INPLASY

Statin or no statin after Pipeline Embolization therapy for intracranial aneurysms: a meta-analysis

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ADMINISTRATIVE INFORMATION

Support - Not apply.

Review Stage at time of this submission - Risk of bias assessment.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2024120079

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 December 2024 and was last updated on 18 December 2024.

INTRODUCTION

Review question / Objective Does statin provides a better outcome for patients with intracranial aneurysms who undergoing pipeline embolization ?

Condition being studied Statins play a significant role in the endovascular treatment of patients with cerebral aneurysms. These medications, traditionally used for managing cholesterol levels and preventing cardiovascular events, have garnered increasing attention in the context of neurovascular diseases. Their importance lies not only in their lipid-lowering effects but also in their potential to modulate vascular inflammation, improve endothelial function, and stabilize atherosclerotic plaques, all of which are crucial in the management of patients with cerebral aneurysms. However, there is a lack of evidence about the importance of statins in Pipeline Embolization treatment. Therefore, we aim to perform a systematic review and meta-analysis examining the efficacy of Statins in patients with cerebral aneurysms treated by PED, specifically interested in end-points such as complete occlusion of aneurysms, as well as the ischemic and hemorrhagic outcomes.

METHODS

Participant or population Patients with intracranial aneurysms who undergoing Pipeline Embolization.

Intervention Statins.

Comparator Nonstatins.

Study designs to be included Randomized or observational studies.

Eligibility criteria (1) randomized trials or observational studies; (2) comparing statin use to non statin use; (3) enrolling patients who underwent Pipeline Embolization for intracranial aneurysms; and (4) studies reporting at least one outcome among complete occlusion of aneurysm;

stenosis of parent arteries; in-stent stenosis; ischemic complications, hemorrhage complications, all-cause mortality, neurologic mortality, and favorable [modified Rankin Scale (mRS) ⩽1] and excellent (mRS ⩽2) functional outcome.
The criteria for excluding studies are (1) no control group; (2) patients without flow diverter procedure; (3) no outcomes of interest.

Information sources Cochrane, Pubmed, Embase.

Main outcome(s) Complete occlusion of aneurysm and total ischemic complications and total hemorrhage complications. Total ischemic complications included total ischemic complications, major ipsilateral ischemic stroke, ischemic stroke and thromboembolic complications (all). Total hemorrhagic complications covered total subarachinoid hemorrhage, major ipsilateral intracranial hemorrhage and hemorrhagic complications (all). Complete occlusion of aneurysm, total ischemic complications, total hemorrhagic complications. The effect measure is relative risk (RR).

Quality assessment / Risk of bias analysis It was evaluated with the Risk of Bias in Non-Randomized Studies - of Interventions (ROBINS-I).

Strategy of data synthesis The systematic review and meta-analysis will be performed in line with recommendations from the Cochrane Collaboration and the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement guidelines. We will extract the data from individual studies using relative risk (RR). Treatment effects for binary endpoints will be compared using pooled RR with 95% confidence intervals. Weighted mean differences will be used to pool continuous outcomes. Heterogeneity will be evaluated with Cochran Q test and I^2 statistics; p values inferior to 0.10 and I^2>25% will be considered significant for heterogeneity. The decision to use either a random-effect or fixed-effect model will be made after a critical appraisal of all included studies. R (version 4.2.2, R Foundation for Statistical Computing, Vienna, Austria) will be used for statistical analysis.

Subgroup analysis We performed a subgroup analysis from PSM data and No PSM data for all outcomes.

Sensitivity analysis We performed leave-one-out sensitivity analyses.

Country(ies) involved Brazil and India.

Keywords Pipeline embolization; intracranial aneurysm; statin; Flow-diverter; stent.

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