

**Efficacy and safety of stem cells in the treatment of glaucoma: systematic review and Meta analysis based on animal experiments**

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**ADMINISTRATIVE INFORMATION****Support** - None.**Review Stage at time of this submission** - Preliminary searches.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202520023**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 5 February 2025 and was last updated on 5 February 2025.**INTRODUCTION**

**Review question / Objective** The incidence of glaucoma is increasing year by year, and it is one of the important causes of blindness in the world. Therefore, the efficacy of stem cells in the treatment of glaucoma will attract more and more attention. The purpose of this systematic review will be to accurately evaluate the efficacy and safety of stem cells in the treatment of glaucoma.

**Condition being studied** Glaucoma is a common eye disease that causes blindness, characterized mainly by increased intraocular pressure and optic nerve injury. If not treated in time, it will eventually lead to vision loss. Glaucoma is projected to continue being the second leading cause of blindness in the world, second only to cataracts, and it will seriously affect the lives of tens of millions of people. Therefore, the development of new treatments that can repair the optic nerve and restore vision will become the key to future glaucoma research.

**METHODS****Participant or population** Glaucoma animal model.**Intervention** Stem cell.**Comparator** Blank control or placebo control.**Study designs to be included** RCT.**Eligibility criteria**

Inclusion criteria

- (1) the object of study is the animal model of glaucoma which is modeled and verified successfully.
- (2) there is no limit to the method of making glaucoma model.
- (3) there are no restrictions on the types of stem cells.
- (4) Randomized controlled trial.
- (5) there are no restrictions on animal species, sex, age and body weight.

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(6) the observation indexes included intraocular pressure, retinal ganglion cell count, expression of brain-derived neurotrophic factor, glial-derived neurotrophic factor and insulin-like growth factor, survival, migration and differentiation of transplanted stem cells, at least one of these.

Exclusion criteria:

- (1) there is no control group.
- (2) No randomized control was used.

**Information sources** PubMed, Web of Science, Embase, Cochrane Library, Scopus, CNKI, VIP, CBM.

**Main outcome(s)** Effectiveness.

**Additional outcome(s)** Adverse reactions.

**Quality assessment / Risk of bias analysis** SYRCL's risk of bias tool for animal studies.

**Strategy of data synthesis** If heterogeneity exists, random-effects models will be used to combine the data; if heterogeneity does not exist, fixed-effects models will be used to combine the data.

**Subgroup analysis** Subgroup analyses will be conducted based on factors such as animal species, stem cell types, and the timing of different observational indicators.

**Sensitivity analysis** If the combined results of the remaining studies do not significantly differ after deleting any one of the studies, it will indicate that the sensitivity analysis will have been passed.

**Country(ies) involved** China.

**Keywords** Stell cell, Glaucoma.

#### **Contributions of each author**

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