Cardiovascular benefit of light to moderate alcohol consumption

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BACKGROUND In recent years strong epidemiological evidence has arisen associating significant cardiovascular benefit with light to moderate alcohol consumption. Increased benefit in high cardiovascular risk individuals has been particularly evident. With Australian levels of obesity and type 2 diabetes now reaching epidemic proportions, lifestyle factors that can reduce cardiovascular risk are of critical importance.
OBJECTIVE This article aims to inform general practitioners of the potential cardiovascular benefit of light to moderate alcohol consumption.
DISCUSSION In offering tailored alcohol advice to patients, the GP should have two goals: to minimise harm and maximise benefit. Blanket discouragement of all levels of alcohol consumption can no longer be justified.

Definitions used within this article

Excessive alcohol intake:[1] greater than four drinks per day (40 g) in men and two drinks per day (20 g) in women.

Light to moderate alcohol intake: less than excessive and at least one drink per week.

Epidemiological review

Mortality

Light to moderate alcohol consumption among the middle aged and elderly has consistently been found to reduce all cause mortality.[2–5] The British Doctors Study reported a U-shaped relationship between all cause mortality and alcohol consumption with the lowest mortality in men drinking 1–2 units of alcohol per day.[2] Likewise, the US Cancer Prevention Study II has shown mortality to be lowest in both men and women consuming one alcoholic drink per day.[2] Reduced cardiovascular related death appears most responsible, with consumers of at least one alcoholic drink per day showing 30–40% lower cardiovascular mortality than nondrinkers. Significantly, subjects assessed to have higher baseline cardiovascular risk appear to experience greatest benefit from alcohol consumption.

Myocardial infarction

Much of the decreased mortality can be explained by reduced incidence of myocardial infarction. Analysis of data from 22 071 apparently healthy men in the US Physicians Health Study revealed that, compared to men consuming less than one alcoholic drink per week, those consuming one drink per day were less likely to suffer angina (RR: 0.69, CI: 0.58–0.81) and myocardial infarct (RR: 0.65, CI: 0.52–0.81).[6] High cardiovascular risk patients appeared to benefit most. Both the physicians study and the Nurses Health Study found moderate consuming type 2 diabetics have a greater than 50% reduced risk of myocardial infarction.[7,8]

Type 2 diabetes

Light to moderate alcohol intake appears not only to reduce myocardial infarction in type 2 diabetics but may also reduce the risk of developing type 2 diabetes.[9,10] The Physicians Health Study has shown the risk of developing diabetes over 5.5 years to be over 40% lower in those consuming one or more alcoholic drinks per day (RR: 0.57, CI: 0.45–0.73).[9] Very similar risk reduction has also been reported in women participating in the Nurses Health Study who consumed 5.1–10.0 g of alcohol per day (RR: 0.56, CI: 0.48–0.65).[10] Excessive consumption however, appears to

Table 1. Effects of light to moderate alcohol consumption in the middle aged and elderly

- Reduced all cause mortality
- Reduced cardiovascular mortality
- Reduced incidence of myocardial infarction
- Reduced incidence of type 2 diabetes
- Reduced incidence of stroke (mainly ischaemic)
- Reduced incidence of congestive heart failure

Table 2. Potential cardioprotective mechanisms of alcohol

- Increased HDL-cholesterol
- Decreased triglyceride
- Increased insulin sensitivity
- Reduced thrombotic risk
- Reduced homocysteine
- Beneficial weight distribution

increase risk or at least negate benefit.[11,12]

Stroke

Several studies have now associated light to moderate alcohol consumption with reduced incidence of stroke. In a study of 7273 middle aged British men, nondrinkers had significantly higher risk of stroke than occasional consumers (RR: 1.6, CI: 1.0–2.7).[13,14] The US physician data has shown those consuming at least one alcoholic drink per week to be at reduced risk of stroke than those consuming less (RR: 0.79, CI: 0.66–0.94).[9] Importantly, benefit appeared largely confined to ischaemic stroke (not haemorrhagic) and occasional consumption was enough to achieve benefit. Excessive consumption however, clearly increases stroke incidence.

Congestive heart failure

Although excessive alcohol consumption may lead to cardiomyopathy and heart failure, light to moderate consumption appears to reduce heart failure risk. In a 14 year study of 2235 elderly persons those consuming 21–70 oz of alcohol per month experienced significantly reduced risk of heart failure (RR: 0.53, CI: 0.32–0.88).[15] Similarly, data from participants in the Framingham Heart Study have shown the congestive heart failure risk in nondrinkers to be more than twice that of men consuming 8–14 alcoholic drinks per week and women consuming 3–7 drinks per week (Table 1).[16]

What produces the cardiovascular benefit?

Dyslipidaemia, insulin resistance, hypertension and central obesity are each major determinants of cardiovascular risk. Associations between these factors and alcohol are essential in understanding how benefits are produced.

Table 3. Medical conditions and light to moderate alcohol consumption

May be helpful in	May cause problems in
• the severely obese	• pregnant women
• those at high risk of type 2 diabetes	• those at risk of substance abuse
• those who suffer type 2 diabetes	• medical conditions exacerbated by alcohol
• those who suffer angina	• women with PH or FH of breast cancer
• those who have suffered myocardial infarction	• people taking medications where alcohol is contraindicated
• those who have suffered stroke (ischaemic)	

Dyslipidaemia

Light to moderate alcohol intake appears to be associated with higher HDL cholesterol (HDL-C) and lower triglyceride concentrations. In a study of 1048 middle aged British women, consumers of 1–20 g of alcohol per day had significantly higher plasma concentrations of HDL-C than nondrinkers (difference 0.09 mmol/L, CI: 0.03–0.15) and lower concentrations of plasma triglycerides (difference 0.19 mmol/L, CI: 0.07–0.35).[17] Dietary intervention studies have shown beneficial lipid changes with alcohol consumption in as little as three months.[18] Overall, 50% of the coronary risk reduction associated with alcohol can be attributed to changes in HDL-C.[19]

Insulin resistance

Alcohol consumption appears to be associated with improved insulin sensitivity. A study involving Swedish men aged 58 years recently observed a positive relationship between insulin sensitivity and alcohol consumption.[20] Furthermore, an eight week randomised controlled crossover trial in postmenopausal women has demonstrated 30 g of alcohol per day to have beneficial effects on insulin concentrations and insulin sensitivity.[21] These findings help explain the reduced incidence of type 2 diabetes observed in drinkers, and also offer a potential mechanism for the lipid changes discussed earlier.

Central obesity

Light to moderate alcohol consumption may favorably influence body weight. A 10 year follow up of 7230 women from the NHANES I examination (1971–1975) found that alcohol consumers were 2.3 kg lighter than nonconsumers at baseline and had greater weight stability over 10 years.[22] Alcohol consuming men enrolled in the Boston normative aging study had lower gains in waist to hip ratio (a measure of central obesity) than nondrinkers over 15 years.[23] We have also recently reported that alcohol consumers have greater weight loss at one year after gastric restrictive surgery.[24]

Other factors

The cardiovascular benefit of alcohol may also be related to changes in thrombotic factors such as reduced fibrinogen levels[25] and reduced platelet aggregation.[26] A favorable association between moderate consumption and the amino acid, homocysteine may also be relevant (Table 2).[27,28] Beverage type may play a role with several nonethanol components of wine and beer being linked to additional benefit.[29] However, current data concerning beverage type are inconclusive.[30]

Alcohol and hypertension

There is strong evidence associating excessive alcohol consumption with hypertension. However, at light to moderate intake levels no significant association exists. In a study of 14 077 British women the prevalence of hypertension was not statistically different between nondrinkers and those drinking less than 15 units of alcohol per week.[31] As part of the Prevention and Treatment of Hypertension Study, the effect of reduced alcohol intake on blood pressure was examined in 641 moderate consuming veterans.[32] After six months the authors concluded that reducing alcohol intake in moderate consumers was not clinically effective in preventing or treating hypertension.

Alcohol and patient care

Heavy and high risk alcohol consumption is associated with considerable risk of mortality and death. It can contribute to conditions such as liver cirrhosis, pancreatitis, cardiomyopathy and hypertension, and is directly responsible for much social and physical trauma in our community. The general practitioner should always work to reduce alcohol related patient harm. In general excessive alcohol consumption (>4 drinks per day in men, >2 drinks per day in women) should be discouraged in all patients.

On the other hand, light to moderate alcohol intake is associated with cardiovascular benefit that appears amplified in those individuals at risk. The challenge for the GP, therefore, is to balance these benefits against the risks and to tailor advice specific to the individual. The following discussion applies only to the middle aged and elderly population.

Light to moderate drinkers

General practitioners should offer advice to light to moderate drinkers that allows for benefits but that also guards against potential harms. Patients should be reassured and informed of the benefits of their current consumption and where appropriate encouraged to continue. 'One drink with the evening meal' is probably a suitable suggestion for both men and women. If coupled with strategies to help keep drinking safe (eg. avoid binge drinking, keep one or two days alcohol free a week, avoid operating machinery,[1] etc.) this information can form an important aspect of preventive medicine in general practice.

As a minimum, we should not discourage light to moderate consumption in high cardiovascular and type 2 diabetes risk patients (Table 3). These patients stand to benefit most from light to moderate alcohol consumption.

Traditionally hypertensive and obese patients are advised to reduce alcohol intake to assist in lowering blood pressure and weight respectively. Although this is good advice for excessive consumers, light to moderate consumers appear unlikely to experience benefit, and any change could potentially increase other cardiovascular risk factors.[23,32] Practitioners should be careful not to discourage such patients from continuing safe alcohol consumption.

Who should abstain from alcohol?

There are specific circumstances where light to moderate alcohol intake is not advisable. These include pregnant women, people with medical conditions exacerbated by alcohol, those with a past or current history of problem drinking and people taking medications where alcohol is contraindicated. In addition, recent meta-analysis suggests a 10% greater risk of breast cancer among consumers of one alcoholic drink per day.[33] Women with a past history or strong family history of breast cancer should therefore be advised to minimise alcohol intake, especially if their cardiovascular risk is low (Table 3).

Problem drinkers

Advice offered to alcoholic and problem drinkers should focus on reducing harm. This should involve encouraging and assisting those affected to achieve complete abstinence. Advising problem drinkers to reduce intake to moderate levels (eg. one drink per day) for health benefit is likely to be an ineffective and arguably negligent suggestion.

Nondrinkers

While abstinence is technically a risk factor for cardiovascular disease and type 2 diabetes, there is currently little justification for advising nondrinkers to commence light alcohol consumption for health reasons. Nondrinkers abstain for valid personal, social and cultural reasons and this should be respected.

Conclusion

Alcohol has a wide variety of effects that vary greatly with intake level and between individuals. Advice to patients should be individually tailored and focussed on minimising harm and promoting benefit. The routine discouragement of all alcohol consumption can no longer be justified.

Resource

The NHMRC Australian alcohol guidelines: Health risks and benefits: http://www./nhmrc.gov.au/publications/dshome.htm.

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SUMMARY OF IMPORTANT POINTS

- Light to moderate alcohol consumption is associated with cardiovascular benefit.
- The benefit of light to moderate alcohol consumption is thought mainly to be due to increased insulin sensitivity and HDL-cholesterol.
- Women with a combination of high breast cancer risk and low cardiovascular risk should minimise alcohol consumption.
- It is important that light to moderate alcohol consumption is not discouraged in high cardiovascular and type 2 diabetes risk patients.
- Reducing alcohol intake in moderate consumers is unlikely to assist treatment of hypertension and obesity and may potentially increase other cardiovascular risks.

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