Alcohol and Cardiovascular Health-The Razor-Sharp Double-Edged Sword

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Disclosures
None on this topic!
It has long been recognized that the problems with alcohol relate not to the use of a bad thing, but to the abuse of a good thing.”

- Abraham Lincoln
Alcohol is a Razor Sharp, Double Edged Sword

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. 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.

Supporting Heart Health

- Most studies report J-shaped curves, whereby light to moderate drinkers have less risk than abstainers, and heavy drinkers are at the highest risk.
- There are J-shaped associations between alcohol intake and a variety of adverse health outcomes, including:
  - coronary heart disease, diabetes, hypertension, congestive heart failure, stroke, dementia, Raynaud’s phenomenon, and all-cause mortality.
- A recent meta-analysis of over 1 million individuals showed that consumption of 1 drink daily by women and 1 or 2 drinks daily by men was associated with a reduction in total mortality of 18%.

How Alcohol Supports Heart Health

Alcohol consumption confers cardiovascular protection through:
- Improvements in insulin sensitivity and high-density lipoprotein cholesterol.
- The ethanol itself, rather than specific components of various alcoholic beverages, appears to be the major factor in conferring health benefits.
- Improvements in inflammation and abdominal obesity may also be playing lesser roles in the apparent alcohol-related cardio protection.
Interesting Findings

- Health Professionals Follow-Up Study
  - Alcohol intake of 8,867 men (mean age 57 years)
  - Followed all 4 of the major healthy lifestyle behaviors:
    - abstention from smoking
    - maintaining a body mass index <25 kg/m²
    - exercising at least 30 min daily
    - eating a healthy diet
  - That study found that even in men who were already following a very healthy lifestyle, the consumption of 1 or 2 drinks per day was associated with a 40% to 50% decreased risk of myocardial infarction.

- Light to moderate alcohol intake is associated with reductions in both the prevalence and incidence of diabetes.
  - A large meta-analysis of 370,000 individuals followed for 12 years showed a 30% reduction in new diabetes in people who consumed 1 to 2 drinks per day.

Alcohol and Mortality


Alcohol and Cardiovascular Disease

Alcohol and Cardiovascular Disease

Mukamal KK et al. JACC 2010;55:1328-1335

Alcohol and Coronary Artery Disease

Hvidtfeldt UA et al. Circulation 2010;121:1589-1597

Alcohol and CVD-Mycardial Infarction

Alcohol and Hypertension


Alcohol and Ischemic Stroke

Sacco RL et al. JAMA 1999;28: 53-60

Alcohol and New-Onset Diabetes

Alcohol and Cardiovascular Disease

- Decreased HDL
- Increased LDL particle size
- Reduced vascular reactivity
- Increased hypercoagulability
- Adiponectin ↓
- Postprandial glucose ↑

Krenz M et al. J Mol Cell Cardiol 2012;52: 93-104

Alcohol and Atrial Fibrillation

Relative risk of AF

- Men
- Women
- Reference group (non-drinkers)


Alcohol and the Heart

- Ejection Fraction (%)
- Controls
- Alcoholism

Urbano-Marquez et al. 1989
Alcohol and LV Function

Urbano-Marquez et al., 1989

Total Lifetime Dose of Alcohol (kg/kg of Body Weight)

Ejection Fraction (%)

$r = -0.58$

$p < 0.001$

Alcohol and the Heart

Urbano-Marquez et al., 1989

Total Lifetime Dose of Alcohol (kg/kg of Body Weight)

LV Mass (gm/m² of surface area)

$r = 0.585$

$p < 0.001$

Alcohol Abuse and Cardiac Disease

Urbano-Marquez et al., 1989

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Alcohol Abuse and Cardiovascular Disease


Alcohol Consumption and Cardiac Disease

Where Are We Now?

Michael D. Singer, MD, MPA, and C. Daniel, MD

In this issue of the Journal, Whitman et al. (1) emphasized a continuous relationship between alcohol consumption, cardiovascular disease, and public policy. Alcohol consumption is a major public health concern, contributing to significant cardiovascular disease burden. Public health professionals are encouraged to address alcohol consumption in their efforts to reduce cardiovascular disease.

The relationship between alcohol consumption and cardiovascular disease is complex. Light and moderate drinking may modestly reduce cardiovascular risk, while heavy drinking is associated with increased risk. However, individual risk factors, such as age, gender, and overall health, also play a significant role.

Public health interventions aimed at reducing alcohol consumption can be effective in lowering cardiovascular disease rates. Education programs, policies, and interventions targeting high-risk populations are crucial in addressing this public health issue.

References:

Alcohol and Cardiovascular Disease

• Relationship with CHD is “U-shaped”
• Raises HDL-C, especially HDL₃
• Increases arterial pressure (> 2 oz/d)
• Moderate to heavy intake is an independent risk factor for CVA, especially hemorrhagic stroke

Alcohol and CAD

• Moderate alcohol (1-3 drinks/day) is associated with 40-50% less CAD (especially MI & sudden death)
• Half of decrease is due to increase in HDL
• Wine (more so red) is better in some, but not all, studies
• Red wine and red grape juice have antiplatelet, antioxidant, and anti-endothelin-1 effects

Alcohol: A slippery slope

• Excess alcohol #3 cause of premature death
• Kills > 100,000 Americans yearly
• Binge drinking is on the rise, especially among 15 to 30 year olds

“All things in moderation; including moderation.”

Mark Twain

“I limit myself to 1 glass of wine daily!”

One Drink = 13 to 15g of Alcohol
What is the Healthier Choice: Wine or Beer?

Most studies show equal protection from all types of alcohol. Red wine has been shown to have higher levels of bioflavonoids (with antioxidant, antiplatelet, and antiendothelin-1 effects) compared with white wine and other forms of alcohol.

While beer has varying components like hops and barley that are not present in wine. The added benefits include ingredients like:

- B vitamins or folates, which have been shown to reduce homocysteine levels in the blood and reduce heart disease risk.
- Hops used in brewing also contain phytoestrogens, which help prevent bone loss.

Take Home Message

- I rarely make the recommendation to patients well known to me who have no personal or family history of substance abuse, have no history of depression or bipolar disorder, and are nonsmokers to increase alcohol. However, light to moderate drinking cannot be universally recommended to the general public or even patients with CV disease.
- 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.

Alcohol and Cardiovascular Disease

Conclusions

- Mild to moderate alcohol intake appears to confer some protection against CHD
- Potential harmful effects preclude the routine recommendation to increase ETOH consumption
- Drinkers should limit intake to 1 oz/d (2 oz whiskey, 8 oz wine, 24 oz beer)
- Wine potentially may be preferable to other forms of alcohol in health enhancement
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