
Benefits of Red Wine -A Review

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Abstract: The healthful and nutritive properties of wine have been acknowledged for thousands of years. Moderate consumption of red wine on a regular basis may be preventative against coronary disease. Moderate wine consumption with reduced mortality, mostly due to reduced incidence cardiovascular disease. Diet rich in fruit and vegetables, together with moderate amounts of alcohol, but more specific red wine in moderation, is protective against various degenerative diseases. Variety of mechanisms that target all the crucial steps of atherosclerosis, from early formation of the atherosclerotic plaque to its life-threatening complications (ulceration, thrombosis, vessel occlusion and infarction). These effects are attributable to the synergic properties of several biochemical components of wine (alcohol, resveratrol, and especially polyphenol compounds), particularly the red varieties. Laboratory evidence to promote the consumption of grapes and wine as part of a balanced diet and lifestyle certain individuals to prevent cardiovascular disease. The presence of salicylic acid and other phenolic compounds that provide protection against platelet aggregation y altering eicosanoid metabolism in favour of increased prostacyclin and decreased thromboxane A.

Keywords: Benefits, Red, Wine.

INTRODUCTION

The harmful effects of risk factors for cardiovascular disease as often linear, as in the case of cigarette smoking and blood lipid abnormalities . For alcohol, however, the situation is different, with data for moderate-dose cardiovascular benefits and high-dose harm . Putative molecular mechanisms involve newly described signals and paths that may help to explain the proposed protective qualities of moderate amounts of red wine (Opie and Lecour, 2007). Epidemiological evidence confirms that light to moderate alcohol consumption reduces the risk of morbidity and mortality from cardiovascular disease . Regular consumption of any type of alcoholic beverage appears to be healthy benefits, but red wine with its abundant antioxidant contents, seems to offer additional healthy benefits (Huang *et al.*, 2010). A balanced view of alcohol drinking and health should consider harmful and beneficial effects, amount of alcohol, beverage choice, and drinking patterns . Mortality has been studied as one specific global measure . Heavy drinking, defined as usual daily intake of three or more standard-sized drinks, carries excess mortality from cardiovascular and no cardiovascular causes, presumably due to both physiologic effects of alcohol and behavioral traits of heavy drinkers . It is unclear whether choice of wine, liquor, or beer plays a role in the adverse effects of heavy alcohol drinking (Klatsky *et al.*, 2003).

Lighter drinking carries lower total mortality risk, largely because of lower coronary disease risk. Behavioral traits of light drinkers compared with those of abstainers probably also play some role in the lower risk for light drinkers. However, demonstration of plausible protective mechanisms of alcohol against coronary disease, including an effect via high density lipoprotein cholesterol and antithrombotic actions, has resulted in widespread acceptance of a protective hypothesis. Interest in possible additional benefits of wine developed when international comparisons showed that persons in wine-drinking countries had a lower coronary disease mortality risk than persons in countries where the preponderant beverages were beer or liquor (Gronbaek *et al.*, 1995; Klatsky *et al.*, 2003).

Limited data exist about beverage choice and total mortality. Danish studies show that wine drinkers, compared with beer or liquor drinkers, have lower risks of total mortality , cancer, and stroke, and a French report indicates lower total and cardiovascular disease mortality. Attention to behavioral and other user trait differences has generally found more favorable health traits among wine drinkers. In a recent study we found that the U shape persisted when the effects of other risk factors, such as smoking and obesity, were controlled for(Gronbaek *et al.*, 1995; Maggiolini, 2005).

Previously our university had conducted numerous clinical trials(Venugopalan *et al.*, 2014; Ganapathy *et al.*, 2016; Jyothi *et al.*, 2017) and in-vitro studies(Duraisamy *et al.*, 2019) and case reports(Ashok *et al.*, 2014; Ranganathan, Ganapathy and Jain, 2017) and systemic review(Selvan and Ganapathy, 2016; Subasree,

Murthykumar and Others, 2016; Vijayalakshmi and Ganapathy, 2016; Ganapathy, Kannan and Venugopalan, 2017; Jain *et al.*, 2018; Kannan and Venugopalan, 2018) and surveys(Ashok and Suvitha, 2016; Basha, Ganapathy and Venugopalan, 2018) over the past 5 years. Now we are focusing on literature review. Therefore the current article was to review the benefits of red wines. Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhilarasan, 2018; Ezhilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J *et al.*, 2018; Menon *et al.*, 2018; Prabakar *et al.*, 2018; Rajeshkumar *et al.*, 2018, 2019; Vishnu Prasad *et al.*, 2018; Wahab *et al.*, 2018; Dua *et al.*, 2019; Duraisamy *et al.*, 2019; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhilarasan, 2019; Malli Sureshbabu *et al.*, 2019; Mehta *et al.*, 2019; Panchal, Jeevanandan and Subramanian, 2019; Rajendran *et al.*, 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma *et al.*, 2019; Varghese, Ramesh and Veeraiyan, 2019; Gomathi *et al.*, 2020; Samuel, Acharya and Rao, 2020)

How Red Wine Is Made

The first part where the grapes are grown and harvested . A grape vine begins to produce grapes after the third year. The vine's age and grapes only grow on stalks that are one year old. Because of this problem, viticulturists prune their vineyards back every year to encourage new growth of grapes. Wine grapes grow unpredictably in the most unlikely places of the world.

The second part is the crushing of grapes. Wine grapes most commonly destemmed to reduce harsh vegetal-tasting tannin. Sometimes wineries have long sorting tables and conveyor belts to further check for leaves or bad grapes. Then the grapes are crushed and put into an environment where it is conducive for yeast to thrive. Red wine gets deep when it is fermented with the skins(Higman, 2011).

The third part is fermenting sugar into alcohol. The fermentation starts when a yeast culture grows and consumes the available sugar and turns it into alcohol. There are many different kinds of yeast strains that either happen naturally or are added (called *inoculation*) to control the flavor. Red wine is fermented at warmer temperatures than white wines. Also, red wines are usually fermented until all the sugar is consumed which will create a dry wine.

The fourth is the bottling process. Red wines age for anywhere from 4 months to 4 years before being bottled. During aging, 'fining' often occurs to make the wine clear. Wine additives are often used that glom onto dissolved proteins. After fining, filtration happens and the wine gets bottled(11). Some red wines are not fined or filtered to add more body. Unfiltered wines should be decanted before drinking.(‘Phytochemical Screening and Antimicrobial Activity of Ethanolic Extract of Handal Fruit CitrullusColocynthisin North Kordofan’, 2015)

Ingredients of Red Wine

Red wine is rich with antioxidants. Most of it is quercetin and resveratrol. These antioxidants boost the body processes but particularly revered for improving heart health. Bioflavonoids or also called as flavonoids or vitamin P naturally occur in all fruits, vegetables and herbs. Even chocolate, tea, seeds and dry beans contain vitamin P . It's a large family of polyphenolic compounds that carry out function in plants, fighting environmental stresses and modulating cell growth. The best known flavonoids that's present in red wine is quercetin.(Huang *et al.*, 2010)

Quercetin is a naturally occurring phenol in grape skin and stems that is developed to protect the grapes from ultraviolet light damage. This concludes that more grapes are exposed to sunlight, the more quercetin they contain. Quercetin reacts with anthocyanins to make deeper and vibrant colours. This anthocyanins contribute little to taste of wine. Because anthocyanins are ready to polymerize with tannins. Tannin is important role in retention in and aging. This whole process makes the color of the wine more stable through aging. Quercetin is an important and most abundant antioxidants in human diet. It plays an important role in fighting free radical damage(5). Research shows that quercetin can manage certain health condition such as heart disease, infections, chronic fatigue, autoimmune disorders, arthritis, allergies, blood vessel problems, cognitive impairment, eye-related disorders, high cholesterol, skin disorders, cancer, stomach ulcer, atherosclerosis, diabetes and gout.(Gronbaek *et al.*, 1995)

Resveratrol is another polyphenolic bioflavonoid antioxidant found in red wine. It is classified as a phytoestrogen because it interacts with estrogen receptors. It is believed to be one of the most potent polyphenols and strongest protectors against free radical damage, cognitive decline, obesity and cardiovascular disease. Plants actually produce resveratrol partly as a protective mechanism and response to stressors within their environments, such as radiation, injury and fungal infections.Red wine is probably known as best source of resveratrol due to the fermentation process that turns grape juice to alcohol. When red wine is produced, grape seeds and skins ferment in the grape's juices, which has a positive effect on the levels and availability of resveratrol. People use resveratrol for a number of anti-aging and healing benefits and research suggest that it can boost your health such as fight oxidative stress, support cellular and tissue health, protect against cancer, promote circulation, protect cognitive health, prevent premature aging, support healthy digestion, improve energy and endurance, protect against diabetes(Maggiolini, 2005).

Red Wine Benefit for Heart

The compounds found in red wine such as polyphenols, resveratrol and quercetin have proved to have cardioprotective properties. Numerous cross-sectional, observational and controlled studies show that drinking moderate amounts of red wine has beneficial effects on many different aspects related to cardiovascular disease. The part which benefit might be that antioxidants may increase levels of high-density lipoprotein (HDL) cholesterol which is the good cholesterol and protect against cholesterol buildup. (Klatsky *et al.*, 2003)

Research shows that the antioxidant in red wine can slow down the progression of atherosclerosis. **Arteriosclerosis** is when there's buildup of fats, cholesterol and plaque in the artery walls. One of the studies that was published in the *International Journal of Molecular Medicine*, found that moderate alcohol intake, especially red wine, decreased cardiac mortality due to atherosclerosis, but people who didn't drink any red wine and people who drank too much red wine were at a higher risk of cardiac mortality.

Resveratrol might be a key ingredient in red wine that helps prevent damage to blood vessels, reduces low-density lipoprotein (LDL) cholesterol which is the bad cholesterol and prevents blood clots. Resveratrol has also shown to relax the coronary arteries, making it at least partly responsible for the red wine benefits which are associated with cardiovascular disease. (Klatsky *et al.*, 2003)

Quercetin, one of the most important flavonoids present in red wine. It is proved to promote heart health by regulating blood pressure levels, reducing inflammation and preventing oxidative stress. (Klatsky *et al.*, 2003)

Improves Cholesterol

According to a study published in the *European Journal of Clinical Nutrition*, wine consumption was associated with a significant increase in HDL cholesterol, with participants seeing their levels improve by 11 percent to 16 percent. Drinking one or two glasses of red wine a day increases HDL cholesterol level. Increasing HDL helps lower the risk of heart disease because the HDL binds with cholesterol in the body's tissues to escort it out of the body and removes fatty deposits in the walls of large blood vessels. A study shown that 45 postmenopausal women with high cholesterol found that 13.5 ounces (400 mL) per day of red wine for six weeks reduced fasting LDL cholesterol concentrations by 8 percent and increased HDL cholesterol concentrations by 17 percent. Regularly drinking a moderate amount of red wine is an excellent way to improve your cardiovascular health by lowering your LDL cholesterol, raising your HDL, decreasing oxidized LDL and decreasing chronic inflammation. To get the most advantages of red wine for cholesterol, men should drink about 2 servings and women should drink about one serving most days of the week, with meals. (Opie and Lecour, 2007)

Reduce Obesity and Reduce Weight.

A study conducted at Purdue University found shows that red wine helps to fight obesity. This is due to a compound found in grapes and other fruits such as blueberries and passionfruit which is called piceatannol which has a similar chemical structure to resveratrol. According to researchers, piceatannol blocks the immature fat cells which develop and grow. It's also found that alters the timing of gene expressions, gene functions and insulin functions during the fat cell's metabolic process. Piceatannol is effective at fighting obesity and weight because they could destroy fat cells early in the process where preventing the fat cells accumulation which causes increased body weight. (Opie and Lecour, 2007)

Red Wine Vs White Wine

Research shows that wine is more beneficial compared to beer and liquor. Study was done on 13000 men and women between the age of 30-70 years of age that had an inverse correlation with overall mortality in people consuming wine and not in beer and liquor. This low mode of wine decreased the risk of death and increased risk and drinking beer had no effect on mortality. Studies also show wine consumption is beneficial and does not matter if it's red or white wine. White wine is made by the antioxidant compounds which are primarily found in skin of red grapes which later removed after the grapes are crushed when making white wine.

Ethanol makes around 8 percent to 15 percent of red wine which has wide range of biological function and it also alter cholesterol composition. White wine has low concentration of phenolic compounds which aren't able to combat the pro-oxidant effect of ethanol. Red wine grapes are fermented with the skin, this what gives the wine its color and also provides beneficial plant compound. On the other hand, white wine have their skin removed before being fermented. This concludes that red wine is more beneficial compared to white wine. (Klatsky *et al.*, 2003)

Downside of Drinking Wine

The average glass of red wine contains 100 calories others than resveratrol and flavonoids. If you are trying to lose weight even a glass with dinner might be too much. It contains alcohol which can stress you out. It will decrease your body cortisol and increase your tendency to focus negative thoughts and will quickly stress yourself more. This leads of the cycle of drinking more and more to feel better. Wine can lower the risk of heart

disease but the alcohol increase the risk of cancer. Despite healthy properties in red wine, it contains neurotoxin which can poison your brain and tax your liver. People with history of migraines, depression should avoid drinking red wine or any kind of alcohol beverage as it can make the condition worse. Red wine is one of the most healthy alcohol but the truth is it only much better than other form of alcohol and should not drink solely to improve your health. (Opie and Lecour, 2007)

Another downside of drinking any wine, there are some ingredients such as aroma enhancers, stabilizers and clarifying agents which cannot be found in nature. These ingredients are used to extend shelf life. (Opie and Lecour, 2007)

Do the Benefits Outweigh the Risks?

It's clear that there are pros and cons to drinking red wine regularly, but the key is to keep your consumption levels to a minimum. That means having a glass of red wine now and then.

Studies consistently show that light drinkers have lower coronary artery disease risk than lifelong abstainers, leaving many researchers to conclude that red wine consumption exerts a positive effect against coronary artery disease and many other health conditions. (Dauerman, 2013)

Alcohol Free Wine

To make non-alcoholic wine, you have to start with real, alcoholic wine and use two methods to remove the alcohol, vacuum distillation and reverse osmosis. Vacuum distillation involves evaporating the alcohol, and reverse osmosis filters out the aroma compounds and phenolics that are present in alcoholic wine. Because most of the aromas are removed during these processing methods, non-alcoholic wine doesn't taste the same as alcoholic wine, and the texture is a little off since the tannins are removed. (Bakker and Clarke, 2011)

Research shows that alcohol-free wine may also provide health benefits. According to a 2012 study conducted at the University of Cape Town in South Africa, "the reduction of alcohol content from 12 to 6 percent in wine did not alter its antioxidant and cardioprotective properties." Researchers conclude that moderate consumption of lower alcohol wines offer beneficial effects without the added risks associated with traditional alcoholic wines, so if you want the benefits of red wine without the alcohol it's possible to find it.

Another study, published by the American Heart Association, suggests that alcohol-free red wine can also decrease systolic and diastolic blood pressure(5). When 67 men at high cardiovascular risk were studied, researchers found that blood pressure levels decreased significantly, suggesting that moderate, daily consumption of alcohol-free red wine can be useful for the prevention of hypertension.

Consumption Guidelines

Scientists have found that the darker the wine, contains high antioxidant and research points shows that the red wine has highest antioxidant levels. Dark red wines contain higher levels of antioxidants because the grape skins and seeds soak in the liquid for a longer period of time, thereby increasing the extraction of nutrients during the fermentation process. Although red wines that are labeled as organic may still contain some additives, it has to be in small amounts so I recommend you choose organic red wines that are a deep red color.

Stick to light or moderate drinking by having no more than five glasses of wine per week, and don't drink more than two glasses in one day. I like to drink a glass of red wine once in a while in order to get a boost of the powerful antioxidants that restore the overall health of my cells and body, along with the other benefits of red wine. (Robinson and Harding, 2015)

Sometimes it's easy to lose track of how much wine you've consumed in one day or sitting(5). For instance, during holiday dinners, as the family sits around talking and feasting, you may drink a few too many glasses of wine without even realizing it. Here's a few easy tricks that I use to keep my alcohol portions small, even during parties, family dinners or special events such plan ahead if you know there's an event or dinner coming up where you will have a glass or two of wine, then keep the other days of your week alcohol-free. Drink Slowly and enjoy and savor every sip, and try not to be distracted when sipping your wine. Don't refill your glass unless it's empty. Sometimes we add a little wine to our glasses, even though it's not yet empty. Wait until you've finished the entire glass and then pour a little more if you want it. Order or pour smaller portions. Only fill your glass half way or keep smaller, sample size wine glasses at home. If you are out, ask if you can order a four-ounce pour. Drink wine with water on the side. If you don't have another drink available, you'll drink wine because you're thirsty and end up having too much. Keep lemon water or seltzer on the table as well and alternate between the wine and water. (Unwin, 1991) Our institution is passionate about high quality evidence based research and has excelled in various fields ((Pc, Marimuthu and Devadoss, 2018; Ramesh *et al.*, 2018; Vijayashree Priyadharsini, Smiline Giriya and Paramasivam, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019; Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Chandrasekar *et al.*, 2020; Mathew *et al.*, 2020; R *et al.*, 2020; Samuel, 2021)

CONCLUSION

Red wine is loaded with antioxidants, particularly flavonoids like quercetin and resveratrol. Red wine is loaded with antioxidants, particularly flavonoids like quercetin and resveratrol. These antioxidants boost many of the body's processes but are particularly revered for improving heart health. These compounds enhance the benefits of red wine. It's important to note that more wine doesn't mean greater health benefits. Despite the healthy properties in red wine, the alcohol itself is actually a neurotoxin, meaning it can poison your brain and tax your liver, among other bodily systems. This being said, it's best to drink small amounts of wine now and then. Don't exceed five glasses per week and no more than two in one day. This is the best way to get the benefits of red wine without counteracting them by too much alcohol consumption. These antioxidants boost many of the body's processes but are particularly revered for improving heart health. These compounds enhance the benefits of red wine. Other health benefits of red wine include its ability to improve cholesterol, fight free radical damage, help manage diabetes, fight obesity and prevent cognitive decline. There's research that suggests that wine consumption in general is more beneficial than consuming beer or liquor, and red wine contains higher levels of antioxidants than white wine. That's why the benefits of red wine are greater than white wine benefits. The darker the wine, the higher the antioxidant content, and research points to pinot noir as the red wine with the highest antioxidant levels. Thus, pinot noir is a great choice to drink in order to get the benefits of red wine. It's important to note that more wine doesn't mean greater health benefits. Despite the healthy properties in red wine, the alcohol itself is actually a neurotoxin, meaning it can poison your brain and tax your liver, among other bodily systems. This being said, it's best to drink small amounts of wine now and then. Don't exceed five glasses per week and no more than two in one day. This is the best way to get the benefits of red wine without counteracting them by too much alcohol consumption.

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CONFLICT OF INTEREST

The authors declare that there was no conflict of interest.

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