Key messages from WineHealth 2013 – International Wine and Health Conference

By Creina Stockley
Health and Regulatory Information Manager
Australian Wine Research Institute. Email: creina.stockley@awri.com.au

The seventh in the series of WineHealth International Wine and Health conferences was held in Sydney on 18-20 July 2013. There were eight sessions comprising 28 presentations. The data presented strengthened the evidence base for light to moderate wine consumption to be considered as a legitimate component of a healthy diet and lifestyle for the general population. This included the general elderly population aiming to age healthily. The key messages from the presentations can be summarised as follows:

LIGHT TO MODERATE WINE CONSUMPTION CAN DECREASE THE RISK OF DEATH IN GENERAL (ALL-CAUSE MORTALITY) IN BOTH MEN AND WOMEN, IRRESPECTIVE OF INCREASING AGE, COMPARED WITH ABSTAINERS

The longitudinal Dubbo Study of the Elderly[1] examined the relationship between alcohol consumption and mortality over a 20-year period. The inclusion of any alcohol in the diet increased the lifespan of both men and women by 12 months. The relationship between alcohol consumption and all-cause morality in the elderly was also J-shaped and similar to that of a younger peer population. All subjects in the low[2] and moderate[3] consumption categories had a significant 25% lower risk of all-cause mortality compared with heavier consumption, which translated to 20% and 28%, respectively, versus nil consumption. There was a broadly similar reduction in all-cause mortality whether the predominant intake was beer or wine/spirits. There appeared to be significant protection against cardiovascular disease at low alcohol consumption and this relationship did not appear to be affected or mediated by diabetes, hypertension, obesity or HDL cholesterol.

LIGHT TO MODERATE WINE CONSUMPTION CAN DECREASE THE RISK OF, AND DEATH FROM, CARDIOVASCULAR DISEASE IN BOTH MEN AND WOMEN COMPARED WITH ABSTAINERS

In a younger US population of women which was studied over a seven-year period in the Study of Women's Health Across the Nation (SWAN), a J-shaped relationship was also seen between low (<1 drink/day) and moderate (1 drink/day) wine consumption and cardiovascular disease. This observation was supported by statistically significant changes in biological markers for cardioprotective anti-blood clotting and anti-inflammatory mechanisms such as C-reactive protein, fibrinogen and plasminogen activator inhibitor, compared with that seen in abstainers. It was consistent across ethnic groups and independent of a healthy diet and lifestyle, and overall alcohol consumption.

Starting at a similar time, the Spanish PREDMED study - a parallel-group, multicentre, randomised, controlled clinical five-year study - assessed the effects of a Mediterranean diet that included the regular moderate consumption of wine on the prevention of cardiovascular disease in 7447 subjects aged 55-80 years. Moderate wine consumers showed a consistent decrease in certain biological risk factors for cardiovascular disease such as the plasma concentration of triglyceride (lipid)[4] and glucose compared with abstainers, and heart rate also decreased. There was, however, no corresponding change in either systolic or diastolic blood pressure until more than 14 drinks per week were consumed. Blood pressure was then observed to significantly increase, consistent with increasing risk of cardiovascular disease past moderate consumption. A genetic analysis of risk factors for cardiovascular disease, such as lipoprotein abnormalities, oxidative stress and inflammation, suggests that they are also implicated in the significance of any impact of alcoholic beverages on cardiovascular risk. For example, in a population predisposed to cardiac arrhythmias and heart failure (HFE gene mutation positive), moderate red wine consumption increased rather than decreased the plasma concentration of triglycerides.

THE ALCOHOL, PHENOLIC COMPOUND AND OTHER COMPONENTS OF WINE CAN HAVE DIFFERENT PROTECTIVE EFFECTS IN THE BODY'S CELLS, ORGANS AND TISSUES

Discussion about improvement in other cardioprotective mechanisms attributed to wine consumption included nitric oxide (NO) synthesis. Where impaired, synthesis of nitric oxide in the endothelium or lining of blood vessel walls contributes to the onset of atherosclerosis, which is another risk factor for cardiovascular disease. Particular phenolic compounds, such as resveratrol, have been observed in test tube and limited animal and human studies to increase nitric oxide synthesis. A four-week study comparing the effects of a moderate (three drinks/day) consumption of red wine, dealcoholised red wine and gin (a phenolic compound-free alcoholic beverage) in 67 subjects showed that dealcoholised red wine most significantly increased NO synthesis and decreased systolic and diastolic blood pressure compared with red wine and gin. Both red wine and dealcoholised red wine (that is, phenolic compounds), however, decreased plasma insulin and insulin resistance, while all three beverages (that is, alcohol and phenolic compounds) increased the plasma concentration of HDL-cholesterol, apolipoprotein A-I and A-II which are all associated with cardioprotection. In addition, alcohol and phenolic compounds in red wine modulated leukocyte adhersion molecules and systemic inflammatory mediators associated with the initiation and progression of cardiovascular disease. This implies that the combined effects of the alcohol and phenolic components of red wine potentially confer greater cardioprotection compared with other alcoholic beverages.

Another potential cardioprotective component of wine other than alcohol or the phenolic compounds is melatonin, which is also present in measurable amounts in red wine. One of the pathways associated with cardiovascular disease and specifically the cardiac tissue damage caused when blood supply returns to the tissue after a period of ischemia or lack of oxygen (reperfusion injury), is the novel intrinsic pro-survival survivor activator factor enhancement (SAFE) pathway. This pathway involves the activation of the cytokine tumour necrosis factor alpha (TNFα), its receptor 2 (TNFR2) and the transcription factor signal transducer and activator of transcription 3 (STAT3). In a rat animal model, melatonin in red wine (equivalent to 75ng melatonin in two drinks/day for seven days) was shown to protect the rat heart against ischemia-reperfusion injury via the SAFE pathway. Previous studies had shown that melatonin in red wine protected the rat heart against a heart attack[5].

It is important to note that the cardioprotective effects of wine-derived phenolic compounds and specifically flavonoids on endothelial function, are similar to the effects of tea, cocoa, soy and fruit-derived flavonoids on endothelial function. Additional studies are, however, still needed in order to establish the significance of the effects of regular consumption of a diet higher in red wine flavonoids on endothelial function compared with the other dietary sources of flavonoids.

The wine-derived phenolic compounds and, specifically, the stilbene resveratrol may also have a role in longevity. That is, slowing the ageing process of the body's cells and tissues as does a calorie-restricted diet. Potential mechanisms are associated with anti-inflammatory effects associated with many different disease states.

The availability of the wine-derived phenolic compounds to the blood stream and body's tissues and cells (bioavailability) to elicit effects is often questioned, given the low concentration often observed. It was suggested at the conference that breakdown products or metabolites of the parent phenolic compounds may be broken down by lactic acid bacteria, for example, which are then more easily absorbed and available to tissues and cells, with equivalent or greater biological activity than the parent phenolic compound. Alternatively, it was shown that the wine-derived phenolic compounds may pass into the large intestine or colon to be broken down and reabsorbed and/or act directly on the colon cells, perhaps protecting against the initiation and progression of colon cancer. Studies are ongoing to identify all the potentially 'healthy' compounds in grapes and wine and their bioactivity, as well as that of their subsequent metabolites once absorbed in the body. Metabolomics screening is one tool that has been effectively used.

THE INCLUSION OF LIGHT TO MODERATE WINE CONSUMPTION IN THE DAILY DIET CAN DECREASE THE RISK AND ONSET OF COGNITIVE DECLINE AND DEMENTIA

Of particular interest in the longitudinal Dubbo Study of the Elderly was a significantly lower risk of onset of dementia at low and moderate alcohol consumption. Cognitive function is defined as the intellectual or mental processes by which knowledge is acquired, including perception, reasoning, acts of creativity, problem-solving and possible intuition. Dementia is a form of cognitive dysfunction whereby an individual loses the ability to think, remember and reason due to physical changes in the brain. Complementary to these observations in an elderly population, 100mL of red wine (one drink) containing an additional 100mg of resveratrol was also observed to improve cognitive functioning in 16 elderly individuals. The improvement was in demanding cognitive processing, while red wine alone was superior in terms of performing an attentional task, suggesting that the alcohol and resveratrol components of red wine may have different effects on brain function. A rat animal model administered Champagne wine also showed improvements in spatial working memory, which is similarly impaired in individuals with dementia, via modulation of brain signalling.

THE INCLUSION OF LIGHT TO MODERATE WINE CONSUMPTION IN THE DAILY DIET MAY ACTUALLY DECREASE, RATHER THAN INCREASE, THE RISK OF DEATH FROM CERTAIN CANCERS

A controversial and complex issue is the role of alcoholic beverages including wine in the risk of cancer. The French National Research Agency CANCERCOOL program followed 35,292 healthy

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men for 25 years. The data suggested that the 75% of men who were regular moderate alcohol consumers drinking more than 50% as wine had a lower overall risk of death from cancer, and specifically lung, lip, oral cavity, pharynx and larynx cancers (RR = 0.54, p=0.05), similar to that observed for fruit and vegetable consumption. The risk of death from cancers of the colon, stomach, pancreas, liver and prostate was not found to be related to wine preference relative to other alcoholic beverages. These reduced cancer risks for predominantly wine consumers are in contrast to that observed for men who predominantly consumed alcoholic beverages other than wine, where increased cancer risks were observed. Increasingly higher levels of any alcohol consumption, however, were correlated with increases in deaths from cancer. Overall, these results are similar to that previously seen in some other studies and suggest that light to moderate wine consumption may be associated with cancer protective effects for digestive and lung cancers.

CONCLUSION

A common message in the concluding comments of many of the papers presented was that light to moderate wine consumption should not replace a healthy diet and lifestyle, but should be an adjunct to it to promote healthy ageing, and that this information should be imparted by medical practitioners to their patients. This science is still in its infancy, however, and many more clinical and epidemiological studies are required to fully know and better understand the effects of wine and its core components on human health.

The conference proceedings of WineHealth 2013 are to be published by the peer-reviewed *Nutrition and Ageing* journal. The next International Wine and Health Conference is scheduled for 2016, hosted by Professor Jeremy Spencer, of Reading University.

REFERENCE

[1] www.dubbostudy.org

[2] Low consumption was 1-14 drinks/week for men and 1-7 drinks/week for women

[3] Moderate consumption was 15-24 drinks/week for men and 8-14 drinks/week for women

[4] After eating, the body converted any calories it doesn't need to use right away into triglycerides. The triglycerides are stored in fat cells. Later, hormones release triglycerides for energy between meals. If more calories are regularly eaten than burned, particularly 'easy' calories like carbohydrates and fats, this results in high plasma concentrations of triglycerides (hypertriglyceridemia).

[5] Lamont, K.T.; Somers, S.; Lacerda, L.; Opie, L.H.; Lecour, S. (2011) Is red wine a SAFE sip away from cardioprotection? Mechanisms involved in resveratrol-and melatonin-induced cardioprotection. J. Pineal Res. 50(4):374-380.

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