Elective abdominal aortic aneurysm repair in the very elderly: a systematic review
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CRD summary
This review found that there were no differences in perioperative survival between open and endovascular repair of abdominal aortic aneurysm in people aged over 80, but that a larger number of major perioperative complications were observed after open repair. These results should be treated with caution given limitations in the conduct and analysis of the review.

Authors' objectives
To assess the early mortality, complication rates and long-term survival of elderly people after elective open or endovascular abdominal aortic aneurysm repair.

Searching
EMBASE (from 1988), Cochrane Library and MEDLINE (from 1975) were searched for articles published up to May 2008. Search terms were reported. Relevant medical journals (unspecified) were handsearched. No language restrictions were applied.

Study selection
All studies that reported postoperative mortality rates, or long-term survival rates, or both, in people aged 80 years or older, who underwent elective endovascular or open abdominal aortic aneurysm repair, were included in the review. Case reports, abstracts, unpublished data and studies on ruptured abdominal aortic aneurysms alone were excluded.

Across the included studies mean age ranged from 82 to 85 years, and the percentage of males was between 61% and 94%, where reported. The mean aneurysm size ranged from greater than 4.5cm to 8.2cm.

The authors did not state how the studies were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The methodological quality of the studies was assessed in terms of selection bias and completeness of follow-up.

The authors did not state how many reviewers performed the validity assessment.

Data extraction
Due to lack of uniformity in definitions and reporting, perioperative mortality was defined as the pooled 30 day and in-hospital mortality. Where two or more studies from the same institution were identified, the larger or better quality study was used unless different relevant outcomes were reported in the two papers. Where studies reported on long-term outcome of a previously reported patient cohort, the results from the two studies were combined.

The authors did not state how many reviewers performed the data extraction.

Methods of synthesis
For each treatment group, mortality was calculated as the sum of all deaths divided by the total sample size. Total numbers of deaths and major systemic complications were calculated for the perioperative period for open abdominal aortic aneurysm repair studies and for endovascular abdominal aortic aneurysm repair studies as separate analyses. Outcomes were compared using the odds ratio (OR) and 95% confidence intervals (CIs).

Results of the review
Thirty-five studies on open abdominal aortic aneurysm repair, five studies on endovascular abdominal aortic aneurysm repair, and four studies on both, were included in the review (n=2,966 patients). Study designs were not reported in...
detail, but the authors stated that almost all were single institutional series and retrospective in nature.

Open abdominal aortic aneurysm repair studies had a median sample size of 31 patients (range 6 to 246), whilst endovascular abdominal aortic aneurysm repair studies had a median sample size of 50 (range 16 to 697). Ninety percent of the open abdominal aortic aneurysm repair studies and 78% of the endovascular abdominal aortic aneurysm repair studies were susceptible to selection bias.

Across the open abdominal aortic aneurysm repair studies (n=1,807 patients), the perioperative mortality rate varied from 0 to 33% and the overall mortality rate was 5.6% (95% CI 4.5 to 6.7). The median five-year survival rate was 60% (range 14 to 86%).

Across the endovascular abdominal aortic aneurysm repair studies (n=1,159 patients), perioperative mortality varied from 0 to 6% and the overall mortality rate was 4.5% (95% CI 3.3 to 5.7). The median five-year survival rate could not be calculated, as only one study provided this length of follow-up.

Perioperative death was not statistically significantly different between endovascular and open abdominal aortic aneurysm repair surgery. The rate of complications was statistically significantly higher after open abdominal aortic aneurysm repair (OR 1.86, 95% CI 1.47 to 2.34).

Authors' conclusions
There were no differences in perioperative survival between open and endovascular abdominal aortic aneurysm repair in the very elderly, but more major perioperative complications were observed after open abdominal aortic aneurysm repair. The findings should be interpreted with caution given the potential for selection bias in the studies across this review.

CRD commentary
This review had defined inclusion criteria for participants, interventions, outcomes and study designs. Searching encompassed a small number of databases, with no language restrictions. However, unpublished material was not eligible for inclusion, raising the possibility of publication bias. Validity assessment appeared to be limited. The results of validity assessment and details of study designs were not reported in full. It was unclear if more than one reviewer was involved in selecting, extracting and assessing studies, which meant that there was a possibility of bias in the review process.

Individual study results were combined without consideration of sample size or heterogeneity due to varying aneurysm size and changes in technique over time. Results were not based on direct comparisons of open with endovascular repair of abdominal aortic aneurysm.

In view of these issues, and limitations in the included studies, the results of this review should be treated with caution.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that a longer follow-up and larger sample size is needed to evaluate the durability of endovascular abdominal aortic aneurysm repair in the very elderly.

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