INPLASY PROTOCOL

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None declared.

Association between diabetes mellitus and no-reflow/slow-flow phenomenon in patients with ST-elevation myocardial infarction undergoing percutaneous coronary intervention: a systematic review and meta-analysis

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Review question / Objective: **To explore the relationship between DM and no reflow/slow-flow phenomenon in patients with ST-elevation myocardial infarction (STEMI) who are undergoing percutaneous coronary intervention (PCI).**
Condition being studied: **We searched PubMed, Embase, Cochrane Library from establishment of the database to November 2021. The search terms are mainly: "Diabetes Mellitus" "No-Reflow Phenomenon" "No Reflow Phenomenon" "Slow-Flow Phenomenon" "Slow Flow Phenomenon" "ST Elevation Myocardial Infarction" "ST Segment Elevation Myocardial Infarction" "ST Elevated Myocardial Infarction" "STEMI" "Percutaneous Coronary Intervention" "Percutaneous Coronary Interventions" "Percutaneous Coronary Revascularization".**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 November 2021 and was last updated on 13 November 2021 (registration number INPLASY2021110044).

INTRODUCTION

Review question / Objective: **To explore the relationship between DM and no reflow/slow-flow phenomenon in patients with ST-elevation myocardial infarction (STEMI) who are undergoing percutaneous coronary intervention (PCI).**

Condition being studied: **Percutaneous coronary intervention (PCI) has been established as the most effective**

management strategy to restore antegrade blood flow in ST-elevation myocardial infarction (STEMI). However, even if complete revascularization is achieved, it may not be able to maintain sufficient reperfusion of the myocardium as shown by angiography. Previous studies have found that the prevalence of no-reflow/slow-flow in all patient undergoing PCI is 2-3.2%. Because no-reflow/slow-flow phenomenon is related to advanced heart failure, malignant arrhythmia and long-term mortality, it has received extensive clinical attention . It is reported that the absence of reflux is mainly related to coronary artery constriction or spasm and atherosclerotic plaque embolism. Other studies have shown that patients with type 2 diabetes mellitus (T2DM) complicated with acute myocardial infarction have severe glucose metabolism disorder, resulting in impaired arterial endothelial function and increased atherosclerotic lesions. Therefore, it is speculated that the absence of reflux after PCI is associated with T2DM to a certain extent. It is necessary for us to prevent the occurrence of no-reflow/slow-flow phenomenon by identifying the causes of this phenomenon and clinical conditions that can predict no-reflow/slow-flow. Although some independent risk factors for no-reflow/slow-flow phenomenon, such as distal embolization, vasospasm, microvascular damage, oxidative stress, and ischemia-reperfusion injury have been discovered , but the predisposing factors for the no reflow/slow-flow phenomenon are still not thoroughly understood. Increasing studies have found that the incidence of no-reflow/slow-flow phenomenon in diabetes mellitus (DM) patients has increased significantly. However, there was no difference in the incidence of diabetic between normal flow and no-reflow groups. Another study also showed that the incidence of DM between normal flow and no-reflow groups was similar. Since controversy still exists, Since controversy still exists, this meta-analysis aims to explore the relationship between DM and no reflow/slow-flow phenomenon in patients with STEMI who are undergoing PCI through evidence-based medicine, so as to better prevent no reflow/slow-flow phenomenon.

METHODS

Search strategy: We searched PubMed, Embase, Cochrane Library from establishment of the database to November 2021. The search terms are mainly: “Diabetes Mellitus” “No-Reflow Phenomenon” “No Reflow Phenomenon” “Slow-Flow Phenomenon” “Slow Flow Phenomenon” “ST Elevation Myocardial Infarction” “ST Segment Elevation Myocardial Infarction” “ST Elevated Myocardial Infarction” “STEMI” “Percutaneous Coronary Intervention” “Percutaneous Coronary Interventions” “Percutaneous Coronary Revascularization”.

Participant or population: Diabetes mellitus and no-reflow phenomenon in patients with ST-elevation myocardial infarction Percutaneous coronary intervention in patients with ST-segment elevation myocardial infarction.

Intervention: No.

Comparator: Diabetes mellitus and slow reflow phenomenon in patients with ST-elevation myocardial infarction.

Study designs to be included: Cohort study

Eligibility criteria: The inclusion criteria were as follows: the study type is cross-sectional study; the language is limited to English.Exclusion criteria: duplicate publication; research without full text, incomplete information or inability to conduct data extraction; animal experiments; reviews and systematic reviews.

Information sources: we searched PubMed, Embase, Cochrane Library from establishment of the database to November 2021. The search terms are mainly: “Diabetes Mellitus” “No-Reflow Phenomenon” “No Reflow Phenomenon” “Slow-Flow Phenomenon” “Slow Flow Phenomenon” “ST Elevation Myocardial

Infarction" "ST Segment Elevation Myocardial Infarction" "ST Elevated Myocardial Infarction" "STEMI" "Percutaneous Coronary Intervention" "Percutaneous Coronary Interventions" "Percutaneous Coronary Revascularization".

Main outcome(s): Outcome was age, gender, BMI, hypertension and diabetes.

Quality assessment / Risk of bias analysis: Two researchers independently conducted literature quality evaluations using the Agency for Healthcare Research and Quality (AHRQ) Quality Assessment Tool for cross-sectional study. When the opinions are inconsistent, it is decided through discussion or consultation with the third person. The meta-analysis was performed based on the related items of the Preferred Reporting Items for Systematic Reviews and Meta-analysis statement (PRISMA statement).

Strategy of data synthesis: STATA 15.1 was used to analyze the data. OR (95%CI) was used to analysis the risk factors of no-reflow/slow-flow. I2 is used to evaluate heterogeneity. If the heterogeneity test is P≥0.1 and I2≤50%, it indicates that there is homogeneity between studies, and the fixed effects model is used for combined analysis; if P50%, it indicates that the study If there is heterogeneity, use sensitivity analysis to find the source of heterogeneity. If the heterogeneity is still large, use the random effects model or give up the combination of results and use descriptive analysis. Funnel plot and Egger's test was used to analyze publication bias.

Subgroup analysis: Subgroup analysis included different clinical outcomes, different study populations, different diagnostic criteria, different follow-up time.

Sensitivity analysis: Sensitivity analysis eliminates each included study one by one, and performs a summary analysis on the remaining studies to assess whether a single included study has an excessive impact on the results of the entire meta-analysis.

Language: English.

Country(ies) involved: China.

Keywords: diabetes mellitus; no-reflow/slow-flow; ST-elevation myocardial infarction; percutaneous coronary intervention; Meta-analysis.

Contributions of each author:

Author 1 - Zhifeng Bai - Performed the experiments and analyzed the data and wrote original draft.
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