



การบริโภคแอลกอฮอล์และการป้องกันภาวะสมองเสื่อม

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หน่วยประสาทวิทยา ภาควิชาอายุรศาสตร์ คณะแพทยศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ

บทคัดย่อ

แอลกอฮอล์มีผลต่อสมองทั้งในทางลบและทางบวก สำหรับประโยชน์ของแอลกอฮอล์ มีการบริโภคแอลกอฮอล์เพื่อลดความเสี่ยงต่อการเกิดภาวะสมองเสื่อม ข้อมูลของความสัมพันธ์ระหว่างการบริโภคแอลกอฮอล์และความเสี่ยงในการเกิดภาวะสมองเสื่อมนั้นไม่เป็นไปในทางเดียวกัน หลายการศึกษาแสดงให้เห็นถึงความเสี่ยงต่อการเกิดภาวะสมองเสื่อมที่ลดลงเมื่อบริโภคแอลกอฮอล์ในระดับน้อยถึงปานกลางเทียบกับการไม่บริโภคแอลกอฮอล์เลย อย่างไรก็ตาม บางการศึกษาไม่พบความสัมพันธ์ดังกล่าว หลายกลไกถูกนำมาอธิบายผลกระทบในทางบวกของการบริโภคแอลกอฮอล์ต่อสมอง การดื่มเครื่องดื่มแอลกอฮอล์ไม่ว่าจะเป็นเบียร์ ไวน์ หรือสุราในปริมาณหนึ่งถึงสองหน่วยต่อวันสามารถลดความเสี่ยงในการเกิดภาวะสมองเสื่อม ชนิดของเครื่องดื่มแอลกอฮอล์ไม่มีความแตกต่างอย่างมีนัยสำคัญต่อความสัมพันธ์ดังกล่าว โดยสรุปการบริโภคแอลกอฮอล์ในปริมาณหนึ่งถึงสองหน่วยต่อวันอาจสัมพันธ์กับความเสี่ยงในการเกิดภาวะสมองเสื่อมที่ลดลง

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Alcohol consumption and dementia prevention

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Abstract

Alcohol leads to both negative and positive effects on the brain. An advantage of alcohol is that it may reduce the risk of the dementia. The relationship between alcohol consumption and the risk of incident dementia is however not clear. Many studies have demonstrated that alcohol consumption in mild to moderate level, compared with abstention, lowers the risk of dementia. Other studies however do not suggest such association. There are several mechanisms to describe the positive effects of alcohol consumption on the brain function. One to two drinks daily of alcoholic beverages (beer, wine, or liquor) could lower the risk of dementia. The types of alcoholic beverages are not significantly different in such association. In conclusion, it would seem that a mild to moderate level of alcohol consumption might be associated with a lower risk of dementia.

Keywords: Alcohol, Dementia, Prevention

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■ Introduction

The World Health Organization (WHO) estimated that dementia contributes to 11.2 percent of years spent living with a disability in people aged more than 60 years¹. One study estimated that in 2001 there were 24.3 million people with dementia around the world². The cost of caring continues to rise for an increased number of patients³. This disease results in a total healthcare cost of more than 100 billion US dollars annually in the US⁴. Nowadays, there are still no effective treatments to cure Alzheimer's disease, the most common etiology of dementia. Moreover, there is still no evidence that any preventive strategies of such disease are effective. Alcohol is a neurotoxin. Chronic alcoholism in human beings is related to greater brain atrophy demonstrated by ventricular enlargement and widened cortical sulci on neuroimaging studies. Drinking heavily for days or weeks can lead to temporary cognitive impairment lasting for weeks to months⁴. Moderate consumption is however related to fewer silent brain infarction⁵ and is related to a lower risk of clinical stroke⁶. Thus, alcohol may have paradoxical and competing effects on the brain: on the one hand lowering the risk of cerebrovascular disease, but on the other hand acting as a neurotoxin⁷.

The role of alcohol intake to lower the risk of dementia is a challenging issue owing to this incurable disease. The aim of this review is to evaluate whether alcohol consumption can reduce the risk of dementia in the elderly. Firstly, the definition and causes of dementia are described. The amounts and levels of alcohol intake are identified in the second part. The last section provides the arguments and supporting evidence to consider the relationship between alcohol drinking and the risk of dementia.

■ Definition and Causes of Dementia

Dementia is defined as an acquired deterioration in cognitive abilities that impairs the successful performance of activities of daily living. Memory is the most common cognitive ability lost with dementia. In addition to memory, other mental faculties may be affected; these include language, visuospatial ability, calculation, judgment, and problem solving⁴.

Dementia is caused by several etiologies. Alzheimer's disease (AD) is the most common cause of dementia in the elderly. Degeneration of the brain cells contributes to the mechanism of such disease. The second most frequent cause is vascular dementia (VaD) the mechanism of which is an insufficiency of cerebral blood flow leading to brain ischemia or infarction. Other causes of dementia include dementia with Lewy bodies (DLB), Parkinson's disease dementia (PDD), chronic alcoholism, drug or medication intoxication, and normal pressure hydrocephalus (NPH). The major goals of dementia management are to treat correctable causes and to provide comfort and support to the patient and caregivers⁴. Unfortunately, Alzheimer's disease which is the main cause of dementia is incurable. As a result, symptomatic and supportive treatments play a major role in most dementia patients. In addition, there is no proven evidence of ways to prevent dementia. In the next section, the amounts and levels of alcohol consumption will be described.

■ Amounts and Levels of Alcohol Consumption

Alcohol consumption can lead to either advantages or disadvantages for health depending on the amounts of drinking. Ethanol is the major component of alcoholic beverages. The amounts

of one “standard drink” differ between countries. In the UK, one drink or unit is equal to 8 grams (g) of pure alcohol⁸. While one drink in the US is equal to 14-15 g alcohol which is equivalent to 12 ounces (oz) beer, 4 oz wine, or 1.5 oz (1 shot) of 80 proof spirit.

The cut-off points on levels of alcohol consumption to define “moderate” and “heavy” drinking also vary. In the US, the following parameters generally apply⁹: Moderate drinking, which has a low risk of alcohol problems, is defined as less than 2 drinks daily in women and less than 3 drinks daily in men. Heavy drinking, which is at risk for alcohol problems, is defined as more than 7 drinks weekly or 3 drinks per occasion in women and more than 14 drinks weekly or 4 drinks per occasion in men. The following section will demonstrate the relationship between alcohol consumption and dementia prevention.

■ Alcohol Consumption and Dementia Prevention

The data available on the relationship between alcohol consumption and the risk of incident dementia are inconclusive. Some studies do not suggest this association¹⁰⁻¹². Several studies have however demonstrated either a lower risk of dementia or a lesser decline of cognitive function over time with alcohol consumption compared to abstinence¹³⁻²⁶. These studies have been conducted in a wide geographical range including France, the Netherlands, Scotland, Ireland, Finland, Sweden, the USA, and the UK. Two of the studies are of meta-analysis type, eight are cohort type, two are case-control studies, and one is a cross-sectional type.

The Rotterdam study that was conducted in a cohort design that followed 5,395 people aged

55 years and older for 6 years and demonstrated that consumption of 1 to 3 alcoholic drinks daily was related to the lower risk of incident dementia²¹. A cross-sectional study in the US enrolled 2,215 women aged 40 years and older to find an association between alcohol use and the level of cognitive function. The result suggests that 1 drink weekly to 2 drinks daily of alcoholic beverages were associated with better cognitive function as compared with those who never drank alcohol²⁶. One case-control study in 4 US communities which enrolled 746 cases aged 65 year and older found that the risk of incident dementia was decreased in subjects who consumed 1 to 6 drinks of alcoholic beverages weekly as compared to abstainers¹⁸. One meta-analysis that examined 15 cohort studies was conducted on a sample including 14,646 participants evaluated for Alzheimer’s disease, 10,225 participants were evaluated for vascular dementia and 11,875 participants were followed for any types of dementia. The result of this meta-analysis indicated that light to moderate alcohol intake was associated with reduction in the risk of Alzheimer’s disease, vascular dementia, and any dementia as compared with alcohol abstinence in older adults¹³. All of these studies showed that mild to moderate alcohol consumption can prevent the development of dementia.

A number of mechanisms describe the effects of alcohol consumption upon the risk of dementia. Some laboratory evidence showed that the inflammatory mechanisms contributing to neuronal damage in Alzheimer’s disease was affected^{27,28}. For this reason, alcohol may play an anti-inflammatory contributory role²⁹. Alcohol might directly affect the cognition by stimulating release of acetylcholine, the neurotransmitter found in shortage in the brain of Alzheimer’s disease

patient^{30,31}. Moreover, a recent study demonstrated that ethanol can reduce the synaptic damage induced by beta-amyloid and synuclein³², which are established toxic substances found in the brain of Alzheimer's disease patient.

Levels of alcohol used to prevent the incident dementia varied from study to study. According to several studies, 1 drink per week to 4 drinks per day of alcoholic beverages (beer, wine, or liquor) can lower the risk of incident dementia¹⁴⁻²⁵. Nevertheless, the frequency of alcohol drinking 1 time per month can lead to lesser average

cognitive decline as compared with abstention¹⁶. In addition, there is evidence to suggest that alcohol consumption for more than 3 units per week without upper limit can delay the age-associated cognitive decline²³. Collins et al. demonstrated a U-shaped relationship of alcohol intake with the risk of dementia (Figure 1)³³. This relationship implies that the higher levels of alcohol intake up to 1 to 6 drinks weekly are associated with the lower risk of dementia while the reverse relationship is shown with alcohol intake for more than 6 drinks weekly.

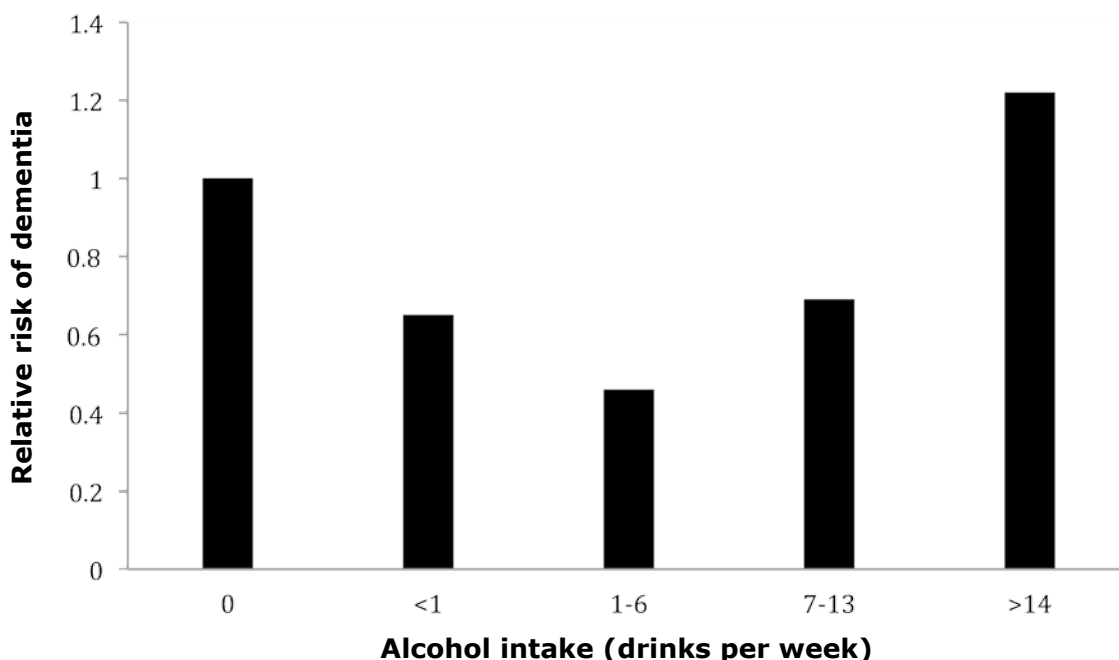


Figure 1 The bar graph shows the relationships of alcohol intake with risks of dementia. Long-term abstainers were the reference category. The vertical axis indicates relative risks for dementia.

The types of alcoholic beverages were not significantly different regarding the effect on dementia prevention in most studies¹³⁻²⁵. Some studies however identified a trend in favor of wine consumption to prevent the development of dementia¹⁴⁻²⁴. One cohort study in the Bordeaux area of France which followed 3,777 subjects aged

65 years and older over 3 years found that 3 to 4 drinks of wine daily contributed to a lower risk of dementia¹⁹. Another cohort study in the US which followed up 980 participants aged 65 years and older over 4 years suggested that only intake of up to three daily servings of wine was associated with a lower risk of Alzheimer's disease, not for other

types of dementia¹⁷. Wine contains resveratrol, a potent antioxidant agent that is not found in beer or spirits. These polyphenol molecules prevent oxidative damage to the brain cells by capturing free radicals. This concept may explain why such wine intake can prevent the development of dementia.

The effect of alcohol consumption on the lower risk of incident dementia did not obviously differ between men and women¹³⁻²¹. Interestingly, one cohort study enrolled 5,804 subjects aged 70-82 years from 3 different areas (Scotland, Ireland, and the Netherlands) and found that low to moderate levels of alcohol consumption can delay the cognitive decline only in older women, not older men²³.

The data mentioned above support the association between mild to moderate alcohol consumption and the prevention of dementia. There is however some evidence against such a relationship^{10,11,12,34}. One meta-analysis that examined 11 case-control studies of Alzheimer's disease was presented for alcohol consumption. The results suggested that low to moderate level of alcohol intake could not reduce the risk of Alzheimer's disease¹¹. One case-control study in East Boston, Massachusetts, the US which interviewed and clinically evaluated 513 subjects suggested that mild to moderate consumption of alcohol is not substantially related to the incidence of Alzheimer's disease¹². Broe et al. conducted a case-control study which enrolled 327 participants aged 75 years and older to consider the association of some health habits with dementia¹⁰. The results of this study demonstrated that there was no association between alcohol intake levels and incidence of dementia or Alzheimer's disease. Furthermore, Cooper et al. conducted a cross-sectional study in 1,735 subjects aged 60 to 74 years and found

that high-tier alcohol intake in people who were not problem drinkers was not associated with improved current cognition after controlling for premorbid intelligence and physical health³⁴.

The interpretation of many studies which supported the concept of dementia prevention from alcohol consumption might be limited by confounding factors. Alcohol consumption might benefit from psychological mechanisms rather than the properties of alcohol itself because there is evidence that suggested that alcohol intake was associated with higher social contact between older adults leading to a lower risk of dementia³⁵.

■ Conclusions

The evidence available on the relationship between alcohol consumption and the risk reduction of dementia are diverse. It would seem that mild to moderate level of alcohol consumption might be associated with a lower risk of dementia. There are several studies that have been conducted in various designs and geographical areas supporting this association. These include both clinical and laboratory studies. Nevertheless, the results of some studies did not show such association. Moreover, some researchers identified the limitation of the interpretation in previous studies. For example, the preventive effect on dementia might be caused by social engagement rather than the properties of alcohol itself.

Most evidence suggested that 1 to 2 drinks daily were the appropriate levels of alcohol intake to reduce the risk of dementia even though the others showed the lower or higher levels than that. Different types of alcoholic beverages would create the similar effects on the lower risk of dementia in most researches. However, some demonstrated the trend to favor wine. This might be explained by

the effects of antioxidant agent that is found only in the wine, not in the beer or spirit. One study reported that only older women benefited from low to moderate levels of alcohol consumption.

The available data are still inconsistent despite of the fact that many researchers found the association between mild to moderate levels of alcohol consumption and the lower risk of dementia

in the elderly. Hence, it would be recommended that moderate drinkers do not have to change their drinking habits for health reasons except in exceptional circumstances. Moreover, it should not be suggested to encourage young people to drink alcohol for dementia prevention due to lack of evidence in such that age group.

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