INPLASY PROTOCOL

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Review Stage at time of this submission: Preliminary searches.

Conflicts of interest: None declared.

Associating Abdominal Obesity with Diabetic Retinopathy in Patients with Diabetes Mellitus: Systematic Review and Meta-analysis

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Review question / Objective: Is there an association between abdominal obesity and diabetic retinopathy in patients with diabetes mellitus?

Condition being studied: The association between BMI and diabetic retinopathy (DR) has been well studied. However, in recent years, clinical researchers have reported conflicting results about the association between independent abdominal obesity and DR in DM patients. Some studies claim that DM patients with abdominal obesity have an increased risk of DR compared to general obesity as measured by BMI. However, Wan, H et al concluded that abdominal obesity did not associate with DR. Meanwhile, a clinical study by Wu, J et al reported that abdominal obesity, as assessed by the lipid accumulation index LAP, was negatively associated with DR. Therefore, it is necessary to further clarify the relationship between abdominal obesity and DR in patients with type 1 and type 2 diabetes.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 14 May 2022 and was last updated on 14 May 2022 (registration number INPLASY202250091).

INTRODUCTION

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abdominal obesity did not associate with DR. Meanwhile, a clinical study by Wu, J et al reported that abdominal obesity, as assessed by the lipid accumulation index LAP, was negatively associated with DR. Therefore, it is necessary to further clarify the relationship between abdominal obesity and DR in patients with type 1 and type 2 diabetes.

METHODS

Search strategy: We will search PubMed, Web of Science and Embase databases up to May 1, 2022, for observational studies that investigated the association between abdominal obesity and DR in patients with diabetes mellitus. The search strategy will include the following terms: abdominal obesity, central obesity, visceral obesity, visceral fat, anthropometry, waist, diabetic retinopathy, diabetic eye diseases, retinal photographs, optical coherence tomography and diabetic patients. The search process will perform independently by two authors (SF and LZ).

Participant or population: Patients with a confirmed diagnosis of type 1 or type 2 diabetes.

Intervention: The review will not include follow-up data from interventional studies. The review will focus on studies investigating the association between abdominal obesity and DR in DM patients.

Comparator: Not applicable.

Study designs to be included: Observational studies (cohort, cross-sectional and case-control studies).

Eligibility criteria: Eligible studies had to meet the following criteria: (1) were original observational (cross-sectional, case-control or cohort) studies; (2) explicitly stated the definition and graded diagnostic criteria of diabetic retinopathy; (3) specifically described the measurement or calculation of abdominal obesity parameters, including WC, WHR, WHtR, VFA, LAP and VAI; (4) evaluated the associations between abdominal obesity

and DR in patients with T1DM or T2DM; (5) reported the mean ± SD. Studies were excluded if they: (1) were animal experiments, case reports, editorials, comments, or literature reviews; (2) repeated reports of the same data in different forms; (3) contained incomplete data which was still unavailable after contact with the author.

Information sources: PubMed, Web of Science and Embase databases, contact with authors, trial registers and grey literature.

Main outcome(s): The main outcome is the association between diabetic retinopathy and abdominal obesity, evaluated by different parameters including WC waist circumference, WHR waist-hip ratio, WHtR waist-height ratio, VFA visceral fat area, LAP lipid accumulation product, VAI visceral adiposity index.

Quality assessment / Risk of bias analysis: The Agency for Healthcare Research and Quality (AHRQ) recommended criteria will be used for evaluating cross-sectional studies' quality. The quality of case-control and cohort studies will be assessed by the Newcastle-Ottawa Scale (NOS). Publication bias will be evaluated by visual inspection of funnel plot asymmetry, supplemented by the Egger regression test. While the number of theoretically missing studies will be estimated by the trim-and-fill method.

Strategy of data synthesis: Continuous variables will be presented as mean ± SD, and SMD with 95% CI were calculated. The I2 statistic was used to test for the heterogeneity across studies. A fixed-effect model was used for I2 < 50%, whereas random-effect models were used for I2 ≥ 50%. In this study, we will use the Stata 16.0 (Stata Corporation, College Station, TX, USA) to perform data analyses. A p value of < 0.05 is considered statistically significant.

Subgroup analysis: To explore potential sources of heterogeneity among the included studies, a considerable number of

prespecified subgroup analyses will be conducted based on ethnicity, diabetic retinopathy severity and parameters of abdominal obesity.

Sensitivity analysis: Additionally, sensitivity analyses will be attempted to identify potential sources of the heterogeneity.

Language: No limitation.

Country(ies) involved: China.

Keywords: Abdominal obesity; Diabetic Retinopathy; Diabetes · Meta-analysis.

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