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Cochrane Database of Systematic Reviews 2017, Issue 1. Art. No.: CD010447.

DOI: 10.1002/14651858.CD010447.pub3.

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[Intervention Review]

Pharmacological treatment of vascular risk factors for reducing mortality and cardiovascular events in patients with abdominal aortic aneurysm

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Editorial group: Cochrane Vascular Group.

Publication status and date: New search for studies and content updated (no change to conclusions), published in Issue 1, 2017.

Citation: Robertson L, Atallah E, Stansby G. Pharmacological treatment of vascular risk factors for reducing mortality and cardiovascular events in patients with abdominal aortic aneurysm. *Cochrane Database of Systematic Reviews* 2017, Issue 1. Art. No.: CD010447. DOI: 10.1002/14651858.CD010447.pub3.

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ABSTRACT

Background

Pharmacological prophylaxis has been proven to reduce the risk of cardiovascular events in individuals with atherosclerotic occlusive arterial disease. However, the role of prophylaxis in individuals with abdominal aortic aneurysm (AAA) remains unclear. Several studies have shown that despite successful repair, those people with AAA have a poorer rate of survival than healthy controls. People with AAA have an increased prevalence of coronary heart disease and risk of cardiovascular events. Despite this association, little is known about the effectiveness of pharmacological prophylaxis in reducing cardiovascular risk in people with AAA. This is an update of a Cochrane review first published in 2014.

Objectives

To determine the long-term effectiveness of antiplatelet, antihypertensive or lipid-lowering medication in reducing mortality and cardiovascular events in people with abdominal aortic aneurysm (AAA).

Search methods

For this update the Cochrane Vascular Information Specialist (CIS) searched the Cochrane Vascular Specialised Register (14 April 2016). In addition, the CIS searched the Cochrane Central Register of Controlled Trials (CENTRAL) (2016, Issue 3) and trials registries (14 April 2016) and We also searched the reference lists of relevant articles.

Selection criteria

Randomised controlled trials in which people with AAA were randomly allocated to one prophylactic treatment versus another, a different regimen of the same treatment, a placebo, or no treatment were eligible for inclusion in this review. Primary outcomes included all-cause mortality and cardiovascular mortality.

Data collection and analysis

Two review authors independently selected studies for inclusion, and completed quality assessment and data extraction. We resolved any disagreements by discussion. Only one study met the inclusion criteria of the review, therefore we were unable to perform meta-analysis.



Main results

No new studies met the inclusion criteria for this update. We included one randomised controlled trial in the review. A subgroup of 227 participants with AAA received either metoprolol (N = 111) or placebo (N = 116). There was no clear evidence that metoprolol reduced all-cause mortality (odds ratio (OR) 0.17, 95% confidence interval (CI) 0.02 to 1.41), cardiovascular death (OR 0.20, 95% CI 0.02 to 1.76), AAA-related death (OR 1.05, 95% CI 0.06 to 16.92) or increased nonfatal cardiovascular events (OR 1.44, 95% CI 0.58 to 3.57) 30 days postoperatively. Furthermore, at six months postoperatively, estimated effects were compatible with benefit and harm for all-cause mortality (OR 0.71, 95% CI 0.26 to 1.95), cardiovascular death (OR 0.73, 95% CI 0.23 to 2.39) and nonfatal cardiovascular events (OR 1.41, 95% CI 0.59 to 3.35). Adverse drug effects were reported for the whole study population and were not available for the subgroup of participants with AAA. We considered the study to be at a generally low risk of bias. We downgraded the quality of the evidence for all outcomes to low. We downgraded the quality of evidence for imprecision as only one study with a small number of participants was available, the number of events was small and the result was consistent with benefit and harm.

Authors' conclusions

Due to the limited number of included trials, there is insufficient evidence to draw any conclusions about the effectiveness of cardiovascular prophylaxis in reducing mortality and cardiovascular events in people with AAA. Further good-quality randomised controlled trials that examine many types of prophylaxis with long-term follow-up are required before firm conclusions can be made.

PLAIN LANGUAGE SUMMARY

Medical treatment of vascular risk factors for reducing death and cardiovascular events in people with abdominal aortic aneurysm

Background

Abdominal aortic aneurysm (AAA) is a potentially life-threatening condition where the aorta enlarges and can ultimately burst, leading to massive internal bleeding. Current guidelines recommend that AAAs of 55 mm or more should be surgically repaired because, at this size, the risk of rupture outweighs the risk of surgical repair. AAAs between 30 mm and 54 mm in size are not as high risk and are generally monitored by regular scans to check for further enlargement. Recent research has shown that even after the aneurysm is repaired, the survival rate in people with AAA is poorer than in people without AAA. In most cases, the cause of death is a cardiovascular event, such as a heart attack or a stroke. Conditions such as high blood pressure or high cholesterol increase the risk of cardiovascular death. However, both conditions can be reversed through medical treatment. Given the increased risk of mortality with AAA, it is important to determine which medical treatment is most effective in preventing cardiovascular death in people with AAA.

In this review, researchers from Cochrane examined the effectiveness of medical treatment to treat vascular risk factors and reduce deaths and cardiovascular deaths and events in people with an AAA.

Study characteristics and key results

After searching for all relevant studies (until 14 April 2016), we found one study in which a subgroup of 227 people with AAA received either the beta-blocker metoprolol (medication that reduces blood pressure) or a placebo (dummy treatment). This study's results were imprecise for all causes of death and death from cardiovascular disease or nonfatal cardiovascular events at 30 days or six months after AAA repair. Side effects from the drug were reported for the whole study population and were not available for the subgroup of participants with AAA.

Quality of the evidence

We judged this study to be at a generally low risk of bias. We graded the quality of the evidence to low as we only included one small sized study in the review, there were few events reported and the result was consistent with benefit and harm.

Larger and longer studies are needed to find out which treatment is most effective. At present, people with AAA are offered a wide range of pharmacological treatment including antiplatelet drugs, antihypertensives and lipid-lowering drugs. Future trials should test available drugs to find the most effective strategy, whether that be one single drug or a combination of treatments. In addition, the acceptability of such interventions needs to be assessed and future studies should measure adverse side effects associated with these drugs and their impact on quality of life.