

INPLASY PROTOCOL

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None declared.

Mechanical thrombectomy with intra-arterial alteplase provided better functional outcome for AIS-LVO: a meta-analysis

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Review question / Objective: Intra-arterial thrombolysis using alteplase during mechanical thrombectomy (MT) has been proven to have better outcome than MT alone in ischemic stroke management by several clinical trials. We performed this meta-analysis to estimate the efficacy and safety of MT with intra-arterial alteplase therapy.

Condition being studied: Previous data comparing MT with intra-arterial alteplase and MT alone were mainly derived from observational studies. Recently, a randomized controlled trial published the results of intra-arterial alteplase following successful MT. It drew a conclusion that intra-arterial alteplase as adjunct therapy to MT resulted in a greater likelihood of excellent neurological outcomes at 90 days. We did this meta-analysis to estimate the efficacy and safety of MT with intra-arterial alteplase. We performed further subgroup analysis to investigate the potential value in specific patients.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 06 April 2022 and was last updated on 06 April 2022 (registration number INPLASY202240027).

INTRODUCTION

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METHODS

Participant or population: Patients with AIS-LVO.

Intervention: MT with intra-arterial alteplase.

Comparator: MT alone or MT with placebo.

Study designs to be included: Retrospective, perspective cohort study or randomized controlled trial (RCT) study design.

Eligibility criteria: (1)participants: patients with AIS-LVO; (2)intervention: MT with intra-arterial alteplase; (3)control : MT alone or MT with placebo; (4)outcomes: efficacy outcomes including the mRS and mTICI; safety outcomes including hemorrhage transformation and mortality. Included studies were not requested to have all the outcomedata.

Information sources: PubMed, MEDLINE, Cochrane Library and ClinicalTrials.gov .

Main outcome(s): Efficacy outcomes included recanalization assessed by the mTICI and functional outcome assessed at 3 months by the mRS. The good functional outcome was set as mRS 0 to 2. The successful recanalization was defined as mTICI \geq 2b. Safety outcomes were estimated with adverse effects, including mortality, symptomatic intracerebral hemorrhage (sICH), parenchymal hemorrhage type 2 (PH-2), and any hemorrhage.

Quality assessment / Risk of bias analysis:

The risk of bias was assessed used the MINORS scale for observational studies. Each study was checked with the 12-item MINORS scale to obtain a total mark that representing the quality of the study. The RCT was assessed with Cochrane Collaboration criteria, including selection bias, performance bias, detection bias, attrition bias, reporting bias and other potential bias, each of which was classified as “low”, “high” or “unclear”.

Strategy of data synthesis: We use STATA 16.0 for data analysis. Statistical heterogeneity was estimated I² statistic. All analyses used a random effect model. Odds ratios (ORs) were used for dichotomous variables. P<0.05 was considered statistically significant. Sensitivity analysis was used to explore the stability of the consolidated results.

Subgroup analysis: We did subgroup analysis according to the baseline characteristics such as age, NIHSS score and the timing of intra-arterial alteplase administration. We set three subgroup marks: (1)age above or below 70 years old; (2)NIHSS above or below 16; (3)IAT as adjunct or rescue therapy to MT.

Sensitivity analysis: Sensitivity analysis was used to explore the stability of the consolidated results.

Country(ies) involved: China.

Keywords: Intra-arterial thrombolysis; alteplase; mechanical thrombectomy; acute ischemic stroke.

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