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Association between Circulating CTRP9 and Coronary Artery Disease: A Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 14 May 2024 and was last updated on 14 May 2024.

INTRODUCTION

Review question / Objective The aim of this meta-analysis was to re-examine the relationship between circulating CTRP9 levels and CAD. The population we chose were adults with or without complications who developed CAD. Articles reporting circulating level of CTRP9 in patients with CAD served as intervention. Comparison groups consisted of adults without CAD during the same period. Assessing circulating level of CTRP9 in individuals with CAD compared to control groups served as an outcome measure.

Condition being studied Coronary artery disease (CAD) is a prevalent condition among elderly individuals in China. It is a chronic inflammatory response disease of arterial intima initiated by lipid entry. During early stages of atherosclerosis, monocytes aggregate, adhere and migrate to the subendothelial layer of the intima where they differentiate into macrophages and finally foam cells. Subsequently, atherosclerotic plaques are formed. Biomarkers play a critical role in definition, prognostication and decision-making regarding cardiovascular events management. Currently, the commonly used biomarkers for CAD include cardiac troponin (cTn), creatine kinase MB (CK-MB), brain natriuretic peptide (BNP), C-reactive protein (CRP) and etc. However, their prognostic value is limited when assessing future development of cardiovascular disease. Therefore, there is a need for new biomarkers that are more sensitive and accurate for early diagnosis of CAD. Numerous reports have indicated that low CTRP9 levels can serve as an independent risk factor for CAD, but conflicting results regarding the association between circulating levels of CTRP9 and CAD have emerged.

METHODS

Participant or population Adults with or without complications who developed CAD.

Intervention Articles reporting circulating level of CTRP9 in patients with CAD served as intervention.

Comparator Comparison groups consisted of adults without CAD during the same period.

Study designs to be included Assessing circulating level of CTRP9 in individuals with CAD compared to control groups served as an outcome measure.

Eligibility criteria Articles lacking valid data, duplicate publications and withdrawn articles were excluded.

Information sources The following databases were searched for relevant studies: PubMed, Web of Science, Embase, Cochrane Library, CNKI, VIP, Wan fang Data and CBM.

Main outcome(s) Assessing circulating level of CTRP9 in individuals with CAD compared to control groups served as an outcome measure.

Quality assessment / Risk of bias analysis The risk and bias of all selected studies were evaluated using the Newcastle Ottawa Scale (NOS).

Strategy of data synthesis Mean and standard deviation (SD) were used to describe the data extracted from the studies, and standardized mean differences (SMDs) with 95% CI were chosen to express the continuous variable data. The Q-test and I2 statistic were employed for heterogeneity testing. An I2 value of less than 50% indicated no statistical heterogeneity, in which case a fixed effects model was applied for calculation. A p-value greater than 0.05 was considered statistically significant in our analysis. All statistic analysis were performed using Review Manager 5.3.

Subgroup analysis Subgroup analysis would be conducted based on the following five aspects if high heterogeneity existed: (1) the main characteristics of articles (year of publication, study area, patients' age and BMI); (2) complications (diabetes or type 2 diabetes mellitus (T2DM)); (3) relevant clinical biochemical indicators (triglyceride (TG), low-density lipoprotein (LDL) and high-density lipoprotein (HDL)); (4) coronary artery lesion (stability of coronary atherosclerotic plaque and the number of diseased coronary vessels); (5) classification of CAD (UAP, SAP, AMI). If the heterogeneity within each subgroup was evidently lower than the overall heterogeneity, it was considered as a potential source of heterogeneity.

Sensitivity analysis We conducted leave-1-out sensitivity analysis by excluding each study one by one to observe any alteration of the direction of SMDs. A p-value greater than 0.05 was considered statistically significant in our analysis.

Country(ies) involved China.

Keywords CTRP9, coronary artery disease, meta-analysis.

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