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**ADMINISTRATIVE INFORMATION****Support** - None.**Review Stage at time of this submission** - Data analysis.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY2023110073**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 November 2023 and was last updated on 18 November 2023.**INTRODUCTION**

**Review question / Objective** To explore the correlation between diabetes mellitus (DM) and artery stiffness measured by carotid femoral pulse wave velocity (cf-PWV).

**Condition being studied** Diabetes mellitus (DM) is one of the most common chronic disease in the world, and is also one of the independent risk factors of cardiovascular events [1]. The major reason contributes to that is DM accelerates the development of arterial stiffness (AS) and thickness, thus leading to the increased risk of coronary artery disease and/or stroke [2]. Lots of studies have confirmed the relationship between DM and AS. However, the indicators they once usually used were intima-media thickness (IMT), augmentation index (AIx) and pulse wave velocity (PWV). Of them, PWV is currently assumed as most accurate [3]. According to the different recording sites, PWV can be divided into carotid-

femoral PWV (cf-PWV), carotid-radial PWV (cr-PWV), brachial-ankle PWV (ba-PWV), and so on. Different types reflect their relevant arteries' stiffness. For example, cf-PWV reflects the stiffness of central artery, cr-PWV reflects the peripheral artery and ba-PWV reflects both central and peripheral arteries.

Recent studies have certified cf-PWV has a more significant clinical value, e.g., cf-PWV could be established as a predictor of future cardiovascular events. Besides, some researchers restarted to analyze the association between AS and DM with cf-PWV. However, there has been not a meta-analysis summarizing these studies by far. This present study aims at settling this issue so as to provide further insights for clinical practice.

**METHODS**

**Participant or population** Populations with diabetes.

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**Intervention** Artery stiffness.

**Comparator** cf-PWV.

**Study designs to be included** Case control study.

**Eligibility criteria** Studies comparing cf-PWV between DM and non-DM populations were considered to be enrolled.

**Information sources** Databases of Pubmed, Ovid Medline, Web of science, Embase, CNKI, and Wanfang.

**Main outcome(s)** Primary endpoints: cf-PWV, defined as the ratio of the surface distance between the carotidsternal notch and the femoral notch and wave transit time, regardless of any measurement method.

Secondary endpoints: (1) cr-PWV; (2) cIMT. cr-PWV was defined as the ratio of the surface distance between the carotidsternal notch and the radial notch and wave transit time. cIMT was defined as the intima-media thickness of the carotid artery.

**Quality assessment / Risk of bias analysis** The quality of observational studies was assessed with the Newcastle-Ottawa Quality Assessment Scale.

**Strategy of data synthesis** with the software of STATA 17.0.

**Subgroup analysis** Not applicable.

**Sensitivity analysis** Sensitivity analysis was performed to select the origin of heterogeneity.

**Country(ies) involved** China.

**Keywords** artery stiffness, cf-PWV, Diabetes mellitus, meta-analysis, systematic review.

#### **Contributions of each author**

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