INPLASY PROTOCOL

To cite: Yao et al. The efficacy of angiotensin converting enzyme inhibitors versus angiotensin II receptor blockers on insulin resistance in hypertensive patients: A protocol for a systematic review and Meta-analysis. Inplasy protocol 202050032. doi: 10.37766/inplasy2020.5.0032

Received: 09 May 2020

Published: 09 May 2020

Corresponding author:
Qiu Chen

momeakyrx@163.com

Author Affiliation:
Chengdu University of Traditional Chinese Medicine

Support: **No. 2019YF30085**

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

Conflicts of interest:
All authors report no conflicts of interest in this study.

The efficacy of angiotensin converting enzyme inhibitors versus angiotensin II receptor blockers on insulin resistance in hypertensive patients: A protocol for a systematic review and Meta-analysis

Yao, J[1]; Gong, X[2]; Shi, X[3]; Fan, S[4]; Chen, J[5]; Chen, Q[6].

Review question / Objective: **This study aims to use systematic review and meta-analysis to evaluate the efficacy of angiotensin converting enzyme inhibitors versus angiotensin II receptor blockers on insulin resistance in hypertensive patients.**
Condition being studied: **Recent studies have demonstrated that hypertension and diabetes exhibit high comorbidity, and the development of hypertension is regarded as an early indicator of abnormal glucose metabolism. People with hypertension have a high prevalence of insulin resistance and are of relatively higher risk of developing type 2 diabetes mellitus. Indeed, the management and treatment costs of a hypertensive patient with diabetes are far greater compared with a non-diabetic patient. To our knowledge, the various antihypertensive drugs have different effect on glucose metabolism. However, there are insufficient data from evidence based medicine on the comparison of ARBs and ACEI in terms of their effect on the insulin resistance. This study aims to use systematic review and meta-analysis to objectively evaluate the efficacy of angiotensin converting enzyme inhibitors versus angiotensin II receptor blockers on insulin resistance in hypertensive patients, so as to provide an objective basis for the treatment of this disease in clinical practice.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 09 May 2020 and was last updated on 09 May 2020 (registration number INPLASY202050032).

INTRODUCTION

Review question / Objective: **This study aims to use systematic review and meta-analysis to evaluate the efficacy of angiotensin converting enzyme inhibitors versus angiotensin II receptor blockers on insulin resistance in hypertensive patients.**

Condition being studied: Recent studies have demonstrated that hypertension and diabetes exhibit high comorbidity, and the development of hypertension is regarded as an early indicator of abnormal glucose metabolism. People with hypertension have a high prevalence of insulin resistance and are of relatively higher risk of developing type 2 diabetes mellitus. Indeed, the management and treatment costs of a hypertensive patient with diabetes are far greater compared with a non-diabetic patient. To our knowledge, the various antihypertensive drugs have different effect on glucose metabolism. However, there are insufficient data from evidence based medicine on the comparison of ARBs and ACEI in terms of their effect on the insulin resistance. This study aims to use systematic review and meta-analysis to objectively evaluate the efficacy of angiotensin converting enzyme inhibitors versus angiotensin II receptor blockers on insulin resistance in hypertensive patients, so as to provide an objective basis for the treatment of this disease in clinical practice.

METHODS

Search strategy: Eight databases will be searched including PubMed, the Cochrane Library, EMBASE, Web of Science, China National Knowledge Infrastructure (CNKI), VIP Database for Chinese Technical Periodicals, Chinese Biomedical Literature Database (CBM) and WanFang Data. The ClinicalTrials.gov registry will be also searched for unpublished trials. Relevant references from included studies will be sought to retrieve additional eligible studies. No limits will be set on language, publication year or type of publication.

Participant or population: Hypertensive patients.

Intervention: Angiotensin converting enzyme inhibitors.

Comparator: Angiotensin II receptor blockers.

Study designs to be included: RCTs.

Eligibility criteria: i) RCTs with any follow-up duration and sample size; ii) Participants studied had a diagnosis of hypertention; iii) Angiotensin converting enzyme inhibitors should be applied in participants as an intervention at any dose, the control group should be applied in participants as angiotensin II receptor blockers; iv) Reported quantitative outcomes.

Information sources: Databases including Medline, the Cochrane Library, EMBASE, Web of Science and Cochrane Central Register of Controlled Trials (CENTRAL) will be searched. The ClinicalTrials.gov registry was also searched for unpublished trials and authors were contacted for additional information if necessary. Relevant references from included studies were sought to retrieve additional eligible studies. No limits were set on language, publication date and type.

Main outcome(s): HOMA-IR index, glucose infusion rate(GIR), Quantitative Insulin-Sensitivity Check Index (QUICKI), fasting plasma glucose (FPG) and fasting plasma insulin (FPI).

Additional outcome(s): Systolic blood pressure (SBP) and diastolic blood pressure (DBP).

Quality assessment / Risk of bias analysis: Based on the Cochrane Handbook for Systematic Reviews (version 5.1.0), we will assess the methodological quality of all studies. The risks of bias will be classified as low, unclear, or high by evaluating the 7 components as random sequence generation, allocation concealment, blinding of outcome assessment, blinding of participants and personnel, incomplete outcome data, selective outcome reporting, and other bias. Two independent reviewers (JY and XYG) will conduct this assessment, and a third reviewer (XYS) will be consulted for any disagreements.

Strategy of data synthesis: Stata 12.0 software will be used for statistical analysis. Dichotomous data will be expressed as the odds ratio (OR) with a 95% confidence interval (CI), and

continuous data will be presented as the mean difference (MD) with 95% CI. P<0.05 will be considered to indicate a statistically significant result.

Subgroup analysis: **We will conduct subgroup analysis according to the following factors if there were adequate studies: duration, dose, gender, age, et al.**

Sensibility analysis: **Sensitivity analysis will be used to observe changes in the pooled effect size and heterogeneity between included studies, to assess the reliability and stability of the pooled results.**

Language: **No language limits will be imposed on the search.**

Country(ies) involved: **China.**

Keywords: **Angiotensin converting enzyme inhibitors, angiotensin receptor blockers, insulin resistance , blood pressure, hypertension, meta-analysis.**

Contributions of each author:
Author 1 - Jia Yao.
Author 2 - Xiayu Gong.
Author 3 - Xiaoyan Shi.
Author 4 - Simin Fan.
Author 5 - Junmin Chen.
Author 6 - Qiu Chen.