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Light to moderate alcohol consumption and acute myocardial infarction, heart failure and atrial fibrillation

AKADEMISK AVHANDLING

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ABSTRACT

Background and aim: A large number of studies found an inverse association between light to moderate alcohol consumption and the risk of acute myocardial infarction (AMI) and heart failure (HF). Whether this consumption is associated with the risk of atrial fibrillation (AF) is less clear. Methodological shortcomings may limit causal inference in these studies, most importantly the “sick-quitter” bias and the confounding by social factors. Furthermore, how drinking frequency, binge- and problem drinking or beverage types may influence these associations is not well understood. The overall aim of this thesis is to contribute to a better understanding of the prospective associations between light-to-moderate alcohol intake and the risk of AMI, HF and AF by addressing the above described unresolved issues.

Methods and results: The Nord-Trøndelag Health Study (HUNT) is a large Norwegian population-based study conducted in three waves. For study I and II, we used data from HUNT2 conducted in 1995 -1997. In HUNT2, 65 215 individuals (70% of the eligible) participated and were followed for AMI and HF. For study III and IV, HUNT3 conducted in 2006-2008, was used: 50 807 individuals (54% of the eligible) participated and were followed for AF. In study III, 1 266 healthy individuals were selected randomly from HUNT3 and had an echocardiography examination.

The quantity, type and frequency of alcohol consumption were ascertained by questionnaires. Binge drinking, i.e. drinking \geq five glasses in one sitting and problem drinking were assessed. To identify abstainers who were former drinkers, information from the preceding waves of HUNT, i.e. HUNT1 or HUNT2 were used. They were categorized as long-term abstainers, abstainers who were former drinkers, rare drinkers, and drinkers, who were further categorized based on average alcohol consumption in a two-week period. Information on socioeconomic position, demographics, smoking, physical activity, common chronic conditions, and anxiety and depression symptoms were assessed, and anthropometrics, blood pressure and blood lipids were measured.

The average alcohol consumption in the HUNT was 3-4 grams per day. The quantity of alcohol consumption was inversely associated with the risk of AMI and HF (study I, II). There was no clinically meaningful association between light to moderate alcohol intake and LV function (study III). Compared to abstainers, drinkers who consumed over seven drinks per week had an increased risk of AF. However, when we excluded those who consumed alcohol over the recommended limits, i.e., $>$ seven drinks per week for women and >14 drinks per week for men and reported binge and/or problem drinking the attributable risk of alcohol consumption was negligible in this low-drinking population (study IV). Frequent, more evenly distributed alcohol consumption was more protective for AMI and HF than less frequent intake of the same quantity (study I, II). Among binge and/or problem drinkers, alcohol consumption was associated with a slightly increased risk of HF and worse LV structural characteristics (study II, III).

Conclusions: Light to moderate alcohol consumption, within the recommended limits was associated with a reduced risk of AMI and HF, but not with the risk of AF. While frequent low-level consumption is associated with the lowest risk of AMI and HF, binge drinking seems to be harmful even if the average alcohol intake is moderate. Alcohol consumption within the recommended limits may provide some cardiovascular benefits without increasing the risk of AF.