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Cochrane Database of Systematic Reviews 2004, Issue 4. Art. No.: CD000483.
DOI: [10.1002/14651858.CD000483.pub2](https://doi.org/10.1002/14651858.CD000483.pub2).

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[Intervention Review]

Circulatory volume expansion therapy for aneurysmal subarachnoid haemorrhage

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Editorial group: Cochrane Stroke Group.

Publication status and date: Edited (no change to conclusions), published in Issue 4, 2008.

Citation: Rinkel GJE, Feigin VL, Algra A, van Gijn J. Circulatory volume expansion therapy for aneurysmal subarachnoid haemorrhage. *Cochrane Database of Systematic Reviews* 2004, Issue 4. Art. No.: CD000483. DOI: [10.1002/14651858.CD000483.pub2](https://doi.org/10.1002/14651858.CD000483.pub2).

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ABSTRACT

Background

Secondary ischaemia is a frequent complication after aneurysmal subarachnoid haemorrhage (SAH), and responsible for a substantial proportion of patients with poor outcome after SAH. The cause of secondary ischaemia is unknown, but hypovolaemia and fluid restriction are important risk factors. Therefore, volume expansion therapy (hypervolaemia) is frequently used in patients with SAH to prevent or treat secondary ischaemia.

Objectives

To determine the effectiveness of volume expansion therapy for improving outcome in patients with aneurysmal SAH.

Search methods

We searched the Cochrane Stroke Group Trials Register (last searched September 2003). In addition we searched MEDLINE (1966 to January 2004) and EMBASE (1980 to January 2004) and contacted trialists to identify further published and unpublished studies.

Selection criteria

All randomised controlled trials of volume expansion therapy in patients with aneurysmal SAH. We also sought controlled trials based on consecutive groups of patients quasi-randomly allocated to treatment or control group and included these in the analysis if the two groups were well comparable with regard to major prognostic factors.

Data collection and analysis

Two reviewers independently extracted the data and assessed trial quality. Trialists were contacted to obtain missing information.

Main results

We identified three trials. One truly randomised trial and one quasi-randomised trial with comparable baseline characteristics for both groups were included in the analyses. Volume expansion therapy did not improve outcome (Relative Risk (RR) 1.0; 95% Confidence Interval (CI) 0.5 to 2.2), nor the occurrence of secondary ischaemia (RR 1.1; 95% CI 0.5 to 2.2). Hypervolaemia tended to increase the rate of complications (RR 1.8; 95% CI 0.9 to 3.7). In another quasi-randomised trial, outcome assessment was done only at the day of operation (7 to 10 days after SAH). In the period before operation, treatment resulted in a reduction of secondary ischaemia (RR 0.33; 95% CI 0.11 to 0.99) and case fatality (RR 0.20; 95% CI 0.07 to 1.2).

Authors' conclusions

The effects of volume expansion therapy have been studied properly in only two trials of patients with aneurysmal SAH, with very small numbers. At present, there is no sound evidence for the use of volume expansion therapy in patients with aneurysmal SAH.

PLAIN LANGUAGE SUMMARY**Circulatory volume expansion therapy for aneurysmal subarachnoid haemorrhage**

There is no evidence that administration of large volume of fluids is beneficial in patients with subarachnoid haemorrhage. Subarachnoid haemorrhage is a subset of stroke that occurs frequently in relatively young persons (mostly 40 to 60 years of age). Secondary ischaemia is an important contributor to poor outcome after a subarachnoid haemorrhage (half the patients die within a month after the haemorrhage). This type of ischaemia occurs 4 to 10 days (hence: secondary) after the haemorrhage, possibly due to fluid loss through increased urinary production. This review shows that there is no evidence to support giving additional fluids to not only compensate for the loss of fluid but also to increase the amount of fluid in the body.