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Comparison of the protective effect of ischemic preconditioning and remote ischemic preconditioning against ischemia reperfusion injury after hepatectomy: a systematic review and network meta-analysis

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ADMINISTRATIVE INFORMATION

Support - No financial sources.

Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

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 03 July 2023 and was last updated on 03 July 2023.

INTRODUCTION

Review question / Objective Compare the relative efficacy of ischemic preconditioning and remote ischemic preconditioning for hepatic injury during liver resection.

Condition being studied Hepatic resection, increasingly carried out worldwide due to advancements in safety, has evolved into the most efficient treatment for patients with primary and secondary hepatic malignancy and the only choice for a great many benign conditions. Local ischemic preconditioning (LIPC) is an underlying protective process that renders liver undergo artificially a temporary period of ischemia followed by reperfusion prior to hepatectomy formally to better adapt to the long-term ischemic insults. Currently, experimental and clinical evidence has proven that LIPC can ameliorate hepatic ischemic injury in humans.
Subsequently, as a derivative form known as remote ischemic preconditioning (RIPC)of ischemic preconditioning emerged because it was noticed that ischemic preconditioning can work not only within organs but also between different organs.
RIPC only requires one or more brief cycles by simple inflation and deflation of a standard blood pressure cuff placed on a limb before the start of surgery to play an organ protective role, with the advantages of user-friendly control, no additional surgical procedures, and no increase in surgical duration. These conveniences has facilitated its translation into the clinical setting rapidly.

METHODS

Participant or population People with relevant diseases requiring hepatectomy (aged over 18 years).

Intervention Ischemic preconditioning and remote ischemic preconditioning.

Comparator No preconditioning.

Study designs to be included RCTs.

Eligibility criteria Studies were identified according to the following inclusion criteria: (I) participants: human with relevant diseases requiring hepatectomy (aged over 18 years). (II) comparison: ischemic preconditioning and remote ischemic preconditioning with N-Preconditioning, (III) outcome: some outcome indicator that reflect liver function including AST or ALT need to be reported. and (IV) methodological criterion: prospective RCT.

Information sources We searched the following databases: Embase, Pubmed and the Cochrane Library from database inception until January 2023. China National Knowledge Infrastructure (CNKI) was searched to identify additional studies. In addition, Meta-analysis and systematic reviews related to this have been mined in order to identify more potentially acceptable studies.
We tried to contact study authors when there were missing or unclear data.

Main outcome(s) Postoperative serum transaminase levels including AST or ALT on postoperative day one (POD1).

Quality assessment / Risk of bias analysis Cochrane Collaboration's tool.

Strategy of data synthesis For NMAs, We used the network meta package in Stata (version 16.1) based on the frequentist model. We did network meta¬ analyses using a random effects model. We estimated summary odds ratios (ORs) for dichotomous outcomes and standardized mean differences (SMD) for continuous outcomes with their 95% CIs using pairwise and network meta analysis. In terms of heterogeneity, we also conducted pairwise meta-analyses to inspect for statistical heterogeneity deriving from different trial designs or different clinical characteristics of study participants by using χ2 test. We assessed inconsistency between direct and indirect sources of evidence using global and local approaches. We assessed global inconsistency by using a design ¬by ¬treatment test. We evaluated local inconsistency by side-splitting approach comparing direct and indirect evidence for each pairwise treatment comparison.

Subgroup analysis Cirrhosis, liver resection, Pringle time.

Sensitivity analysis High risk ,small sample size.

Country(ies) involved China.

Keywords liver resection , ischemic preconditioning.

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