Mortality and morbidity rates after conventional abdominal aortic aneurysm repair

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Authors' objectives
To grade and analyse the mortality and morbidity rates of elective abdominal aortic aneurysm (AAA) surgery as reported over the last 12 years.

Searching
MEDLINE and Current Contents were searched from January 1985 to December 1996. Specific search terms were not described.

Study selection
Study designs of evaluations included in the review
Case series without controls were included.

Specific interventions included in the review
Conventional, elective, infrarenal AAA surgery was eligible for inclusion. Some of the included studies also incorporated data on non-elective surgery. Studies on suprarenal AAA surgery, emergency repair or ruptured aneurysms were excluded.

Participants included in the review
No actual inclusion criteria for the participants were stated. Studies with participants drawn from both hospital and population settings were included. The participants included high-risk patients (diabetes mellitus, coronary artery disease, renal failure, hypothermia or concurrent gastrointestinal surgery).

Outcomes assessed in the review
Mortality and post-operative morbidity (defined as 30-day or in-hospital death or postoperative complications) were assessed. Post-operative complications were those classified as moderate and severe by the Society of Vascular Surgery and the North American Chapter of the International Society for Cardiovascular Surgery (see Other Publications of Related Interest). The systemic complications recorded were: cardiac, cerebral (transient ischaemic attack or stroke), pulmonary, renal or gastrointestinal. The local vascular complications recorded were: limb ischaemia, intra- and post-operative haemorrhage, wound infection, graft infection, graft thrombosis and wound dehiscence.

How were decisions on the relevance of primary studies made?
The author did not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
The author attempted to group studies according to levels of evidence.

Data extraction
The author did not state how the data were extracted for the review, or how many of the reviewers performed the data extraction. Data on mortality and post-operative complications were extracted. The original data were recalculated to comply with the definition of 30-day or in-hospital death or complications.

Methods of synthesis
How were the studies combined?
Grouped by study design, the mean mortality rate and the mean rates of each complication were calculated and reported as a percentage with 95% confidence intervals (CIs). The numbers at risk used in each calculation are shown but it is unclear how they were derived. All of the studies reported mortality, but not all of the complications of interest.

How were differences between studies investigated?
In addition to grouping by study design, the difference in the average event rates between each group was compared statistically (the statistical method used was not reported). Aspects of study design were discussed in the text.

Results of the review
In total, 72 studies with a total of 37,654 patients were included. There were 2 prospective population-based studies (692 participants), 9 prospective hospital-based studies (1,677 participants), 13 retrospective population-based studies (21,409 participants), 32 retrospective hospital-based studies (12,019 participants), and 16 retrospective hospital-based studies in selected patient groups (1,857 participants).

Mortality.
The reporting rate of mortality was 100% for all types of studies. Mortality rates were similar for the prospective and retrospective population-based studies: 8.2% (95% CI: 6.4, 10.6) and 7.4% (95% CI: 7.0, 7.7), respectively. The mortality rates in the hospital-based studies, both prospective (3.8%, 95% CI: 3.0, 4.8) and retrospective (3.8%, 95% CI: 3.5, 4.2), were significantly lower than those in the population-based studies. The mortality rates for selected patient groups (3.5%, 95% CI: 2.8, 4.4) were similar to those for hospital-based studies.

Morbidity and systematic complications.
The rate of reporting was highest (46 to 96%) in the prospective hospital- and population-based studies. The most frequent complication recorded was of cardiac origin. The percentage cardiac complication was 10.6% (95% CI: 8.5, 13.2) for prospective population-based studies, 12.0% (95% CI: 10.5, 13.9) for prospective hospital-based studies, 11.1% (95% CI: 9.1, 13.6) for retrospective population-based studies, 8.9% (95% CI: 8.4, 9.5) for retrospective hospital-based studies, and 6.1% (95% CI: 4.9, 7.6) for retrospective hospital-based studies on specific patient groups.

Authors' conclusions
The reported mortality rates varied depending upon the setting of the studies. Hospital-based studies of elective AAA surgery can report mortality as less than 2%, whereas population-based studies of elective AA surgery report mortality of 8%. Post-operative morbidity was best described in prospective studies, with moderate or severe cardiac morbidity estimated between 10 and 12%, pulmonary morbidity between 5 and 10%, and renal morbidity between 5 and 7%.

CRD commentary
The aim of the review was clearly stated. The outcomes to be assessed were well described. The search terms were not given, and studies may have been missed as the databases searched were limited to MEDLINE and Current Contents. The inclusion criteria were stated for the intervention and the outcomes of interest, but not for the participants or study design. The potential for selection bias is unknown as the authors did not report how the studies were selected for inclusion. The attempt to group studies into levels of evidence was not based on a comprehensive appraisal of study design.

Observational studies are susceptible to many sources of bias, which were not explored in this review. The author appears to have pooled the studies by calculating simple averages; this is of questionable value. Since no details of the individual studies were presented, it is not possible to assess how appropriate it was to combine them all. For the same reason, it is not possible to assess the potential impact of confounding factors on the findings.

The conclusions based on pooled numerical estimates of event rates may not be reliable.
Implications of the review for practice and research
The author did not state any implications for further research and practice.

Bibliographic details

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10875218

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Aortic Aneurysm, Abdominal /mortality /surgery; Hospital Mortality; Humans; Incidence; Intraoperative Complications /epidemiology; Postoperative Complications /epidemiology; Prospective Studies; Retrospective Studies; Survival Rate; Vascular Surgical Procedures /mortality

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.