INPLASY PROTOCOL

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Review Stage at time of this submission: **The review has not yet started.**

Conflicts of interest: **No.**

Impact of transcranial doppler sonography for detecting ischemic stroke: a protocol of systematic review and meta-analysis

Liu, WJ; Zhang, YJ[2].

Review question / Objective: **Can transcranial doppler sonography (TDS) detect ischemic stroke (IS)?**
Condition being studied: **Ischemic stroke; transcranial doppler sonography.**
Information sources: **Electronic searches - The following electronic databases will be searched in PUBMED, EMBASE, Cochrane Library, PsycINFO, Cumulative Index to Nursing and Allied Health Literature, Allied and Complementary Medicine Database, WANGFANG, Chinese Biomedical Literature Database, and China National Knowledge In¬frastructure from inception to March 20, 2020 with no limitations of language and publication status. All potential case-controlled studies (CCSs) that examined the impact of TDS for detecting IS will be included. We will build search strategy sample for PUBMED in table 1. We will adapt similar search strategies for other electronic databases. Other resources - We will also identify conference abstracts, websites of clinical registry and reference lists of associated reviews.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 23 April 2020 and was last updated on 23 April 2020 (registration number INPLASY202040155).

INTRODUCTION

Review question / Objective: **Can transcranial doppler sonography (TDS) detect ischemic stroke (IS)?**

Condition being studied: **Ischemic stroke; transcranial doppler sonography.**

METHODS

Participant or population: **All patients who were diagnosed as IS will be included in this study, irrespective their race, age, and severity of IS.**

Intervention: **Index test: Any form of TDS for detection of patients with IS will be included in this study.**

Comparator: **Reference test: All patients with computerized tomography or**

magnetic resonance imaging-proven IS will be included in the control group.

Study designs to be included: This study will include all potential case-controlled studies (CCSs) that investigate the impact of TDS for detecting IS.

Eligibility criteria: This study will include all potential CCSs that investigate the impact of TDS for detecting IS. However, this study will not include animal studies, reviews, case studies, and non-CCSs.

Information sources: Electronic searches - The following electronic databases will be searched in PUBMED, EMBASE, Cochrane Library, PsycINFO, Cumulative Index to Nursing and Allied Health Literature, Allied and Complementary Medicine Database, WANGFANG, Chinese Biomedical Literature Database, and China National Knowledge In¬frastructure from inception to March 20, 2020 with no limitations of language and publication status. All potential case-controlled studies (CCSs) that examined the impact of TDS for detecting IS will be included. We will build search strategy sample for PUBMED in table 1. We will adapt similar search strategies for other electronic databases. Other resources - We will also identify conference abstracts, websites of clinical registry and reference lists of associated reviews.

Main outcome(s): This study comprises of sensitivity, specificity, positive likelihood ratio, negative likelihood ratio, and diagnostic odds ratio.

Data management: Two independent reviewers will independently collect data utilizing a standardized data extraction sheet. If there will be divergences between two reviewers, we will be settled by a third reviewer through discussion. We will collect data of study identification details (such as title, first author, and time of publication), trial design, trial setting, population characteristics (such as age, gender, and diagnostic criteria), details of index and reference tests, outcomes, results, and conclusions.

Quality assessment / Risk of bias analysis: Two reviewers will independently assess study quality using Quality Assessment of Diagnostic Accuracy Studies (QUADAS-2) tool. This tool covers four fields. If there are any conflicts between two reviewers, we will invite a third reviewer to solve them by discussion.

Strategy of data synthesis: This study will apply RevMan V.5.3 software and Stata V.12.0 software to pool the data and to perform statistical analysis. We will use Stata V.12.0 software to estimate sensitivity, specificity, positive likelihood ratio, negative likelihood ratio, and diagnostic odds ratio by using 2 x 2 tables of primary studies. We will estimate outcome data using descriptive statistics and 95% confidence intervals. We will also carry out a descriptive forest plot, and a summary receiver operating characteristic plot. We will check statistical heterogeneity across studies by I2 statistic. I2 ≤ 50% suggests reasonable heterogeneity, and I2 >50% reveals obvious heterogeneity. If $I^2 \leq 50\%$, we will pool the data and will carry out meta-analysis. If $I^2 > 50\%$, we will perform a subgroup analysis and will synthesize data based on the results of subgroup analysis. If we still find considerable heterogeneity after subgroup analysis, we will not pool the data, and meta-analysis will be not undertaken. We will use a bivariate random-effects regression approach to estimate sensitivity and specificity.

Subgroup analysis: We will carry out a subgroup analysis to explore remarkable heterogeneity based on different study and patient characteristics, and index and reference tests.

Sensibility analysis: We will perform a sensitivity analysis to examine the stability of outcome results by deleting low quality studies.

Country(ies) involved: China.

Keywords: Ischemic stroke; transcranial doppler sonography; sensitivity; specificity.