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Moderate beer consumption does not change early or mature atherosclerosis in mice

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Abstract

Background

Although the consumption of wine in particular has been associated with a lower risk of atherothrombotic cardiovascular disease, systematic reviews differ as to the relative protective effect of beer, wine and spirits. Two previous studies showed that red wine reduces fatty streak formation (early atherosclerosis) but not mature atherosclerosis in apolipoprotein (apo) E-deficient (apoE^{-/-}) mice.

Aim of the study

To determine whether a moderate beer intake would affect early and mature atherosclerotic lesion formation using control C57BL/6 and apoE^{-/-} mice, respectively, as models.

Methods

Control C57BL/6 and apoE^{-/-} mice were randomized to receive either water, ethanol, mild beer, dark beer or ethanol-free beer. The level of beer was designed to approximate the alcohol intake currently believed to be beneficial in reducing human vascular risk. Control C57BL/6 mice were fed a Western diet for 24 weeks, and apoE^{-/-} mice a chow diet for 12 weeks. At the end of the trial period, mice were euthanized and atherosclerotic lesions quantified. Plasma lipid concentrations were also measured.

Results

The amount of atherosclerosis and average number of lesions in the proximal aortic region did not differ among groups in control C57BL/6 mice (p = 0.32 and p = 0.29, respectively) and apoE^{-/-} mice (p = 0.19 and p = 0.59, respectively). No consistent differences were observed in plasma lipid and lipoprotein concentrations among water, ethanol and beer groups.

Conclusions

Moderate beer consumption does not change the development of early or mature atherosclerosis in mice. Our findings

do not support the hypothesis of an anti-atherogenic effect of beer. Other potential protective actions of moderate beer consumption such as plaque stabilization, a reduction in plaque intrinsic thrombogenicity, or a reduction in the systemic propensity to thrombosis, remain to be studied.



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