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## Update on Wine and Health

### Key Points

1. Wine consumption in moderation has been shown to reduce coronary heart disease events.
2. Recent studies reveal mechanisms for cardiac benefits, especially in effects on inflammation.
3. Wine consumption can be part of a healthy lifestyle.

### Introduction

Wine has been enjoyed by human beings as a libation for thousands of years. For much of that time, it has also been used for various medicinal purposes. It has played an integral role in culture and religion. Since the reporting of the French paradox in 1991, wine appreciation in the United States has been increasing. In the Summer 1999 issue of *Carle Selected Papers*, I had written an article on the health benefits of wine.<sup>1</sup> My task in this article is to provide an update on the research findings on wine. Since alcohol abuse continues to be a societal problem, I will stress that moderation is essential. In addition, recent studies demonstrate that the health benefits seen at moderate levels can be lost at higher levels of alcohol consumption.

### Text

Several studies have established the benefit of moderate wine consumption in the reduction of coronary heart disease (CHD) events. Recent investigations extend those findings into such areas as congestive heart failure (CHF), especially for older adults. Among older persons in one study, increasing levels of moderate alcohol consumption are associated with a decreasing risk of CHF; this was not entirely mediated by a reduction in the risk of myocardial infarction.<sup>2</sup> A prior report from the Framingham Heart Study had also shown that moderate alcohol consumption protects against CHF.<sup>3</sup>

Some of the benefits appear to be from the raising of HDL cholesterol levels and lowering of the blood concentration of lipoprotein (a). The anti-inflammatory effects of the flavonoids in (especially red) wine may be involved. In the search for mechanisms of benefit, effects on inflammation are becoming more prominent. Moderate alcohol consumption raises plasma adiponectin levels, which may curb inflammation and reduce CHD. Interestingly, moderate alcohol in combination with higher dietary fat produced increased adiponectin levels, while a carbohydrate-rich diet with a high glycemic load produced lower adiponectin levels. In fact, obesity and diabetes mellitus are associated with low levels of adiponectin. Dose dependency has also been shown, with increasing adiponectin levels from 5.0 to 29.9 g of alcohol daily (roughly 0.5 to 3 drinks per day), as opposed to decreasing levels at over 30 g of daily alcohol.<sup>4</sup>

Another interesting finding is the compound resveratrol. This is found in red wines, particularly those made in cooler climates like that of Burgundy, France, and New York State. Resveratrol may prolong life by activating an ancient survival reflex; this mimics the effect of a low-calorie diet. Dr. David Sinclair of Harvard Medical School has demonstrated that it prolongs life in yeast by 70%. Animal and human studies are planned.

A study measuring markers of inflammation found lower levels of Interleukin-6 (IL-6) and C-reactive protein (CRP) in individuals consuming one to seven drinks per week, compared to those who were not drinking. These benefits were lost when the consumption was more than seven drinks per week. This provides a possible explanation of benefits in reduction of heart attacks and strokes. Tumor necrosis factor (TNF) and plasminogen activator inhibitor-1 (PAI-1) levels were also examined, but no associated changes were seen in these parameters. The study was conducted on 2574 healthy seniors, aged 70 to 79.

Adjusted for age, race, gender, education, smoking, diabetes, physical activity, the IL-6 and CRP benefits persisted. One drink was defined as a can of beer, glass of wine, or shot of liquor.<sup>5</sup>

Some of the cardiovascular benefits may derive from nitric oxide, which promotes endothelium-dependent vasodilation. An increase in the expression of human endothelial nitric oxide synthase has been shown in a study using red wine.<sup>6</sup> Red wine has an abundance of phenolic acids, polyphenols, and flavonoids.

Diabetes is considered a coronary heart disease risk equivalent, based on the high risk of cardiovascular events in this population. Investigation shows that alcohol and polyphenols from wine have favorable effects on glucose metabolism and insulin sensitivity. A recent review of the literature summarized that one to three drinks per day reduces risk of developing diabetes by 33 to 56%.<sup>7</sup> Among diabetics, the risk of developing CHD was reduced 34 to 55%. In addition, the alcohol consumption did not interfere with standard medications for diabetes mellitus.

Benefits other than cardiac are also being reported. Consumption of one to six drinks weekly is associated with a lower risk of incident dementia among older adults.<sup>3</sup> Small studies have shown benefits in peripheral arterial disease, age-related macular degeneration, kidney stones, food poisoning and psychological distress.

The definition of “one drink” is sometimes debated. By convention, one drink is 1.5 oz of 80-proof spirits (bourbon, Scotch, vodka, gin), 1 oz of 100-proof spirits, 4 oz of wine, or 12 oz of beer. For wine, “moderate” consumption, as defined in various studies, is typically one to three glasses per day.

## Conclusion

The recent research clearly shows that moderate alcohol consumption is beneficial, and that the benefit is lost at higher levels of consumption. The literature is starting to show plausible mechanisms for health benefit. Although one does not need support from the medical literature to appreciate and enjoy wine, it is nice to know that it appears to be part of a healthy lifestyle. As a cardiologist, I encourage the reader to incorporate a balanced diet and regular exercise as well. The enjoyment of wine, as well as the artful pairing of food with wine, is an increasing trend in Central Illinois. I was recently asked by the University of Illinois Alumni Association to speak to a gathering of alumni on wine and health. Furthermore, the quality of wine available locally has improved over the years I have lived here. Cheers!

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## References

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### **CME Questions 1a-c**

Please select the best answer for the following:

- 1a. Recent studies support the benefits of wine in all but which condition:
  - a. Coronary heart disease
  - b. Congestive heart failure
  - c. Cirrhosis
  - d. Dementia
  
- 1b. Inflammatory markers that have been studied in relation to wine intake include:
  - a. CRP
  - b. IL-6
  - c. Matrix metalloproteinases
  - d. ICAM
  - e. A and b
  
- 1c. In diabetics, wine may reduce risks without interfering with standard diabetes medications.
  - a. True
  - b. False