Association of diabetes with atrial fibrillation types: Protocol for a systematic review and meta-analysis

Review question

Our systematic review aims to summarize the evidence regarding the association of diabetes with AF types, in humans. In order to provide insights concerning the role of diabetes on the pathophysiology of AF, we will also perform a meta-analysis on the association of diabetes with the likelihood of having non-paroxysmal AF rather than paroxysmal AF.

Searches

An expert medical librarian will perform the search on the following bibliographic electronic databases: Embase, Medline Ovid, Cochrane Central, Web of Science Core Collection, and Google Scholar. There will be no language or date restrictions.

Types of study to be included

Inclusion criteria

(i) Studies in humans
(ii) Observational studies, including cross-sectional studies, prospective studies, case-control studies, nested case-control, nested case-cohort studies
(iii) Studies that investigated the association of diabetes with the likelihood of having a certain AF type rather than another AF type
(iv) Studies providing information on effect estimates (risk ratio, hazard ratio [HR], odds ratio [OR]) with 95% confidence intervals [95% CI] or p-values
(v) No restrictions on publication year or language.

Exclusion criteria

Animal studies, reviews, meta-analyses, conference abstracts, conference proceedings, poster presentations, case-series, and letters to editor.

Condition or domain being studied

Diabetes mellitus, atrial fibrillation, atrial fibrillation types, including paroxysmal, persistent, long-standing persistent, permanent AF.

Participants/population

Population with data available on diabetes and atrial fibrillation types

Exposure

Diabetes

Comparator

No diabetes

Main outcome(s)

Atrial fibrillation types

Data extraction (selection and coding)

This systematic review will be conducted following a recently published guide on how to perform a systematic review and meta-analysis; and will be reported following the the

Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) recommendations. Two reviewers will independently screen the selected citations by title and abstract. Furthermore, the reviewers will independently evaluate the full texts of relevant articles. In case of disagreement between the reviewers regarding inclusion, a decision will be made by consensus or a third reviewer will be consulted. The reference list of included articles will be hand searched to identify additional studies. A predesigned data collection form will be used to extract relevant information from the selected studies, including first author`s last name, year of publication, country where the study was conducted, study population, number of participants at baseline, mean age, percentage of women, diabetes assessment, adjustments for potential confounders, outcome, follow-up time, and risk estimates with 95% CI.

Risk of bias (quality) assessment

The quality of the included studies will be assessed separately by two reviewers using the Newcastle–Ottawa Scale (NOS) for non-randomized studies. The NOS scale evaluates the study quality based on 3 domains, namely selection of participants, comparability of study groups, and ascertainment of the outcomes of interest, with a maximum of nine stars for every study assessed.

Strategy for data synthesis

We will provide a narrrative synthesis of the findings of eligible studies. The studies classifying AF types into paroxysmal (reference) and non-paroxysmal will be included in the meta-analysis, if applicable. The effect estimates on the association of diabetes with the likelihood of non-paroxysmal AF (vs paroxysmal AF) will be pooled, using random effects models as described by DerSimonian and Laird. Forest plots will be constructed. Heterogeneity will be assessed by using the I^2 statistic, with $I^2 \leq 25\%$ considered as low, $25\% < I^2 < 75\%$ as moderate, and $I^2 \geq 75\%$ as high. If applicable, we will use funnel plots and Egger regression symmetry tests to evaluate the possibility of publication bias. Statistical analyses will be performed using Stata IC version 15.1 (StataCorp LLC, Texas, USA)

Analysis of subgroups or subsets

Sensitivity analyses will be performed whenever appropriate. To evaluate the role of individual studies on the overall results, we will recalculate the estimates after removing the studies one by one from the pooled analysis. Moreover, we will restrict the analysis to studies that define AF types in accordance with the guidelines.

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Type and method of review
Systematic review, meta-analysis

Funding sources/sponsors
None

Conflicts of interest
None

Language
English

Country
Switzerland

Stage of review
Ongoing

Subject index terms
Diabetes mellitus; atrial fibrillation; paroxysmal, non-paroxysmal, persistent, permanent.