Efficacy of lamina terminalis fenestration in reducing shunt-dependent hydrocephalus following aneurysmal subarachnoid hemorrhage: a systematic review
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CRD summary
The authors concluded that the efficacy of lamina terminalis fenestration in reducing shunt-dependent hydrocephalus remained unclear given unmatched cohort differences and inherent study limitations. Multiple limitations in the review processes (high risk of error and bias, lack of quality assessment, unjustified statistical analysis) make it difficult to determine the reliability of these conclusions.

Authors' objectives
To determine the efficacy of lamina terminalis fenestration in reducing aneurysmal sub-arachnoid hemorrhage-associated shunt-dependent hydrocephalus.

Searching
MEDLINE (1950 to 2007) was searched for studies written in English. Search terms were reported. Reference lists of identified papers, key journals and personal files were handsearched.

Study selection
All studies that evaluated the effect of lamina terminalis fenestration on the incidence of shunt-dependent hydrocephalus following aneurysmal sub-arachnoid hemorrhage were eligible for inclusion. Editorials, commentaries, case reports and reviews were excluded.

Most of the included studies enrolled patients with Fisher Grade 3 or 4 sub-arachnoid hemorrhage. Over half of the patients were female. Mean age was 51 years. The fenestrated and nonfenestrated groups varied significantly with regard to sex, age, clinical grade and aneurysm location. Most aneurysms were located in the anterior circulation (carotid arteries or its branches, anterior and middle cerebral arteries or anterior communicating artery, ACoA).

The authors did not state how many reviewers assessed studies for inclusion.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Data on treatments (fenestration versus no fenestration) and incidence of shunt-dependent hydrocephalus were extracted.

The authors did not state how many reviewers extracted data.

Methods of synthesis
Study data were combined by cohort and compared using X² and Student t test. Pooled relative risk (RR) and 95% confidence interval (CI) for the overall incidence of shunt-dependent hydrocephalus were calculated using the Cochran Mantel-Haenszel test. Heterogeneity in odds ratios was assessed using the Breslow-Day test.

Results of the review
Eleven studies were included (n=1,973 patients, range 40 to 534): five prospective studies (n=671) and six retrospective studies (n=1,302). Seven studies used proper controls and four used historical controls.

Overall, there was no significant association between lamina terminalis fenestration and reduced incidence of shunt-dependent hydrocephalus (RR 0.88, 95% CI 0.62 to 1.24; seven studies).
Authors' conclusions
The efficacy of lamina terminalis fenestration in reducing shunt-dependent hydrocephalus remained unclear given unmatched cohort differences and a number of inherent study limitations.

CRD commentary
The review question was clear with regard to eligible interventions and outcomes. Eligible study designs and participants were broadly defined. One database was searched for papers written in English and relevant studies may have been missed. It was not reported how many reviewers performed study selection and data extraction, so it was unclear whether these processes were subject to reviewer error and bias. The quality of included studies was unclear as no validity assessment was done. The decision to combine study results using a meta-analysis may have not been justified given significant study heterogeneity. The authors acknowledged the limitations of small sample sizes and poor quality of available literature. The authors' cautious conclusions reflected the evidence presented. Multiple limitations in review processes (risk of error and bias, lack of quality assessment and unjustified statistical analysis) make the reliability of the conclusions uncertain.

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

Research: The authors stated that well-designed multicentre randomised controlled trials on the efficacy of lamina terminalis fenestration on incidence of aneurysmal sub-arachnoid hemorrhage-shunt-dependent hydrocephalus were needed.

Funding
Doris Duke Clinical Research Fellowship.

Bibliographic details

PubMedID
19284236

DOI
10.3171/2009.1.JNS0821

Indexing Status
Subject indexing assigned by NLM

MeSH
Humans; Hydrocephalus /etiology /prevention & control /surgery; Subarachnoid Hemorrhage /complications /surgery; Ventriculoperitoneal Shunt

AccessionNumber
12009107579

Date bibliographic record published
25/11/2009

Date abstract record published
25/08/2010

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.