INPLASY

Prognostic value of lectin-like oxidized LDL receptor-1 for future CVD risk and outcome: Systematic review and meta-analysis

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Aminuddin, A; Samah, N; Che Roos, NA; Mohamad, SF; Beh BC; Hamid, AA; Ugusman, A.

Corresponding author:
Amilia Aminuddin

amilia@ppukm.ukm.edu.my

Author Affiliation:
Universiti Kebangsaan Malaysia.

ADMINISTRATIVE INFORMATION

Support - GUP-2024-030.

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2024120078

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 December 2024 and was last updated on 18 December 2024.

INTRODUCTION

Review question / Objective The study aims to determine the prognostic value of soluble LOX-1 for future CVD risk and outcome. P: Individuals at risk of or diagnosed with cardiovascular disease. I: Elevated sLOX-1 levels or measurements of sLOX-1. C: Low sLOX-1 levels. O: Cardiovascular events (MACCE/MI/HF/ recurrent stroke) or mortality.

Rationale 1) There is growing evidence suggests sLOX-1 could be a valuable predictor of future CVD events.
2) The overall consistency and strength of the associations between sLOX-1 and future CVD remain unclear.
3) There is no meta-analysis has been conducted on the prognostic impact of sLOX-1 and future CVD risk.
4) This review will provide a comprehensive and quantitative assessment on the association, heterogeneity, and role of sLOX-1 in cardiovascular risk stratification.

Condition being studied Studies that measure sLOX-1 and risk of the outcome (MACCE/MI/HF/ recurrent stroke) among adult human CAD and stroke patients, both male and female regardless of ethnicity were included.

METHODS

Search strategy The literature search was conducted through four internet databases (Ovid, Pubmed, Scopus, and Google scholar) and only studies that were published from 2014 until October 2024 were included. The keywords that were used for the search were: (“Lox-1” OR “lectin-like oxidized LDL receptor-1”) AND (“Cardiovascular disease” OR “CVD” OR “Coronary artery disease” OR “CAD” OR “Myocardial infarction” OR “Acute coronary syndrome” OR “Atherosclerosis” OR “Peripheral vascular disease” OR “Cerebrovascular accident” OR “Stroke” OR “Major cardiovascular event” OR “MACE” OR “Mortality”).

Participant or population Patients diagnosed with coronary artery disease (CAD), including acute coronary syndrome (ACS), myocardial infarction (MI), ST-elevation myocardial infarction (STEMI), heart failure (HF), major adverse cardiovascular events (MACE), acute ischemic stroke (AIS), transient ischemic attack (TIA). Normal healthy people also will be included.

Intervention Elevated sLOX-1 levels or measurement of sLOX-1 level among patients with coronary artery disease and stroke.

Comparator Comparison between low sLOX-1 and high sLOX-1 levels.

Study designs to be included Cohort human study (prospective and retrospective).

Eligibility criteria Inclusion criteria: : (1) full-text peer-reviewed original articles published in English, (2) both prospective and retrospective studies investigating the relationship between sLOX-1 and future coronary artery disease (CAD), cardiovascular disease (CVD), or major adverse cardiovascular events (MACEs), and (3) clinical studies involving adult patients diagnosed with acute coronary syndrome (ACS), CAD, or acute ischemic stroke (AIS), regardless of gender. The exclusion criteria consisted of: (1) original articles not published in English, (2) reviews, conference abstracts, editorials, newsletters, books, and book chapters, (3) in vitro studies, and (4) research involving animals.

Information sources The articles were searched from online databases through the UKM Library Website. Then, the articles were downloaded and exported into the Mendeley for the screening phase.

Main outcome(s) 1) Association between sLOX-1 and future cardiovascular events. 2) Association between sLOX-1 and future recurrent stroke or unfavorable outcomes post-stroke.

Data management Not applicable.

Quality assessment / Risk of bias analysis Two reviewers (NS and AA) independently evaluated the risk of bias in the selected articles. The Newcastle–Ottawa Scale (NOS) was employed to systematically assess the quality of risk of bias for each article. In cohort studies, there are three domains that NOS assessed. NOS examined the selection of study groups (exposed and non-exposed), comparability between groups, and the outcome assessment. In each three domains, there are eight items could receive a star rating, with each item awarded a minimum of one star and a maximum of two stars. Studies that received a total score of seven to nine stars were classified as high quality, those with four to six stars as fair quality, and those with one to three stars as low quality.

Strategy of data synthesis After searching articles using the online databases, article selection and data extraction were conducted, The article selection process consisted of three stages. First, articles were screened according to their titles and types, with review or editorial articles excluded. Next, abstracts were examined to remove any articles that were not relevant to sLOX-1 and coronary artery disease (CAD), cardiovascular disease (CVD), or major adverse cardiovascular events (MACEs). Finally, the remaining articles underwent a detailed full-text review, and those that did not satisfy the inclusion criteria were eliminated. For data extraction, two researchers (AA and NS) independently gathered information, including the study's first author, study design, population characteristics such as age and gender, methods of sLOX-1 measurement, and the future CVD risk reported. These information will be tabulated in a table. For relevant data, a meta-analysis will be conducted using Review Manager (RevMan) 5.4 software (The Cochrane Collaboration 2020). The hazard ratio (HR) and its 95% confidence interval (CI), derives from multivariate Cox proportional hazard analysis, will be utilized as the effect estimate to assess the role of s-LOX-1 as a predictor of major adverse cardiovascular events (MACEs) in patients with acute coronary syndrome (ACS) or acute ischemic stroke (AIS). The heterogeneity among studies will be assessed using (1) the Chi-squared test, with a p-value of less than 0.10 indicating statistical significance, and (2) the Higgin's I^2 statistic [Higgins]. An I^2 value of less than 25% will be considered to indicate low heterogeneity, while an I^2 value of 75% or greater was deemed high heterogeneity.

Subgroup analysis Not applicable.

Sensitivity analysis Random effect will be used.

Language restriction English.

Country(ies) involved Malaysia.

Other relevant information Not applicable.

Keywords Cardiovascular disease; coronary artery disease; acute coronary syndrome; myocardial

infarction; major cardiovascular event; stroke; soluble lectin-like oxidized LDL (sLOX-1).

Dissemination plans Not applicable.

Contributions of each author

Author 1 - Amilia Aminuddin - Conduct the conceptualization, methodology (article selection, data extraction, and risk analysis), writing original draft, and editing.
Email: amilia@ppukm.ukm.edu.my
Author 2 - Nazirah Samah - Conduct the methodology (literature search, article selection, data extraction, and risk analysis), writing-review, editing and formatting.
Email: nazirahsamah97@gmail.com
Author 3 - Nur Aishah Che Roos - Conduct the methodology (meta-analysis), writing-review and editing.
Email: nuraishah@upnm.edu.my
Author 4 - Shawal Faizal Mohamad - Writing-review.
Email: superwall81@hotmail.com
Author 5 - Boon Cong Beh - Writing-review.
Email: dr.behbooncong@ppukm.ukm.edu.my
Author 6 - Adila A. Hamid - Conduct writing-review, editing and validation.
Email: adilahamid@ppukm.ukm.edu.my
Author 7 - Azizah Ugusman - Conduct writing-review, editing and validation.
Email: dr.azizah@ppukm.ukm.edu.my