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Meta-analysis of the safety and efficacy of intensive blood pressure control after thrombectomy

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ADMINISTRATIVE INFORMATION

Support - Department of Neurosurgery, Guang'an People's Hospital, Guang'an, Sichuan, China.

Review Stage at time of this submission - Completed but not published.

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 03 June 2024 and was last updated on 03 June 2024.

INTRODUCTION

Review question / Objective Our aim is to assess the safety and efficacy of intensive blood pressure management compared to less intensive treatment in patients with successful reperfusion following EVT, addressing this controversy.

Condition being studied Acute ischemic stroke represents a significant global health challenge, and endovascular thrombectomy (EVT) has emerged as a pivotal milestone in its treatment, profoundly altering the organization and operation of stroke services. By eliminating obstruction or clots within arteries, EVT can effectively restore blood flow to ischemic regions in the brain, known as penumbral tissue. However, despite achieving favorable radiological outcomes, many patients exhibit poor functional recovery, with high risks of symptomatic intracranial hemorrhage and other forms of reperfusion injury. Consequently, there is a growing interest in adjunctive approaches post-EVT to protect or sustain penumbral tissue from

reperfusion injury. Blood pressure emerges as a modifiable factor to prevent reperfusion injury, given its frequent elevation and clear prognostic significance in acute ischemic stroke. While guidelines advocate for conservative blood pressure control pre-EVT and post-EVT[10], recent confidence in EVT's efficacy, desire to mitigate ischemia-reperfusion injury risks, and influential data linking presentation blood pressure to subsequent clinical outcomes have shifted opinions towards more aggressive blood pressure control in research and practice[11]. Nevertheless, in the absence of randomized evidence, guidelines continue to recommend maintaining lower blood pressure levels post-EVT, consistent with those for patients eligible for intravenous thrombolysis after acute ischemic stroke.

METHODS

Participant or population Patients with acute ischemic stroke undergoing endovascular thrombectomy.

Intervention Intensified blood pressure control.

Comparator Standard blood pressure control.

Study designs to be included By searching the EMBASE, PubMed, and Cochrane Library databases, we included randomized controlled trials that compare standard blood pressure control with intensive blood pressure control in patients with acute ischemic stroke undergoing endovascular thrombectomy (EVT). A meta-analysis of the results from these trials was conducted to evaluate the impact of standard versus intensive blood pressure control on the prognosis of these patients.

Eligibility criteria After excluding duplicate samples, we screened the remaining literature according to the following criteria: 1) Cases of stroke diagnosed by imaging examinations. 2) Prospective studies comparing two different reinforcement standards for blood pressure treatment to assess their effects on stroke. 3) Studies with a sample size larger than 50 cases. We excluded conference abstracts, case reports, clinical trials, reviews, and letters from the search results of RCTs. Additionally, we excluded non-English literature, abstracts, and studies unrelated to stroke. We assessed duplicate or overlapping data in publications and only included the most comprehensive studies. Unpublished data were not sought.

Information sources EMBASE, PubMed, and Cochrane Library databases.

Main outcome(s) After careful analysis, our conclusion is that intensified blood pressure control, compared to standard blood pressure control following endovascular treatment in acute stroke patients, does not yield better clinical outcomes and may even lead to inferior ones. Moreover, there is no significant disparity in terms of safety between the two approaches.

Quality assessment / Risk of bias analysis We used the Newcastle-Ottawa Scale to assess the quality of these RCTs.

Strategy of data synthesis The heterogeneity was assessed using the I² statistic and the chi-square test. Heterogeneity was considered significant when I² > 50%. If the included studies had I² < 50% for the intervention outcomes, the fixed-effect model of Mantel-Haenszel method was used. Otherwise, the random-effects model of Mantel-Haenszel was employed. Visual funnel plots were used to evaluate publication bias. The statistical

significance was set at p-value < 0.05, indicating a statistically significant result. All analyses were conducted using Review Manager (RevMan, version 5.4).

Subgroup analysis NA.

Sensitivity analysis NA.

Country(ies) involved China.

Keywords ischemic stroke, endovascular thrombectomy, blood pressure, outcomes, meta-analysis.

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