Alcohol and human health - sorting out the facts

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In light of Stephen Stern's article on page 65 of this issue of the* Wine & Viticulture Journal *in which he asserts that the wine industry is likely to be the new target of health advocates who see alcohol as "the next great evil after tobacco", we asked Creina Stockley to summarise the latest research into the effects of alcohol on health.

The latest review of the most important lifestyle and environmental factors responsible for 42.7% of all cancer in the UK in 2010 are tobacco smoking (19.4%), followed by a deficient consumption of fruits and vegetables (6.15%), occupational exposure (4.9%) and alcohol consumption (4.6%) for men, and being overweight or obese (6.9%) and contracting an infection (3.7%) for women (Parkin *et al.* 2011). The alcohol-related cancers are of the oral cavity, pharynx, larynx, oesophagus (collectively known as the aero-digestive tract), liver, colon and rectum, as well as breast in women. It has been suggested that the risk of developing a cancer of the aero-digestive tract is less when alcohol is consumed with food (Dal Maso *et al.* 2002).

Another relatively recent review of alcohol and cancer also stated that drinking, especially heavy drinking, increases cancer risk (Boffetta and Hashibe 2006), but it concluded that 'Total avoidance of alcohol, although optimum for cancer control, cannot be recommended in terms of a broad perspective of public health, in particular in countries with high incidence of cardiovascular disease'. The current National Health and Medical Research Council's (2009)[1] guidelines recommend a maximum of two standard 10g alcoholic drinks per day for both men and women to minimise risks to human health. This can be considered to be moderate consumption.

The immoderate consumption of alcoholic beverages can definitely cause adverse health effects, such as selected (but not all) cancers, as well as alcohol-induced cardiovascular disease, alcohol-induced liver disease and pancreatitis, where there may be a threshold effect. The moderate consumption of alcoholic beverages (including wine) can cause beneficial health effects, such as a reduced risk of developing and dying from selected cardiovascular diseases, diabetes and cognitive function disorders. Overall, there is a j-shaped relationship for alcohol consumption and death from all causes. Reductions in risk for cardiovascular diseases, diabetes and cognitive function disorders are underpinned by a range of clearly-defined and credible biological mechanisms for the alcohol component common to all alcoholic beverages, as well as for the phenolic component specific to wine.

Indeed, sound scientific data over more than 30 years suggests that moderate alcohol consumers are at considerably lower risk of cardiovascular diseases; and newer studies also indicate that they are at lower risk of other diseases of ageing. Cardiovascular diseases include atherosclerosis (hardening and rigidity of the coronary artery wall), high blood pressure, heart attacks, heart failure and ischaemic strokes from blockages of brain blood vessels. For example, analysis of 84 observational studies of cardiovascular disease comparing alcohol consumers with abstainers showed that the relative risks for alcohol consumers compared with abstainers were: 0.75 for overall cardiovascular disease mortality, 0.71 for coronary artery disease and 0.75 for death from coronary artery disease, 0.98 for strokes, and 1.06 for death from strokes (Ronksley *et al.* 2011). If the relative risk was 1.0, the risk would be the same for alcohol consumers and abstainers. This analysis also showed that alcohol consumption at 2.5–14.9g/day, or approximately 0.25-1.25 standard drinks, was consistently associated with a 14-25% reduction in the risk of all health outcomes assessed, compared with abstaining from alcohol. Consistent with a j-shaped relationship, the risk elevated with increased consumption, but differed for the various cardiovascular disease outcomes. The cardioprotective association with alcohol was consistently observed in diverse patient populations and in both men and women, and was apparent when controlling for known confounders, such as tobacco smoking, diet and exercise.

In addition to reducing the risk of cardiovascular disease, moderate alcohol consumption reduces the risk of dying from all or any causes (all-cause mortality). A recent study of 16,958 individuals in the US, who were followed for 18 years by the US Centers for Disease Control and Prevention (CDC), examined the relationship between four low-risk behaviours and mortality. 'Moderate consumption of alcohol' was considered as one of 'four healthy lifestyle behaviours that exert a powerful and beneficial effect on mortality' (Ford *et al.* 2011). Moderate or low-risk alcohol consumption was defined as less than or equal to two drinks per day, but more than zero for men and less than or equal to one drink/day, but more than zero for women. The other low-risk behaviours were non-smoking, eating a healthy diet, and physical activity. The CDC study authors stated that: 'The number of low-risk behaviours was inversely related to the risk for mortality. Compared with participants who had no low-risk behaviours, which included abstinence from alcohol, as well as excessive alcohol consumption, those who had all four experienced significantly reduced all-cause mortality, mortality from malignant neoplasms [cancers], major cardiovascular disease, and other causes', that is, the men and women were 63% less likely to die, 66% less likely to die from a malignant neoplasms, 65% less likely to die from major cardiovascular disease and 57%

[1] http://www.nhmrc.gov.au/your-health/alcohol-guidelines

less likely to die from other causes. Considering the potential dangers of excessive drinking, the CDC study authors also conducted sensitivity analyses omitting moderate alcohol use. The authors reported, 'The mortality risk for those who also consumed alcohol was significantly lower than for those having only the three other behaviours. Chiuve *et al.* (2006) also included light-to-moderate alcohol consumption (5-30g/day) as one of five low-risk behaviours associated with a reduced risk of coronary heart disease, irrespective of concurrent medication for hypertension or hypercholesterolemia. These behaviours were based on the Healthy Eating Index (HEI), created by the US Department of Agriculture to assess how well the US population met dietary recommendations based on the Food Guide Pyramid and the Dietary Guidelines for Americans. The HEI defined moderate alcohol consumption of 1.5-2.5 drinks/day as ideal servings for men and 0.5-1.5 drinks/day as ideal for women on the basis of the lower risk of cardiovascular disease associated with moderate alcohol consumption (McCullough *et al.* 2002).

An Australian study of 7989 individuals aged 65-83 years, who were followed for five years, showed consistent results with this CDC study (Spencer *et al.* 2005). The eight selected low-risk behaviours included having no more than two alcoholic (total 20g alcohol) drinks/day. Individuals with five or more of the selected low-risk behaviours had a lower risk of death from any cause within five years compared with those having less than five. More importantly, the study showed that while most individuals already have some healthy habits, almost all could make changes to their diet and lifestyle to improve their health. The study did not suggest abstinence from alcohol, and avoidance of heavier alcohol consumption is also inferred.

Sun *et al.* (2011) also recently showed that in addition to lower mortality, women who consumed moderate amounts of alcohol surviving to age 70 years and older generally had less disability and disease, and more signs of 'successful ageing'. For 'regular' or moderate alcohol consumers (drinking on 5-7 days/week), there was an approximately 50% greater chance of such successful ageing compared with non-drinkers.

Therefore, the moderate consumption of alcoholic beverages, but not immoderate or heavier consumption, may be a legitimate adjunct to a healthy diet and lifestyle for certain consumers.

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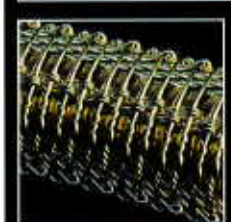

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