

INPLASY PROTOCOL

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None declared.

Effects of Transcutaneous Electric Acupoint Stimulation (TEAS) on Heart Rate Variability (HRV): a systematic review and meta-analysis

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Review question / Objective: Is Transcutaneous Electric Acupoint Stimulation (TEAS) beneficial for heart rate variability in different populations?

Condition being studied: Transcutaneous Electric Acupoint Stimulation. Heart Rate Variability.

Information sources: PubMed, Embase, Ovid Medline, Cochrane Central Register of Controlled Trials, China Knowledge Network Database (CNKI), WanFang Database (WanFang database), VIP Chinese Science and Technology Journal Database (VIP) and China Biomedical Literature CD-ROM Database (CBM).

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 25 November 2022 and was last updated on 25 November 2022 (registration number INPLASY2022110137).

INTRODUCTION

Review question / Objective: Is Transcutaneous Electric Acupoint Stimulation (TEAS) beneficial for heart rate variability in different populations?

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METHODS

Search strategy: The databases for the literature search include PubMed, Embase, Ovid Medline, Cochrane Central Register of Controlled Trials, China Knowledge Network Database (CNKI), WanFang Database (WanFang database), VIP Chinese Science and Technology Journal Database (VIP) and China Biomedical Literature CD-ROM Database (CBM). The

retrieval time was from the construction of the library to November 2022. We included the following items, #1: “transcutaneous electrical acupoint stimulation” OR “transcutaneous electrical stimulation of acupoints” OR “transcutaneous electrical acupuncture point stimulation” OR “transcutaneous electrical nerve stimulation on acupoints” OR “transcutaneous electric nerve stimulation”; #2: “heart rate variability”; #3: #1 AND #2. The search references were combined in the literature retrieved, and as many relevant studies were obtained as possible.

Participant or population: Adults (aged ≥ 18) were treated with transcutaneous electrical acupoint stimulation.

Intervention: Transcutaneous electrical acupoint stimulation.

Comparator: Blank control, placebo TEAS, crossover, or conventional treatment.

Study designs to be included: Randomized controlled clinical trial (placebo controlled or crossover).

Eligibility criteria: Animal experiments, pharmacological study reports, reviews, empirical summaries and theoretical discussions were excluded.

Information sources: PubMed, Embase, Ovid Medline, Cochrane Central Register of Controlled Trials, China Knowledge Network Database (CNKI), WanFang Database (WanFang database), VIP Chinese Science and Technology Journal Database (VIP) and China Biomedical Literature CD-ROM Database (CBM).

Main outcome(s): Heart rate variability.

Additional outcome(s): Heart rate.

Data management: Two researchers independently screened the literature that met the inclusion criteria and conducted cross-checking. Literature screening was carried out according to the research type, research objects, intervention/control

measures, and outcome indicators. The steps included duplicate checking, primary screening of titles and abstracts, and re-screening of full texts. Two researchers independently extracted relevant data, including author, publication year, sample size, intervention measures, course of treatment, and outcome indicators. After data extraction, two investigators conducted cross-checks. Any disagreements encountered during literature screening or data extraction will be resolved by discussion until consensus is reached or a third investigator is consulted.

Quality assessment / Risk of bias analysis: Two reviewers will independently assess risk of bias based on the following areas as recommended in the Cochrane Handbook: (1) randomization methods; (2) allocation concealment; (3) blinding; (4) whether reviewers were blinded; (5) Whether the outcome data was reported completely; (6) Selective reporting of results; (7) Other bias. If there was any disagreement in the evaluation process, a third researcher was consulted.

Strategy of data synthesis: Enumeration data were expressed as relative risk (RR) and its 95% CI, and measurement data were expressed as weighted mean difference (WMD) or standard mean difference (SMD) and its 95% CI. Due to expected heterogeneity among trials, a summary meta-analysis will be performed using Rev Man 5.4.

Subgroup analysis: First, to assess whether the efficacy of stimulation varies between acupuncture points; second, to investigate whether it is equally effective in different groups.

Sensitivity analysis: If there was no significant difference by the Q test ($p > 0.10$, $I^2 \leq 50\%$), the fixedeffects model was used for the meta-analysis. If there was a significant difference ($p \leq 0.10$ and $I^2 > 50\%$), sensitivity analysis or subgroup analysis was conducted to determine the source of heterogeneity, and the source of heterogeneity was eliminated to check

whether the results were the same. If the heterogeneity test could not be carried out and the source of heterogeneity could not be eliminated, then the statistical heterogeneity between studies was considered too large for a comparative analysis, and only a descriptive analysis was performed.

Country(ies) involved: China.

Keywords: transcutaneous electric acpoint stimulation; heart rate variability; autonomic nervous system; meta-analysis.

Contributions of each author:

Author 1 - Mu-Jiao Zhou.

Author 2 - Yong-Hong Yang.