INPLASY

The efficacy and safety of intravenous infusion of Glycoprotein IIb/IIIa Inhibitors during stent implantation in cerebral infarction: A systematic review and a meta-analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Data extraction.

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 28 August 2024 and was last updated on 28 August 2024.

INTRODUCTION

Review question / Objective This meta-study combined with existing cohort studies to investigate the efficacy and safety of antiplatelet agents during stent implantation in patients with cerebral infarction.

Rationale The effects of Glycoprotein IIb/IIIa Inhibitors during stent implantation are evaluated by comparing the efficacy and safety indexes between the two groups.

Condition being studied Intracranial atherosclerotic disease (ICAD) is one of the most common causes of stroke worldwide. Among ICAD-related stroke patients with ≥70% stenosis of the great arteries, the risk of stroke recurrence is the highest, and the recurrence rate within 1 year can be >20%. The WASID trial suggested that the incidence of cerebral infarction within one year was about 12% in patients with symptomatic intracranial stenosis who were treated with aspirin or warfarin, while the GESICA study suggested that despite drug therapy, the recurrence rate of cerebral infarction within two years was 38.2%. For these high-risk patients, revascularization in the hypoperfusion area is a viable treatment strategy. SAMMPRIS(Stent placement and Active Medical Management for the Prevention of recurrent Stroke in patients with intracranial stenosis) and VISSIT (Vitesse intracranial stent study for ischemic treatment), due to their high perioperative risk (30-day stroke/death risk 14.7% and 24.1%, respectively), No benefit of intracranial stenting has been shown). Studies have found that after stent implantation, due to platelet activation and aggregation on the stent surface, there is a risk of early intrastent restenosis and distal occlusion, and perforating branch occlusion is the most common complication . However, at present, there is a contradiction in the optimal anti-platelet strategy on how to prevent stent thrombosis without increasing the rate of symptomatic intracranial hemorrhage . Therefore, appropriate anti-platelet strategies are needed.
Currently, three FDA-approved GP IIb/IIIa receptor antagonists have been used after coronary artery

stenting, including etifibatide, acximab, and tirofiban. GP IIb/IIIa receptor antagonists block the common final pathway of platelet aggregation, thereby preventing thrombosis and hemostatic (TF) -induced prothrombin activation. The antiplatelet and anticoagulant effects of GP IIb/IIIa receptor antagonists have been shown to reduce distal microembolization and reduce post-stenting inflammatory response . GPI requires the use of 80% of the GP IIb/IIIa receptor to achieve sufficient therapeutic effect, because in the case of oral GP IIb/IIIa receptor antagonists, paradoxical results of fibrinogen binding associated with plasma levels may be produced, so intravenous administration is recommended . Data from the PRISM-PLUS clinical trial show that tirofiban in addition to heparin and aspirin can significantly reduce mortality after 7 days of treatment for acute myocardial infarction or refractory ischemia, and greater benefits have been observed in angioplasty A randomized controlled trial on the prevention of stent thrombosis found that the use of tirofiban (0.1ug/kg/ min) before stent implantation could reduce the rate of early stent thrombosis without increasing the rate of intracranial hemorrhage . Active use of tirofiban seems reasonable in patients with an underlying mechanism such as intracranial atherosclerosis (ICAS). However, timely identification of the pathogenesis and mechanisms of eligible ischemic stroke cases prior to endovascular surgery is another major challenge for emergency neurologists . There are currently cohort studies evaluating the efficacy and safety of combined antiplatelet therapy during stenting, but the number of patients included is small and the results are conflicting, and there is no meta-analysis or guidelines or expert consensus to answer these questions.

So. This meta-study combined with existing cohort studies to investigate the efficacy and safety of antiplatelet agents during head and neck stent implantation in patients with cerebral infarction.

METHODS

Search strategy Search databases for articles: Pub med,Embase,web of science,Cochrane library. It was last retrieved in August 2024. Search using MESH subject words + free words: (Tirofiban OR N-(Butylsulfonyl) -o -(4-(4-piperidyl)butyl) -L-Tyrosine OR L 700462 OR L-700,462 OR MK 383 OR MK-383 OR Aggrastat OR Tirofiban Hydrochloride OR Tirofiban Hydrochloride Monohydrate) AND (Stents OR Angioplasties OR Endoluminal Repair OR Transluminal Angioplasty OR Percutaneous Transluminal Angioplasty).

Participant or population Patients with cerebral infarction requiring craniocerebral vascular stent implantation.

Intervention Intravenous infusion of GP IIb/IIIa receptor antagonist during stent implantation.

Comparator Not intravenous infusion of Glycoprotein IIb/IIIa Inhibitors during stent implantation.

Study designs to be included Cohort studies.

Eligibility criteria Inclusion criteria: 1) Cohort study 2) Combined GP IIb/IIIa during stenting 3) included at least one primary outcome measure or safety outcome measure. Exclusion criteria: 1) case reports 2) case-control studies 3) animal trials 4) use of GP IIb/IIIa inhibitors after stenting or before stent implantation 5) Literature with no full text, no data extraction, or missing data.

Information sources Pub med,Embase,web of science,Cochrane library.

Main outcome(s) Efficacy outcome indicators: recirculation rate (TICI≥2b), 90 days mRS≤2, perioperative intra-stent re-occlusion. Safety outcome measures: perioperative symptomatic intracranial hemorrhage, 30-day mortality.

Additional outcome(s) None.

Data management Review Manager (RevMan) is used for all data (version 5.4; Cochrane Collaboration, 2020).

Quality assessment / Risk of bias analysis The risk of bias in the final literature was assessed by two investigators. The Newcastle-Ottawa Scale (NOS) tool is used to assess the risk of bias.

Strategy of data synthesis Relative Risk (RR) and 95%CI (Confidence internal) are used to assess the rate of recirculation (TICI≥2b), intra-stent re-occlusion within 24 hours of mRS≤2, all-cause mortality, and symptomatic intracranial hemorrhage. The I2 statistic is used to quantify inter-study heterogeneity, with I2 values of about 25%, 50%, and 75% defined as mild, moderate, and severe heterogeneity, respectively. The fixed effect model was used for I250. All statistical tests used in this study were two-tail tests, and the significance level is set at $P<0.05$. Subgroup analyses based on vascular occlusion sites are performed to assess superior functional outcomes. Sensitivity analysis is performed by eliminating each study one by one. Funnel plots are used to

assess publication bias. If more than 10 articles ware included, Egger test is used to assess publication bias, and Review Manager (RevMan) is used for all data (version 5.4; Cochrane Collaboration, 2020).

Subgroup analysis Subgroup analysis is performed according to the stenosis site of blood vessels.

Sensitivity analysis The sensitivity analysis is conducted by excluding the studies one by one, and there is no significant change in the combined results. The results of this meta-analysis were robust. The funnel plot is used to test publication bias. The funnel plot is symmetrical and there is no significant publication bias. Egger test is not conducted because the single factor meta-analysis did not exceed 10 articles.

Language restriction Eingish.

Country(ies) involved China.

Other relevant information None.

Keywords Clinical efficacy , stent implantation ,Glycoprotein IIb/IIIa , Meta-analysis.

Contributions of each author
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Author 3 - Qing yun.
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