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Wine and Health

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Key Points

- While its medicinal uses can be traced throughout the history of civilization, the scientific appreciation of the health benefits of wine – particularly with regard to heart disease prevention – is recent.
- A prospective cohort study involving 22,071 apparently healthy male physicians, 40-80 years-of-age participating in the Physician's Health Study, found a strong inverse correlation between alcohol intake and risk of angina pectoris and myocardial infarction.
- In a recent study, red wine was found to inhibit oxidation of plasma LDL from healthy male subjects, whereas neither white wine or beer did.
- Thus, moderation is a notion we must take to heart to enjoy wine and take advantage of its health benefits.

I was pleased to be asked to write on this topic for *Carle Selected Papers*. Dare I say writing about wine is more fun than writing about electrophysiology?

Basically, wine is fermented grape juice. However, such complexity and enjoyment are offered by the types of grapes used and the talent of the different wine makers. Consequently, much can be said about wine. Its prominence throughout history and religion attests to its importance.

The making of wine is estimated to have begun 7000 years ago. Caves containing tartaric acid (which naturally occurs in fermented grape juices) are attributable to the Egyptians of 4000 BC, the Babylonians of 2250 BC and the Chinese of 2000 BC. In fact, wine was so revered that several ancient

cultures actually had a god of wine: Osiris for the Egyptians, Dionysus for the Greeks, Bacchus for the Romans and Fufluns for the Etruscans. Wine remains an essential part of several religious traditions – eg, representing the blood of Christ in Christianity – and monks were responsible for many refinements in wine making.

Wine has also played an important role in the realm of medicine. It was used to clean wounds until the 19th century and was commonly advocated to treat fear, anxiety and pain. While its medicinal uses can be traced throughout the history of civilization, the scientific appreciation of the health benefits of wine – particularly with regard to heart disease prevention – is recent.

The French paradox was reported in 1991.¹ Even though the French enjoy a diet which is typically high in fat they, as a population, have low rates of death from coronary heart disease (CHD). After some initial jokes about the French just being unable to diagnose CHD, serious studies have shown that 1-3 glasses of wine per day could reduce one's CHD risk by 25-45%. A key argument is the raising of high density lipoprotein (HDL) by wine and other alcohol. There are studies underway to try to link at least some of this benefit to the flavonoids in red wine; antioxidant activity has already been demonstrated.² Some theories on this benefit center on the notion that it is not just the wine but the lifestyle that accompanies the enjoyment of wine – eg, having wine with food may be more beneficial than drinking wine on an empty stomach – physical activity and vegetable intake are other potentially important variables.

Looking at recent data, in a systematic review of 12 ecological, 3 case control and 10 prospective cohort studies, there is evidence that all alcoholic drinks were associated with a lower risk of morbidity and mortality

from CHD.³ Most ecological studies suggested that wine was more effective, whereas the case control studies did not favor any specific type of drink, and the 12 prospective cohort studies found equal benefit: 4 with moderate wine drinking, 4 with beer and 4 with spirits. A Copenhagen study of 2,826 men, age 53-74 years without overt CHD followed over 6 years, found the inverse risk between alcohol intake and CHD was dependent on the concentration of low density lipoprotein (LDL). Those with high LDLs had benefit from drinking 1-22 beverages per week, while those with LDL < 3.63 mmol/l had no measurable benefit from alcohol consumption.⁴ The relative risk ranged from 0.4 ($p < 0.05$) for those drinking 1-21 beverages per week to 0.2 ($p < 0.01$) for those drinking ≥ 22 , using abstainers as a reference.

A prospective cohort study involving 22,071 apparently healthy male physicians, 40-80 years-of-age participating in the Physicians' Health Study, found a strong inverse correlation between alcohol intake and risk of angina pectoris and myocardial infarction.⁵ Compared with men who consumed < 1 drink per week, those who consumed 1 drink per day had relative risks of 0.69 for angina and 0.65 for myocardial infarction. These independent associations were seen with either nondrinkers or occasional drinkers used as the reference group. An increased risk for death from cancer was found among participants consuming 2 or more drinks per day. They postulated primarily an antiatherogenic increase in HDL as the mechanism of benefit, since it was similar for both angina and myocardial infarction. A prior study by this group did suggest an antithrombotic affect to moderate alcohol consumption.⁶

In a prospective study of CHD hospitalizations among 128,934 adult members of a Northern California prepaid comprehensive health care program, additional analyses were performed on the roles of beverage types – wine, beer, hard liquor.⁷ Between 1978 and December 31, 1991, there were 3,931 hospitalizations: 1,757 with acute myocardial infarction, 848 with other acute coronary artery syndrome, 753 with angina pectoris and 573 with chronic ischemic heart disease. Uncontrolled for total alcohol, each beverage type showed evidence for CHD protection, weakest for liquor and strongest for beer in men and wine in women. Controlled for total alcohol, statistical significance was lost except for beer in men and red and white wine in both men and women. Red wine did

not appear to offer additional protection over white wine. A Japanese study examined the inhibition by red wine, white wine, beer, and red grape juice of low density lipoprotein (LDL) oxidation.⁸ Red wine was found to inhibit oxidation of plasma LDL from healthy male subjects, whereas neither white wine nor beer did. This correlated with the large amount of flavonoids in red wine, compared to the relative lack in white wine and beer. Grape juice, which is also abundant in flavonoids, suppressed LDL oxidation in vitro but not after ingestion, while ingestion of red wine did produce in vivo antioxidant activity. The authors attributed this to more efficient intestinal absorption of flavonoids in red wine (vs grape juice), but I am encouraged by the result. In a study of the impact of folate and vitamin B6 intake on CHD among women, a subgroup analysis found that the inverse association between a high folate diet and CHD was strongest among women who consumed up to one alcoholic beverage per day.⁹

The relative distribution of wine consumption per capita is as you would expect. Leading the list are the French who consume 17.5 gallons/citizen/year. The Italians, number 2, are not far behind. In the U.S., number 30, the rate is less than 2 gallons/citizen/year. Thomas Jefferson, America's first distinguished viticulturist, felt that wine was indispensable to health and I agree. Apparently I am not alone in my thinking, for since the reporting of the French paradox wine consumption has been on the rise in this country.

Although the dangers of the chronic consumption of large amounts of alcohol and of acute alcohol intoxication are well-established,¹⁰ the foregoing suggestion is that moderate regular consumption, particularly of wine, can be beneficial. As stated eloquently in an editorial, there are no biologic curbs on excess drinking.¹¹ Thus, moderation is a notion we must take to heart to enjoy wine and take advantage of its health benefits.

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