

INPLASY PROTOCOL

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None declared.

The therapeutic effect of inhibition of CCR5 on animal models of stroke or traumatic brain injury: A Systematic review and Meta-Analysis

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Review question / Objective: The purpose of this meta-analysis is to evaluate the therapeutic effect of CCR5 on stroke or traumatic brain injury. **P:** Animal model of stroke or traumatic brain injury. **I:** CCR5 drug inhibitor or CCR5 knockout or CCR5 silencing. **C:** Do not take intervention measures, or take placebo, sham treatment. **O:** Infarction volume, TUNEL positive cells. **S:** Controlled studies with at least one comparative group.

Condition being studied: Stroke, commonly known as "stroke", is the "number one killer" endangering life and health. TBI has caused persistent morbidity and a large number of deaths in all countries and people of all ages, which is a public health challenge with extensive impact but not paid enough attention to. The treatment and rehabilitation of stroke and TBI will pay a huge economic cost, and bring huge burden to patients and society. CCR5 is widely expressed in the central nervous system (CNS), is engaged in various physiological activities such as brain development, neuronal differentiation, communication, survival, and learning and memory capabilities, and is also involved in the development of numerous neurological diseases. The therapeutic effect of CCR5 as a therapeutic target to promote neurological rehabilitation in stroke and traumatic brain injury has not been systematically reported. Therefore, this meta-analysis aims to explore the therapeutic effect of inhibiting CCR5 on stroke or traumatic brain injury, and provide effective basis for clinical rehabilitation in stroke and after traumatic brain injury.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 11 January 2023 and was last updated on 11 January 2023 (registration number INPLASY202310026).

INTRODUCTION

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METHODS

Participant or population: Animal model of stroke or traumatic brain injury.

Intervention: CCR5 drug inhibitor or CCR5 knockout or CCR5 silencing.

Comparator: Do not take intervention measures, or take placebo, sham treatment.

Study designs to be included: Animal experiment.

Eligibility criteria: 1. Inclusion criteria 1.1 Experimental design: Animal experiments refer to scientific research conducted in laboratories using animals as research objects for the purpose of acquiring new

knowledge in biology, medicine, etc. or solving specific problems. 1.2 Research objects: Animal models with stroke or traumatic brain injury. Animal models with stroke or brain injury modeling methods can be included. There were no restrictions on age, sex, species and modeling methods for the included subjects. 1.3 Intervention measures: The experimental group must use CCR5 drug inhibitors (drug type, drug dose, administration method, course of treatment unlimited) or knock out and silence CCR5 (method unlimited). The control group did not take intervention measures, or took placebo and sham treatment. 1.4 Main outcome criteria: infarct volume, astrocytes (GFAP positive), reactive microglia (IBA-1 positive), TUNEL positive cells. 2. Exclusion criteria: documents such as repeated reports, poor quality, imprecise design, and unclear outcome specific data will be excluded.

Information sources: Both Chinese and English database resources will be searched for the identification of valid data, including CNKI, PubMed, Cochrane, Wanfang Database, VIP Database, Web of Science, Ovid-Medline, and SinoMed database. We will search the databases from their inception to December 06, 2022.

Main outcome(s): Infarct volume, astrocytes (GFAP positive), reactive microglia (IBA-1 positive), TUNEL positive cells.

Additional outcome(s): CREB.

Quality assessment / Risk of bias analysis: SYRCLE's risk of bias tool and CAMARADES List will be applied to evaluate the risk of bias.

Strategy of data synthesis: Since all selected results are continuous variables, we will calculate the standardized mean difference and the associated 95% confidence interval. Chi square test or I² test is used to evaluate heterogeneity. I² 250% was interpreted as highly heterogeneous and a random effect model was used. For a small number of studies

and inconsistent data, we will report a descriptive summary.

Subgroup analysis: If necessary, a possible subgroup analysis will be performed based on the heterogeneity analysis. The potential variables for subgroup analysis are detection time and induction methods of animal models.

Sensitivity analysis: We will perform global or local sensitivity analysis to evaluate the effect of each research on the random effects model, if necessary.

Country(ies) involved: China.

Keywords: CCR5,stroke, traumatic brain injury, Systematic review, Meta-Analysis, Animal experiments.

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