Moderate alcohol consumption and lipoprotein subfractions: a systematic review of intervention and observational studies

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INTRODUCTION

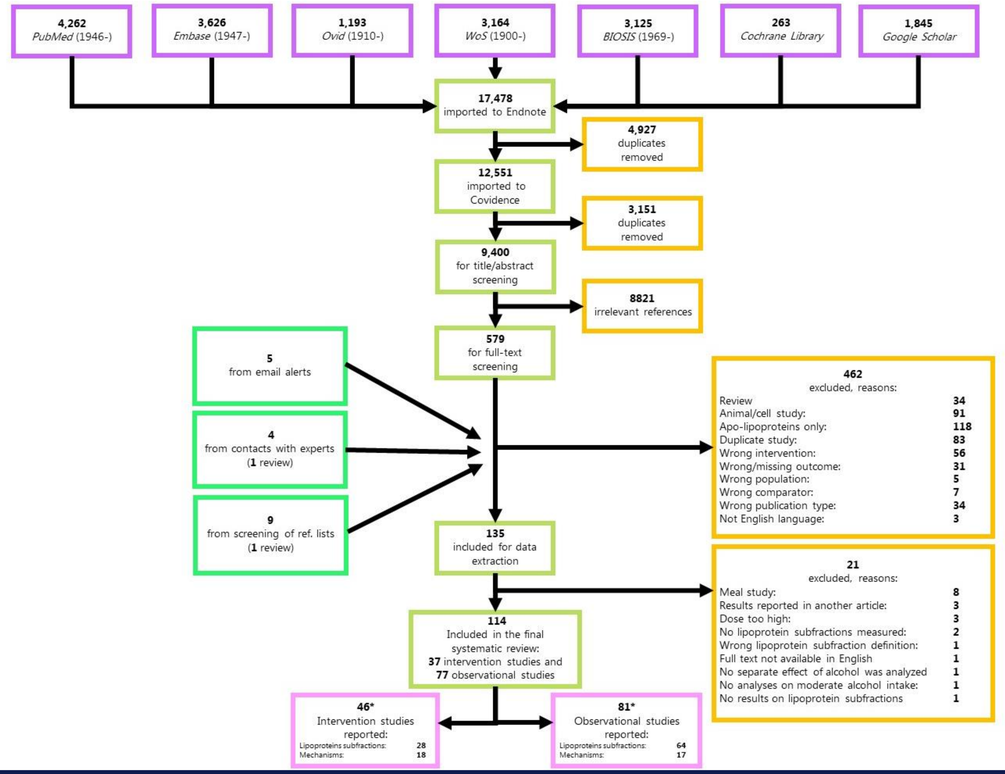
Moderate alcohol consumption is associated with decreased risk of cardiovascular disease and improvement in cardiovascular risk markers, including lipoproteins,[1,2] and lipoprotein subfractions.[3–5] Changes in lipoprotein subclasses could mediate the potential beneficial effects of moderate drinking on cardiovascular health.

AIM

This study aimed to systematically review the relationship between moderate alcohol intake, lipoprotein subfractions, and related mechanisms. Secondarily, to investigate whether results differed by study design and subject health status.

METHOD

This review followed the PRISMA guidelines. Studies with alcohol intake at doses up to 60 g/d were included from nine scientific databases. Lipoprotein subfractions and related mechanisms were examined. Eligible studies were human and *ex vivo* studies in all kinds of study designs, populations, and publication years. The last search was performed in March 2021, and clinicaltrials.gov was screened for unpublished literature. Risk of bias was assessed with three tools according to study design.



RESULTS

We included 37 intervention studies and 77 observational studies with a total of 20,510 and 104,773 participants, respectively. Most intervention studies provided an alcohol dose between 20 to 40 g per day. Alcohol intake was positively related to all HDL subfractions measured, independent of study design. Studies on the effects of alcohol on LDL and VLDL subfractions were limited. However, some studies of varying design found lower levels of small LDL particles, increased LDL particle size, and complex, non-linear relationships to apoB-containing particles. We also identified hypothesis generating results on the associations of alcohol with lipoprotein subfractions defined by the content of the pro-atherogenic apoC-III. In addition, cholesterol efflux capacity and paraoxonase activity were consistently increased across studies. Most studies included healthy subjects or populations of mixed health status. Several studies were graded to have unclear or high risk of bias, and heterogeneous laboratory methods restricted comparability between them.

CONCLUSIONS

Alcohol intake in doses up to 60 g/day can cause changes in lipoprotein subfractions, such as increased HDL subfractions and decreased smaller LDL particles, which may relate to cardiovascular health. Future studies should investigate effects on apoB-containing lipoproteins and novel biomarkers such as HDL subfractions defined by apolipoproteins like apoC-III. This review is registered at http://www.crd.york.ac.uk/prospero/, no.: 98955.

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