

Stereotactic Drainage Treatment is Superior to Conservative Medical Treatment in Patients with Small Volume Basal Ganglion Hemorrhage: A Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 26 March 2024 and was last updated on 26 March 2024.

INTRODUCTION

Review question / Objective This meta-analysis is intended to assess the impact of stereotactic drainage treatment in patients with basal ganglion intracerebral hemorrhage less than 50 mL compared to conservative medical treatment. The selected research types are randomized controlled trials and cohort studies.

Condition being studied Spontaneous intracerebral hemorrhage accounts for approximately 15% of all strokes and 50% of stroke-related mortality. It affects more than 2.8 million people around the world every year, among which basal ganglion is the most common position, representing approximately 50% of cerebral hemorrhage patients. Because of its unique anatomical location, hemorrhages of basal ganglia are associated with higher mortality than

the other position. Therefore, timely removal of hematoma and prevention of secondary impairment caused by the residual hematoma enlargement is the key to the treatment of basal ganglia hemorrhage. As a newly developed treatment in the recent 30 years, stereotactic drainage treatment has the advantages of alleviating the primary and the secondary injury caused by hemorrhage in time, improving the blood supply and accelerating the repairment of the injured tissue, which makes up for the shortcomings like large trauma and imprecision caused by traditional craniotomy. As a result, more and more studies have shown that stereotactic drainage treatment could promote the prognosis for the cerebral hemorrhage patients. However, for patients with basal ganglion hemorrhage, it was still controversial whether stereotactic drainage treatment could improve the recovery of

neurological function or reduce mortality compared to conservative medical treatment.

METHODS

Participant or population Patients confirmed intracerebral basal ganglion hemorrhage less than 50 mL.

Intervention Stereotactic drainage treatment.

Comparator Conservative medical treatment.

Study designs to be included Randomized controlled trials and cohort studies.

Eligibility criteria Inclusion criteria will be (1) Computed tomography confirmed diagnosis of basal ganglion spontaneous ICH; (2) The bleeding volume of all patients included was less than 50mL; (3) RCTs or cohort studies; (4) Follow-up time was not less than 1 month. Exclusion criteria will be (1) Imaging-based diagnosis of cerebrovascular abnormalities such as ruptured aneurysm, arteriovenous malformation and moyamoya disease as well as hemorrhagic transformation of ischemic infarct and recent recurrence (within 1 year) of cerebral hemorrhage. (2) Lack of data on the number of enrolled patients or follow-up outcome. (3) System reviews, meta-analyses or case reports. (4) Study quality was poor after assessing through quality appraisal tools (Newcastle-Ottawa Scale (NOS) score was less than 4 in observational studies or the bias risk was high evaluated by Cochrane risk-of-bias tool for randomized controlled trials). (5) Study was not written in English.

Information sources Databases like PubMed, the CENTRAL (Cochrane Central Register of Controlled Trials), Embase (Excerpt Medical Database), Web of Science, Scopus and the references of the literature will be retrieved in order to ensure that the search is comprehensive enough.

Main outcome(s) The rate of excellent neurological function recovery defined as a modified Rankin Scale (mRS) score of 0-2 in the 12 months and mortality after treatment.

Quality assessment / Risk of bias analysis Newcastle-Ottawa Scale (NOS) for observational studies and Cochrane risk-of-bias tool for randomized controlled trials.

Strategy of data synthesis All analyses will be performed using STATA 17.0 and Review Manager

5.4. Dichotomous variables will be presented as odds ratios (OR) and Continuous variables will be displayed as weighted mean difference (WMD). 95% confidence intervals (CI) will be constructed to assist the analysis. Q^2 and I^2 statistics will be used to assess the existence and magnitude of between-study heterogeneity. In the process of analysis, if the heterogeneity is less than 50%, we use the fixed effect model, otherwise we adopt the random effect model. Statistical significance is established at $P < 0.05$. Forest plots will be constructed to demonstrate the pooled effect estimate. Funnel plots, Begg's test and Egger's test will be examined for detecting potential publication bias. Sensitivity analyses will be undertaken by the sequential exclusion of one study.

Subgroup analysis We will conduct a subgroup analysis according to the patient's age, hematoma volume and follow-up time.

Sensitivity analysis We will use STATA for sensitivity analysis to reflect the sensitivity of the results by deleting the changes in the amount of effect of one of the articles.

Language restriction We only accept documents published in English.

Country(ies) involved China.

Keywords stereotactic drainage treatment; conservative medical treatment; basal ganglion hemorrhage; small volume; meta-analysis.

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