

Wine consumption and brain health

RESEARCH HAS RECENTLY been conducted on the effects of alcohol (and specifically wine) consumption on brain function, such as cognition and the risk of dementia. This column provides responses to some of the more common questions in this area.

WHAT IS COGNITIVE FUNCTION AND DEMENTIA?

THE COLLECTIVE SCIENTIFIC term for the mental processes of thinking, remembering, reasoning, judging and learning is 'cognitive function'.

Mild cognitive impairment is any early symptom of dementia. Dementia is a form of cognitive impairment where a person loses the ability to think, remember and reason due to physical changes in the brain. Alzheimer's disease is one specific type of dementia.

Dementia usually occurs in people aged over 65 years and it is the leading cause of disability in this age group.

In 2016 in Australia, three-in-10 people over the age of 85 and approximately one-in-10 people over 65 have dementia. Of those who have dementia, approximately 75% have Alzheimer's disease. Currently there is no cure and the number of people with dementia in Australia is expected to be approximately 900,000 by 2050 (AIHW 2012, Alzheimer's Australia 2016).

WHAT IS THE EFFECT OF ALCOHOL ON COGNITIVE FUNCTION AND DEMENTIA RISK?

Health behaviours which maintain healthy cognitive function include the consumption of fish and vegetables, moderate physical activity and moderate alcohol consumption.

Moderate alcohol consumption can be considered as 10 to 20g alcohol per day, which is equivalent to one to two standard drinks per day.

Most scientific studies show that there is a j-shaped relationship between the amount of wine consumed and cognitive decline or dementia risk, where dysfunction and risk increases above approximately 60 g alcohol per day or six standard drinks per day. Long-term heavy alcohol consumption also amplifies the risk of cognitive impairment and developing dementia associated with ageing. This is because the brains of people aged over 65 years is more sensitive to the toxic effects of the alcohol, which acts both directly and indirectly on the central nervous system of the brain.

The Dubbo Study of the Elderly which followed 2,805 Australian men and women aged 60 years and older living in the community for 16 years, showed that moderate alcohol consumption was one of the lifestyle factors associated with a reduced risk of developing dementia (Simons et al. 2006). This was in addition to regular physical and leisure activities especially daily gardening, and mental activities such as reading, playing board games and playing musical instruments. The study also showed that heavy alcohol consumption should be avoided.

The j-shaped relationship is also shown for younger and middle aged alcohol consumers. There is no data to suggest that long-term moderate alcohol consumption exacerbates age-related cognitive decline and impairment. An analysis of 15 scientific studies also suggests that moderate alcohol consumers later in life may have a 47% reduced risk of any dementias compared with abstainers.

ARE THE EFFECTS OF WINE ON COGNITIVE FUNCTION AND DEMENTIA RISK DIFFERENT FROM OTHER ALCOHOLIC BEVERAGES?

An analysis of 143 scientific studies that differentiated between the different types of alcoholic beverages suggested that wine was more protective than beer and spirits, although this finding was based on a relatively small number of studies. Wine consumers were also found to have better physical as well as mental health.

Proposed biological mechanisms are related to the effects of ethanol and phenolic compounds from wine on blood lipids and blood flow factors. There are also potential effects on the neurotransmitter acetylcholine, a chemical released by nerve cells in the brain to send signals to other cells such as those associated with memory. Phenolic compounds also decrease the amount of the peptide amyloid- β in the brain, which is a core component of the plaques found in brains affected by Alzheimer's disease.

There appears to be a relationship between the neuro-protective and cardio-protective effects of moderate wine consumption, given that reducing the risk of atherosclerosis and coronary heart disease also lowers the risk of cognitive decline. Atherosclerosis refers to the build-up of fats, cholesterol and other substances (plaques) in and on artery walls, which can restrict blood flow. These plaques can burst, triggering a blood clot. Although atherosclerosis is often considered a heart problem, it can affect arteries anywhere in the body.

CAN ANY NEGATIVE EFFECTS OF ALCOHOL ON THE BRAIN BE REVERSED?

Certain 'cognitive impairments' such as damage to short-term memory is reversible when alcohol consumption ceases. Studies suggest that alcohol acts on chemicals in the brain which transmit signals between brain cells to control learning and memory. If heavy alcohol consumption continues for decades, however, damage to short-term and prospective memory (the ability to remember) may be irreversible and a brain disorder called Wernicke-Korsakoff syndrome may develop where, without the ability to form new memories, new information is not remembered for more than a few seconds.

For more information about effects of wine consumption on human health, please contact the AWRI helpdesk on 08 8313 6600 or helpdesk@awri.com.au.

References and further reading

- Alzheimer's Australia. 2016. <https://www.fightdementia.org.au/about-dementia/statistics>
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- Stockley, C.S. 2015. Wine consumption, cognitive function and dementias – A relationship? *Nutr. Aging.* 3: 125-137.