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Insights into the Cardiovascular Benefits of Taurine: A Study Protocol of Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION

Support - TSUM.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202410074

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 17 January 2024 and was last updated on 17 January 2024.

INTRODUCTION

Review question / Objective The objective of this study is to investigate the treatment effect taurine on cardiovascular diseases (CVDs) related parameters.

Rationale Taurine, a sulfur containing amino acid, has been shown promise in influencing key cardiovascular parameters linked to CVDs, such as heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), left ventricular ejection fraction (LVEF), and New York Heart Association Functional Classification (NYHA). However, due to inconsistent results from various studies, a meta-analysis of randomized controlled trials was conducted to better understand taurine's effectiveness in treating CVDs.

Condition being studied The PICO (population, intervention, comparison, and outcome) settings for this meta-analysis includes: P: human participants, I: taurine supplementation, C: supplementation (including placebo) other than taurine, and O: parameters associated with cardiovascular function.

METHODS

Search strategy Two authors will conduct independent electronic searches in in Embase, PubMed, Web of Science, Cochrane CENTRAL, and ClinicalTrials.gov databases using the following keywords ('taurine' OR 'taufon') AND ('cardiovascular disease' OR 'vascular disease' OR 'hypertension' OR 'blood pressure' OR 'heart failure' OR 'atherosclerosis' OR 'arrhythmia' OR 'coronary heart disease' OR 'peripheral arterial disease').

Participant or population Human participants.

Intervention Taurine supplementation.

Comparator Supplementation (including placebo) other than taurine.

Study designs to be included Randomized controlled trials (RCTs).

Eligibility criteria (1) RCTs involving the use of pure taurine and its compounds as the primary treatment; (2) inclusion of a comparative arm utilizing interventions different from taurine; and (3) trials that offer accessible data for pre- and post-intervention assessments, or evaluations of changes in one or more of the recorded outcomes.

Information sources Two authors will conduct independent electronic searches in in Embase, PubMed, Web of Science, Cochrane CENTRAL, and ClinicalTrials.gov databases using the following keywords ('taurine' OR 'taufon') AND ('cardiovascular disease' OR 'vascular disease' OR 'hypertension' OR 'blood pressure' OR 'heart failure' OR 'atherosclerosis' OR 'arrhythmia' OR 'coronary heart disease' OR 'peripheral arterial disease').

Main outcome(s) The main outcomes assessed in this investigation include: (1) HR, (2) SBP, (3) DBP, (4) LVEF, and (5) NYHA.

Data management Two independent authors extracted data that included outcome values, research design, taurine and controlled regimen details, and demographic information. The evaluators carefully examined the direction of the scale used in each trial to avoid mis-interpretation.

Quality assessment / Risk of bias analysis The Cochrane risk of bias tool for randomized trials (RoB 2, London, United Kingdom) will be used, which includes six main items: the randomization process, intervention adherence, outcome measurement, missing outcome data, selective reporting, and the overall risk of bias.

Strategy of data synthesis A random-effects model will be used to pool the effect size on Comprehensive Meta-Analysis software (version 3, Biostat, Englewood, NJ, United States). A two-tailed p-value of less than 0.05 will be considered statistically significant. Hedges' g will be used to quantify the study outcomes.

Subgroup analysis Not applicable.

Sensitivity analysis To confirm the robustness of the meta-analysis, the sensitivity analyses were performed using one-study removal method to see if there was a significant change in the summary effect size after removing a particular trial from the analysis.

Language restriction No limitation of languages.

Country(ies) involved Taiwan.

Keywords taurine, heart failure, cardiac function, hypertension, nutrition.

Contributions of each author

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