INPLASY PROTOCOL

To cite: Liu et al. Effects of COVID-19 on the blood glucose of diabetic patients a protocol for systematic review and meta-analysis. Inplasy protocol 202060114. doi: 10.37766/inplasy2020.6.0114

Received: 30 June 2020

Published: 30 June 2020

Corresponding author:
Yan Liu

liuxiaoyangas@163.com

Author Affiliation:
Affiliated Hospital of Chengdu University of TCM.

Support: **NSFC,Youth Fund,No. 81904082.**

Review Stage at time of this submission: **Preliminary searches.**

Conflicts of interest: **No.**

Effects of COVID-19 on the blood glucose of diabetic patients a protocol for systematic review and meta-analysis

Liu, Y[1]; Yang, Y[2]; Chen, Y[3]; Xie, C[4]; Liu, X[5]; Zhou, L[6].

Review question / Objective: **Study design. Our research will include Case-control studies. However, repeated publications of the same study; articles on research in pediatric populations (17 years of age or younger); letters, abstracts, reviews, or animal experiments are excluded. Participants.We will include adult patients diagnosed with diabetes, including patients co-infected with COVID-19.Interventions. Diabetics diagnosed with COVID-19 are in the experimental group, while diabetes patients without COVID-19 are in the control group. Both groups are cured with conventional diabetes treatments recommended by the American Diabetes Association (ADA) guidelines, including diet, exercise, and hypoglycemic and lipid-lowering therapies. The experimental group receives conventional COVID-19 treatment, and the control group receives placebo or no treatment. Outcomes. The primary outcomes include fasting blood glucose, 2-hour postprandial blood glucose, glycated hemoglobin and fasting insulin.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 30 June 2020 and was last updated on 30 June 2020 (registration number INPLASY202060114).

INTRODUCTION

Review question / Objective: **Study design. Our research will include Case-control studies.However, repeated publications of the same study; articles on research in pediatric populations (17 years of age or younger); letters, abstracts, reviews, or animal experiments are excluded. Participants. We will include adult patients diagnosed with diabetes, including patients co-infected with COVID-19. Interventions. Diabetics diagnosed with COVID-19 are in**

the experimental group, while diabetes patients without COVID-19 are in the control group.Both groups are cured with conventional diabetes treatments recommended by the American Diabetes Association (ADA) guidelines, including diet, exercise, and hypoglycemic and lipid-lowering therapies.The experimental group receives conventional COVID-19 treatment, and the control group receives placebo or no treatment.Outcomes. The primary outcomes include fasting blood glucose, 2-hour postprandial blood glucose, glycated hemoglobin and fasting insulin.

Condition being studied: Coronaviruses (CoVs) are an enveloped single-stranded RNA virus. COVID-19 has the characteristics of high prevalence and high infectivity. At the time of writing, COVID-19 has caused 10,420,325 infections and 508,467 deaths in the worldwide. Diabetes mellitus (DM) is a common chronic metabolic disease, accompanied by multiple organ damage and functional decline. COVID-19 is generally susceptible around the world, but diabetic patients often have multiple chronic diseases and the body's immune response capacity is reduced, which is a high-risk group susceptible to infect by this virus. According to the current published articles, the proportion of diabetes in COVID-19 patients is 10.1%-20.0%, and the proportion of diabetes in critically ill COVID-19 patients is 22.2% .A study reported that SARS-CoV-2 can invade cells by binding to the receptor of angiotensin converting enzyme 2 (ACE2). Previous studies have found that in addition to human respiratory and lung tissues, ACE2 is also expressed in pancreatic endocrine tissues. Therefore, it is speculated that the pancreas may also be the target organ for 2019 new coronavirus attack. The disease factors of elevated blood glucose in COVID -19 patients may COVID-19 highly bind to the ACE2 receptor in islet cells, causing islet cell damage.

METHODS

Participant or population: We included adult patients diagnosed with diabetes.

Intervention: Diabetics diagnosed with COVID-19 were in the experimental group, while diabetes patients without COVID-19 were in the control group. Both groups were cured with conventional diabetes treatments recommended by the American Diabetes Association (ADA) guidelines, including diet, exercise, and hypoglycemic and lipid-lowering therapies. The experimental group received conventional COVID-19 treatment, and the control group received placebo or no treatment.

Comparator: Diabetics diagnosed with COVID-19 were in the experimental group, while diabetes patients without COVID-19 were in the control group.

Study designs to be included: Our research will include Case-control studies.

Eligibility criteria: Our research will include Case-control studies, and adult patients diagnosed with diabetes, including patients co-infected with COVID-19.However, repeated publications of the same study; articles on research in pediatric populations (17 years of age or younger); letters, abstracts, reviews, or animal experiments are excluded.

Information sources: We will retrieve each database from the built-in database until August 2020. Chinese literature comes from CNKI, Wanfang, VIP, and CBM databases. English literature mainly searches Cochrane Library, PubMed, Web of Science, and EMBASE. We adopt the combination of heading terms and free words as search strategy, which decided by all the reviewers. Search terms: 2019-nCoV, nCoV-2019, novel Coronavirus 2019, SARS-CoV-2, COVID-19, coronavirus, coronavirus covid-19, and corona virus, diabetes mellitus, diabetes, diabetic.At the same time, we will retrieve other resources to complete the deficiencies of the electronic databases, mainly searching for the clinical trial registries and gray

literature about DSD for diabetes and COVID-19 on the corresponding website.

Main outcome(s): The primary outcomes include fasting blood glucose, 2-hour postprandial blood glucose, glycated hemoglobin and fasting insulin.

Quality assessment / Risk of bias analysis: The investigator will evaluate all included studies in accordance with the guidelines of the Cochrane Handbook for Systematic Reviews of Interventions.The following items related to the risk of bias, including random sequence generation, allocation concealment, blind participants and personnel, blind assessment of results, incomplete result data, selective result reports, and other biases, will be evaluated by two reviewers. The quality of each trial is classified as "low", "high",or "unclear" risk of bias. The discrepancies will get a consistent conclusion by discussing between both reviewers or seeking the third-party consultation.

Strategy of data synthesis: We will use Review Manager software version 5.3 provided by Cochrane Collaboration to analyze the data. The RR of 95% CI is used to summarize the dichotomous data. Continuous data will be summarized by using the weighted MD of 95% CI. According to research recommendations, we will use a random effect model (REM) for meta-analysis in this paper. Statistical heterogeneity will be evaluated by Chi-square test and I2 test. P≥0.01 and I250% indicate that the study has no significant statistical heterogeneity. In contrast, P50%, indicating that there is considerable heterogeneity. When there is no statistical heterogeneity, a fixed effect model (FEM) will be used. In contrast, when there is a statistical heterogeneity, a REM will be used. In addition, we will conduct subgroup or sensitivity analysis to find potential causes. If meta-analysis cannot be performed, we will conduct a descriptive analysis.

Subgroup analysis: We will divide the diabetic patients into the experimental group and the control group according to whether they have COVID-19 infection or not, and then conduct subgroup analysis based on different reasons such as age, gender, different forms of intervention, treatment process, etc.

Sensibility analysis: To evaluate the robustness of the meta-analysis results, we will first delete the low-quality studies and then merge the data to assess the impact of the sample size, study quality, statistical methods, and missing data on the metaanalysis results.

Country(ies) involved: No country restrictions.

Keywords: COVID-19, diabetes mellitus, meta-analysis, protocol, systematic review

Contributions of each author:
Author 1 - Yan Liu - Author 1 drafted the manuscript.
Author 2 - Yan Yang.
Author 3 - Yalin Chen.
Author 4 - Chunguang Xie.
Author 5 - Xuehui Liu.
Author 6 - Linyue Zhou.