INPLASY PROTOCOL

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Conflicts of interest:
None.

Effects of dexmedetomidine on cognitive function in elderly patients after laparoscopic cholecystectomy: a protocol for systematic review and meta-analysis

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Review question / Objective: **Is dexmedetomidine effective and safety on cognitive function (CF) in elderly patients after laparoscopic cholecystectomy (LCT)?**
Condition being studied: **Dexmedetomidine; cognitive function; AND laparoscopic cholecystectomy.**
Information sources: **The search will be performed in Cochrane Library, MEDLINE, EMBASE, CINAHL, PsycINFO, Scopus databases, VIP database, WANGFANG database, Chinese Biomedical Literature Database, and China National Knowledge Infrastructure. All these electronic databases will be searched from the commencement to the March 31, 2020 with no limitations of language and publication status. We will create a search strategy sample for MEDLINE. We will also present similar search strategies for other electronic databases. Besides the above sources, we will also check grey literature, such as conference abstracts, dissertations, reference lists of included studies and relevant reviews.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 06 April 2020 and was last updated on 06 April 2020 (registration number INPLASY202040030.

INTRODUCTION

Review question / Objective: **Is dexmedetomidine effective and safety on cognitive function (CF) in elderly patients after laparoscopic cholecystectomy (LCT)?**

Condition being studied: **Dexmedetomidine; cognitive function; AND laparoscopic cholecystectomy.**

METHODS

Participant or population: This study will include elderly participants (over 65 years old) who underwent LCT and had CF regardless their countries, races and sex.

Intervention: In the experimental group, all participants received dexmedetomidine intervention for their managements.

Comparator: In the control group, patients underwent any treatments, including anesthetic medication or alternative therapies, except dexmedetomidine.

Study designs to be included: This study will only include randomized controlled trials (RCTs) that investigated the effects of dexmedetomidine on CF in elderly patients after LCT.

Eligibility criteria: This study will only include RCTs that investigated the effects of dexmedetomidine compared with any treatments on CF in elderly patients after LCT.

Information sources: The search will be performed in Cochrane Library, MEDLINE, EMBASE, CINAHL, PsycINFO, Scopus databases, VIP database, WANGFANG database, Chinese Biomedical Literature Database, and China National Knowledge Infrastructure. All these electronic databases will be searched from the commencement to the March 31, 2020 with no limitations of language and publication status. We will create a search strategy sample for MEDLINE. We will also present similar search strategies for other electronic databases. Besides the above sources, we will also check grey literature, such as conference abstracts, dissertations, reference lists of included studies and relevant reviews.

Main outcome(s): The primary outcome includes cognitive disorder changes. It can be assessed by any relevant scales, such as Modified Mental State Examination scale.

Additional outcome(s): The secondary outcomes consist of pain intensity (checked by any pain scales); short-term memory (measured by any associated tools, such as Short-term Memory Summary score); quality of life (assessed by any relevant scales, such as activities of daily living); and adverse events.

Data management: We will create a standardized data collection sheet for data extraction before we perform it. Two authors will independently extract general descriptive data: authors, year of publication, country, language, title, characteristics of patients, diagnostic criteria, inclusion and exclusion criteria, number of patients, study design, study methodology, details of interventions and controls (such as deliver mode, frequency, dosage, duration), outcomes, safety, and any other relevant information. Any divergences occur between two authors regarding the data extraction, and a third author will be invited to resolve these issues by discussion.

Quality assessment / Risk of bias analysis: Risk of bias for each included study will be evaluated by two independent authors using the Cochrane risk of bias tool. It will assess each trial through 7 aspects and each one will be graded as high risk of bias, unclear risk of bias, or low risk of bias. Any opposition between two authors will be solved by a third author through consultation.

Strategy of data synthesis: RevMan 5.3 software will be employed for statistical analysis. We will estimate continuous values (including cognitive disorder changes, pain intensity, short-term memory, and quality of life) as mean difference or standardized mean difference and 95% confidence intervals (CIs), and dichotomous values (including incidence of adverse events) as risk ratio and 95% CIs. We will assess heterogeneity by checking the characteristics of eligible trials, disparities of subjects, types of interventions and comparators, and types of outcomes using I^2 statistics. Its values will be interpreted as follows: 0-50%

represents low heterogeneity; and 51-100% indicates considerable heterogeneity. A fixed-effect model will be used when there is low heterogeneity, while a random-effect model will be applied when there is obvious heterogeneity. If we identify low heterogeneity, we will carry out meta-analysis when sufficient studies involving the same outcome measurements are included, which focus on the similar study and patient characteristics, and interventions and controls. If we investigate considerable heterogeneity, we will carry out subgroup analysis to check the possible reasons for the obvious heterogeneity. Additionally, we will also merge the outcome data and report them as a narrative summary.

Subgroup analysis: When necessary, we will undertake a subgroup analysis to investigate the potential heterogeneity and inconsistency based on the different patient characteristics, study quality, treatments, controls, and outcome measurements.

Sensibility analysis: If necessary, we will also perform a sensitivity analysis to identify the stability of merged outcome data by excluding studies with high risk of bias.

Country(ies) involved: China.

Keywords: Dexmedetomidine; cognitive function; laparoscopic cholecystectomy; elderly patients; effects; safety.