Wine and Ocular Health

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Master Court of Sommeliers
Certified Level
Disclosures

- Dr. Paul Karpecki is a paid consultant to Science Based Health and Regeneron
- He also owns shares of PRN
Understanding Wine

- Ocular health benefits
- General health benefits
- Risks of excessive drinking
Wine and Ocular Health

- The French Paradox
- Heavier foods, creams and meats in diet
- Longer life expectancy than in the US
- Develop cataracts later in life (?)
Wine and Ocular Health

- 1045 Subjects
- Compared through photofluorometry, the density changes in cataracts
- 22% for moderate wine consumption
- 32% for no wine consumption

H Sasaki, F Jonasson, Y Suwa et al. The Protective Effect of Wine Intake on Five Year’s incidence of Cataract – Reykjavik Eye Study. ARVO Wed May 04, 2005 Abstract/Poster# 3840/B198
Wine and Ocular Health

- 3072 adults 45 to 74 years of age with macular changes indicative of AMD
- National Health Administration Eye Health survey & fundoscopy
- The researchers observed a statistically significant negative association between AMD and alcohol consumption (p<0.01)
- No benefit to beer or hard liquor – only wine in moderate consumption

Wine and Ocular Health: Resveratrol

- Can be consumed as a supplement or in red wine in particular
- Is a phytoestrogen
- Shown to fight inflammation, prevent oxidation of certain cells and prevent apoptosis
Wine and Ocular Health: Cataracts

- An experimental cataract model on lab rats
- It has been shown that a subcutaneous injection of selenite can induce senile cataract development.
- In the study rats were either injected with normal saline, Sodium selenite alone or sodium selenite with 40mg/kg of resveratrol.
- Cataract development was graded 11 days later using photography and the lenses were analyzed for lipid peroxidation, a marker present in cataract development

Wine and Ocular Health: Cataracts

- The results showed that all the control crystalline lenses (Saline injection) were clear as expected, the lenses in group two (selenite injection) had a 100% incidence of cataract and all were graded as grade 3 to 6 (6 being the highest).
- Finally in group 3 in which the rats also received resveratrol, 7 of the 16 animals showed 0% cataract development and of the remaining 9 they were all graded at 3 or less.
- This was statistically significant (p<0.05).

Wine and Ocular Health: AMD

- Antioxidant and antiproliferative effects of resveratrol were examined in a human RPE cell line.
- The results showed that treatment with 50 and 100 micromol/L resveratrol significantly reduced proliferation of RPE cells by 10% and 25% respectively (P< 0.05).
- Resveratrol was shown to inhibit intracellular oxidation and protect the RPE cells from cell death.

Wine and Ocular Health: AMD

- The observed reduction in cell proliferation was associated with inhibition of protein kinase.
- Protein kinase was shown to be inhibited with resveratrol concentrations as low as 5 micromol/L.
- These results suggest that resveratrol can reduce oxidative stress and hyperproliferation of the RPE cells of the retina.

In one paper, researchers have found that a combination of grape seed proanthocyanidin (tannins in red wine) and resveratrol prevents inducible secular endothelial growth factor (VEGF) expression, a key element supporting angiogenesis.

Anti-VEGF therapy is the basis for all the current wet AMD therapies such as Avastin.

Wine and Ocular Health: Cornea

- Research has shown resveratrol’s ability to suppress the enzyme MMP.
- MMP has been found to be an instrumental in causing recurrent corneal erosion and persistent epithelial defects.
- This study also went on to show that resveratrol is able to actually reduce corneal neovascularization in mice eyes.

Wine and Health

- One study went one to show that the tannins (polyphenolic antioxidants) in wine are effective in reducing myocardial ischemic reperfusion injury
- Plays a crucial role in cardioprotection
- Where do tannins come from?

Wine and Health: Fountain of Youth

- A study in mice found that resveratrol possessed pro-inflammatory properties and prevented the formation of blood clots.
- Mice who consumed large quantities of the resveratrol compound, lived about 33% longer.

Wine and Health: Excess Wine

- Been linked to an increase accidents and death
- 5-year Study of 14 western European countries, age and gender adjusted. Accidents were measured on a per consumption basis. Data confirmed that accident mortality rates were affected by per capita consumption[i].

Wine and Health: Excess Wine

- Been linked to an increase in heart disease
- To emphasize the point, research has shown that when looking specifically at Ischemic Heart Disease (IHD)
- Mortality rates were directly affected by consumption levels
- Ranged from protective effects with moderate alcohol consumption to harmful heart effects with heavy drinking

Liver damage and excessive drinking
More recent research has found that the main mechanism in liver cirrhosis is the activation of hepatic stellate cells, which acquire a myofibroblast-like phenotype.[i]
Phenolic compounds contained in red wine have been shown to have antibibrotic properties (kidney cell failure) on activated hepatic stellate cells

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Wine and Health: Excess Wine

- Epidemiological data have identified chronic, excessive alcohol consumption as a risk factor to cancers including those of the respiratory tract, upper gastrointestinal, liver, breast and colorectal.

- The pathophysiological mechanisms include acetaldehyde (AA), free-radical damage and loss of nutritional factors.

  - Seitz HK, Meier P. The role of acetaldehyde in upper digestive tract cancer in alcoholics. Transl Resources. 2007 Jun;149(6):293-7
Wine and Health: Excess Wine

- Important for clinicians to assess the level of alcohol intake during a patient history.
- The differences between daily intake of small to moderate alcohol versus large quantities may be the difference between preventing and causing disease.
- 1-2 glasses per day, likely beneficial.
- 1-2 bottles per day, likely NOT so good.
Resveratrol is also present in berries, grapes, nuts and grape juice.

Ounce for ounce, red wine packs two times more flavonoids.

The fermentation process allows resveratrol to be absorbed by the body more readily.
Wine and Ocular Health

- Ocular health benefits
  - Retinal disease - AMD
  - Cataracts?
  - Corneal disease – RCE?
  - Other diseases that involve anti-VEGF?

- General health benefits - French Paradox
- Risks of excessive alcohol and optometry’s role
Thank You

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