

Comparative efficacy of the five most common traditional Chinese medicine monomers in reducing intimal hyperproliferation in rats with carotid balloon injury: A network Meta-Analysis

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Xie, L¹; Mao, TS²; Qu, XY³; Feng, RL⁴; Yang, ZF⁵; Lin, Q⁶; Wan, J⁷.**Corresponding author:**

Jie Wan

wdyxrld@163.com

Author Affiliation:

Dongzhimen Hospital of Beijing University of Chinese Medicine.

ADMINISTRATIVE INFORMATION**Support** - National Natural Science Foundation of China.**Review Stage at time of this submission** - Data extraction.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202410054**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 January 2024 and was last updated on 13 January 2024.**INTRODUCTION**

Review question / Objective This study compared the efficacy of the five most common traditional Chinese medicine (TCM) monomers in reducing hyperproliferation in carotid balloon injury rats using network meta-analysis (NMA).

Condition being studied Reduction of intimal hyperproliferation in carotid artery balloon injured rats by traditional Chinese medicine monomers. Two trained researchers screened papers and rigorously extracted data according to inclusion/exclusion criteria, and then cross-checked the screening results. In case of disagreement, it was resolved in consultation with a third researcher.

METHODS

Search strategy We searched scientific databases such as PubMed, Ovid-Embase, Web of Science, China National Knowledge Infrastructure (CNKI), China Science and Technology Journal Database

(VIP), Wanfang Database, and China Biomedical Literature Database (CBM). The search period was from the establishment of the database to January 2024. Terms such as "carotid balloon injury", "angioplasty", "carotid artery", "balloon injury", "balloon", "ginsenoside", "astragaloside", "tanshinone", "chuanxiongine", and "panaxoside" as subject terms, keywords, free text words, or MeSH (Medical Subject Headings Headings) terms to identify potentially eligible studies. The search strategy was adapted for each database. There were no restrictions on blinding, language or year of publication.

Participant or population Rat model of carotid balloon injury.

Intervention TCM monomers (GS, ASIV, TPNS, TIIA, TMP).

Comparator (1) Positive control: comparison between different herbal monomers. (2) Negative control: saline, blank control, conventional solvent.

Study designs to be included Control studies were included.

Eligibility criteria Exclusion Criteria: (1) Other causes of carotid artery injury models, such as carotid artery ligation models, pharmacologic artery injury. (2) Studies that do not report the intima-media ratio. (3) Repeatedly published studies. (4) Studies that did not provide complete raw data or data could not be extracted.

Information sources We searched scientific databases such as PubMed, Ovid-Embase, Web of Science, China National Knowledge Infrastructure (CNKI), China Science and Technology Journal Database (VIP), Wanfang Database, and China Biomedical Literature Database (CBM). The search period was from the establishment of the database to January 2024.

Main outcome(s) The intima-media ratios (intima-media area ratio or intima-media thickness ratio) at 2 weeks after carotid balloon injury in rats with TCM monomer intervention were included in the final analysis. The intima-media ratios at 2 weeks after carotid balloon injury in rats with TCM monomer intervention were included in the final analysis.

Quality assessment / Risk of bias analysis Independent reviewers assessed the quality of the included studies using SYRCLE's Risk of Bias Tool for Animal Studies. SYRCLE's Risk of Bias Tool consists of ten items: (1) Sequence Generation; (2) Baseline Characterization; (3) Assignment Concealment; (4) Randomized Housing; (5) Blinded Intervention in Animal Studies; (6) Randomized Outcome Assessments; (7) Blinded Assessment of Outcomes; (8) Incomplete Outcome Data; (9) Selective outcome reporting; and (10) Other types of bias. Disagreements were negotiated or decided by a third reviewer. Each study was rated as "low," "high," or "unclear" risk.

Strategy of data synthesis (1) Traditional Meta-Analysis: A traditional meta-analysis was conducted using STATA 17 software to compare the results of the intra-medial ratio between TCM monomers and negative controls. Standardized mean difference (SMD) was regarded as the effect analysis statistic and provided its 95% confidence interval (CI). The heterogeneity among included studies was analyzed by χ^2 test (test level was $\alpha=0.1$) and was quantitatively judged by I^2 . If there was no statistical heterogeneity, Fixed-effects models were used for the meta-analysis; otherwise, meta-analysis was performed using random-effects model. The α level was set at 0.05.

(2) Network Meta-Analysis: We applied STATA 17 software to the extracted continuous variables for network meta-analysis (NMA) and generated the SMD with 95% CI. The evidence network diagram for the comparison of five TCM monomers intervening in carotid balloon injury after surgery was drawn to visually display the relationship between each TCM monomer and the size of the sample. The surface under the cumulative ranking area (SUCRA) was used to rank the probabilities for different interventions. The SUCRA values range from 0 to 100%, assigned to the worst and best treatments. Publication bias and small-sample effects were assessed by funnel plots.

Subgroup analysis No subgroup analysis was performed.

Sensitivity analysis The sensitivity analysis of traditional meta-analysis was performed by STATA software, and the sensitivity of the article was reflected by the effect size after the deletion of one of the articles.

Country(ies) involved China.

Keywords Traditional Chinese Medicine; monomer; balloon injury; intima-media ratios; animal studies; network meta-analysis.

Contributions of each author

Author 1 - Long Xie.
Email: wdyxrd@163.com
Author 2 - Tianshi Mao.
Author 3 - Xinyan Qu.
Author 4 - Ruli Feng.
Author 5 - Zhifei Yang.
Author 6 - Qian Lin.
Author 7 - Jie Wan.