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Advantages and Disadvantages of Alcohol Intake on Cardiovascular Health Reviewed CME/CE

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September 4, 2007 — The latest American Heart Association guidelines caution people not to start drinking alcohol if they do not already drink alcohol, according to a review of the advantages and disadvantages of alcohol intake on cardiovascular health published in the August 23 Online First issue of the *Journal of the American College of Cardiology*.

"Accumulating scientific evidence indicates that light to moderate drinking done on a daily basis may significantly reduce the risks of coronary heart disease (CHD) and all-cause mortality," write James H. O'Keefe, MD, FACC, and colleagues from the Mid America Heart Institute in Kansas City, Missouri. "In contrast, excessive alcohol intake and binge drinking are toxic to both the heart and overall health and are the third leading cause of premature death among Americans. The purpose of the present review is to: 1) outline the specific benefits and risks of alcohol, and the threshold of intake at which drinking becomes a health danger rather than an advantage; 2) detail the mechanisms whereby alcohol confers cardioprotection; and 3) discuss the ideal quantities, drinking patterns, and beverages, and which individuals are most likely to benefit."

Research to date has shown J-shaped relationships between alcohol consumption and several adverse health outcomes, including all-cause mortality, CHD, diabetes, hypertension, congestive heart failure, stroke, dementia, and Raynaud's phenomenon.

Some cardioprotective benefits have been demonstrated for light to moderate alcohol consumption (up to 1 drink daily for women and 1 or 2 drinks daily for men). Most studies have shown that light to moderate drinking is associated with risk reductions for CHD of approximately 30% to 35%.

Alcohol consumed in moderation seems to have an antiatherosclerotic effect, with decreased incidence of peripheral arterial disease and decreased atherosclerotic burden shown by coronary angiography, computerized tomography-detected coronary calcium, and carotid ultrasound.

Like exercise, alcohol consumption seems to be most cardioprotective when done daily and in moderation. However, increasingly excessive consumption is associated with proportional worsening of outcomes.

Because of the beneficial effects on high-density lipoprotein (HDL) cholesterol, insulin action, and inflammation, light to moderate alcohol intake may be particularly helpful for patients with abnormal glucose metabolism and/or insulin resistance. Light to moderate

alcohol intake may be associated with reductions in the prevalence and incidence of diabetes, and a large meta-analysis with 12-year follow-up showed a 30% reduction in new diabetes in those who consumed 1 to 2 drinks daily.

The cardiovascular benefits associated with alcohol consumption protection are thought to be mediated by improvements in insulin sensitivity and HDL cholesterol. The major protective component seems to be the ethanol itself, and not the other ingredients found in different types of alcoholic beverages.

In a meta-analysis incorporating data from more than 1 million participants, consumption of 1 drink daily by women and 1 or 2 drinks daily by men was associated with an 18% reduction in total mortality, but daily intakes of more than 2 drinks in women and 3 drinks in men were associated with dose-dependent increased mortality.

Although low-dose, daily alcohol consumption has been linked to better health than less frequent use, binge drinking increases cardiovascular events and mortality, even in otherwise light drinkers.

"Alcohol should not be universally prescribed for health enhancement to nondrinking individuals owing to the lack of randomized outcome data and the potential for problem drinking," the study authors note. "Alcohol (ethanol) consumption is analogous to the proverbial double-edged sword, and perhaps no other factor in cardiovascular (CV) health is capable of cutting so deeply in either direction depending on how it is used."

Guidelines from the United Kingdom suggest that middle-aged or elderly men and postmenopausal women who drink seldom or never might consider the possibility that light drinking would benefit their health. On occasion, the reviewers have made a similar recommendation to patients who do not smoke and who have no personal or family history of substance abuse and no history of depression or bipolar disorder. However, they argue that light to moderate drinking should not be universally recommended to the general public or even to patients with cardiovascular disease.

As an analogy, they point out that observational data and findings from randomized trials using surrogate endpoints suggested that hormone replacement therapy for women and antioxidant vitamins improved cardiovascular outcomes, whereas later randomized trials with larger samples led to the opposite conclusions. They note that no randomized trials of alcohol for improving clinical outcomes have yet been performed. In observational studies, residual unmeasured confounding factors could be contributing to apparent benefits that seem to be associated with light to moderate drinking.

The investigators further note that heavy drinking has caused significant individual and societal problems and morbidity. In the past 15 years, the rates of alcohol abuse and binge drinking have been increasing, according to the findings of some studies. Alcohol abuse causes 100,000 deaths each year in the United States, and it has been deemed the third largest preventable cause of death. Excessive alcohol consumption has been associated with increased risks for all-cause mortality, motor vehicle crashes, stroke, cardiomyopathy, cardiac dysrhythmia, sudden cardiac arrest, suicide, cancer (particularly of the breast and gastrointestinal tract), cirrhosis, fetal alcohol syndrome, and sleep apnea.

"Sobering statistics warn that moderate daily drinking is a slippery slope that many individuals cannot safely navigate," the study authors conclude. "The latest American Heart Association guidelines caution people not to start drinking if they do not already drink alcohol, because it is not possible to predict in which people alcohol abuse will become a problem. Until we have more randomized outcome data, and tools for predicting susceptibility to problem drinking, it would seem prudent to encourage physicians and patients to focus on more innocuous interventions to prevent CHD."

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Learning Objectives for This Educational Activity

Upon completion of this activity, participants will be able to:

1. Describe mechanisms by which regular alcohol consumption may reduce the risk for cardiovascular disease.
2. Identify the effects of alcohol on cardiovascular health and recommendations for the routine use of alcohol to prevent cardiovascular disease.

Clinical Context

Alcohol may improve the risk for cardiovascular disease through increasing the concentration of HDL cholesterol. Alcohol seems to increase HDL cholesterol in a dose-dependent fashion, with an average increase of 5% in HDL cholesterol among adults who consume 1 alcoholic beverage per day vs adults who abstain. In addition, alcohol can improve insulin sensitivity, particularly when consumed immediately before or during eating. Finally, alcohol can reduce intravascular inflammation and abdominal obesity, both of which promote cardiovascular events.

The current review by O'Keefe and colleagues describes the evidence for alcohol in improving cardiovascular health.

Study Highlights

- In general, alcohol consumption creates a J-shaped curve in terms of the risk for myocardial infarction and total mortality. Consumption of 1 drink daily in women and 1 to 2 drinks daily in men has been demonstrated to reduce rates of total mortality by 18% vs abstinence, although the risk for mortality rises with heavy use of alcohol. Light to moderate drinking also reduces the risk for CHD events by 30% to 35% vs abstinence.
- Alcohol use seems effective in reducing cardiovascular outcomes regardless of sex or age. Even among men with a healthy lifestyle, alcohol can reduce the risk for myocardial infarction by up to 50%.
- Light to moderate alcohol consumption seems to be beneficial among patients with hypertension, although alcohol can increase blood pressure in a dose-dependent fashion, and heavier drinking may be particularly harmful for these patients. Alcohol also seems to reduce the risk for CHD among patients with diabetes.
- Alcohol use also creates a J-shaped curve with regard to the risk for stroke and dementia, and alcohol consumption has been associated with a reduced risk for peripheral arterial disease.
- Alcohol may also improve other significant cardiovascular risk factors. Drinking 1 to 2 alcoholic beverages per day can reduce the incidence of diabetes by 30%, and regular light alcohol consumption also reduces the risk of developing the metabolic syndrome.
- It seems that the ethanol itself, rather than the type of drink consumed, is the component most responsible for the health benefits of alcoholic beverages.
- Despite the benefits of light to moderate alcohol consumption, binge drinking is associated with a 2-fold increase in the risk for myocardial infarction and mortality vs with abstinence from alcohol. Therefore, the most cardiovascular protection seems to be derived from 1 drink per day among women and 1 to 2 drinks per day among men.
- Nonetheless, the study authors do not recommend regular use of alcohol to prevent cardiovascular disease. They note that alcohol abuse is the third leading cause of preventable death in the United States and that encouraging regular use of alcohol may contribute more cases to this already significant problem.

Pearls for Practice

- Alcohol can improve cardiovascular outcomes primarily by increasing HDL cholesterol and improving insulin sensitivity and abdominal obesity.
- The current review suggests that light to moderate use of alcohol can help improve rates of total mortality, myocardial infarction, stroke, peripheral arterial disease, diabetes, and the metabolic syndrome. However, because of the high rate of preventable deaths associated with alcohol use, the study authors recommend against the universal prescription of alcohol consumption.

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Goal

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