quality of life associated with an AAA were considered; a reduction of 25% for the whole population, and a reduction of 10% for patients with a known unrepaired aneurysm.

Results
In the base case, the incremental cost with screening over no screening was EUR 101.53 and the gain in LYs was 0.0092, resulting in an incremental cost per LY gained of EUR 11,084. The incremental cost per QALY gained was EUR 14,762. The cost-effectiveness ratio rose to EUR 19,683 per QALY gained, when assuming a 25% reduction in quality of life for the whole population. No screening was dominant, as it was more effective and less expensive, when assuming a 10% reduction in quality of life for patients with a known unrepaired aneurysm.

The cost-effectiveness ratio generally remained well below the threshold of EUR 50,000 per LY gained, in most of the plausible scenarios considered in the sensitivity analysis. It exceeded this threshold in two cases: when assuming a very high rupture rate in the screened population; and when assuming a lower utility for patients with a known aneurysm.

Authors’ conclusions
The authors concluded that selective screening for an AAA, in patients referred to the vascular laboratory with suspected arterial disease, was cost-effective compared with no screening.

CRD commentary
Interventions:
No screening was a valid comparator as it was the usual care for this patient population and a relevant alternative to the intervention.

Effectiveness/benefits:
The sources for the clinical inputs were limited. A retrospective review of patients’ charts is generally considered to be a weak data source, because it is open to bias that might affect the validity of the data. The literature review was not described, and neither were the methods of the selected sources. This means it is not possible to fully assess the validity of the analysis. LYs and QALYs were both valid and appropriate benefit measures and they capture the impact of the interventions on a patient's survival and quality of life. Some key information on the approach used to derive the utility values was provided. No data were available for patients with an AAA and utility weights from the general population were used. Alternative assumptions for the quality of life decrements were considered in the sensitivity analysis.

Costs:
The economic viewpoint was not explicitly stated. The costs were reported as category totals, and the unit costs and resource quantities were not given, which limits the transparency and external validity of the analysis. The data sources were not describe, but the price year and the discount rate were clearly reported. The key economic inputs were treated deterministically, but were varied in the sensitivity analysis.

Analysis and results:
The results were selectively presented, as only the additional costs and LYs were reported and the expected QALYs were not given. The issue of uncertainty was only partly considered, as the model inputs were varied one at a time. A description of the patients included in the clinical analysis was given and they seem to have been representative of high-risk patients referred to a vascular laboratory. The authors compared their results with those of a few other published studies, which also generally favoured selective screening. The results were highly sensitive to the utility weight assumptions.

Concluding remarks:
There were some methodological limitations that might affect the validity of the authors’ conclusions and further
studies are needed to confirm these findings.

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