



Tobacco and Alcohol and the Risk of Cognitive Decline and Dementia:

Choices Make a Difference

What Is Already Known

A relationship between tobacco use and an increased risk of cognitive decline is well established. There is evidence that current smoking increases the risk of cognitive decline and dementia, quitting smoking may reduce a person's risk of cognitive decline to levels comparable to those of people who have never smoked, and heavy smoking in middle age may as much as double a person's risk of dementia in later life. However, the relationship between alcohol consumption and the risk of cognitive decline is less clear. The relationship may differ in people at different life stages, and the amount of alcohol a person typically consumes may also factor into the relationship. Thus, recommendations for people who drink will not be as straightforward as those for people who currently smoke.

Background and Evidence Base

Evidence for a relationship between tobacco use and cognitive decline

Results of a longitudinal study published in 2018 support a relationship between tobacco use and cognitive decline, and also show that long-term smoking cessation can reverse a person's risk of developing cognitive decline. In the study, when compared with continual smokers, long-term quitters and never smokers had a decreased risk of both overall dementia and vascular dementia. Never smokers additionally had a decreased risk of Alzheimer's disease compared with the risk for continual smokers.

Another study that examined the relationships among smoking, dementia, and death reported that current smoking increased the risks of both dementia and death and that some of the increased risk of death was attributable to dementia. The authors concluded that smoking cessation at any age might reduce these risks. Finally, it has been shown that even environmental exposure to tobacco smoke can adversely affect cognitive abilities. A study that used data from the Third National Health and Nutrition Examination Survey (NHANES III) reported an inverse association between environmental tobacco smoke exposure and cognitive deficits among children, even at extremely low levels of exposure.

Evidence for a relationship between alcohol consumption and cognitive decline

There is a more nuanced relationship between alcohol consumption and cognitive health than exists for tobacco use and cognitive health. Relationships vary depending on a person's age and the amount of alcohol a person typically consumes. The Lancet Commission reported that people who consumed more than two alcoholic beverages per day in midlife had an increased risk for later dementia, slower reaction times, and greater brain atrophy. Furthermore, a 2013 review concluded that excessive and prolonged use of alcohol may lead to permanent structural and functional damage. It also reported that abstinence after alcohol abuse may lead to recovery of some lost cognitive ability, perhaps due to remodeling in the brain that may overcome some of the structural damage caused by alcohol abuse.

In contrast, a 2009 systematic review and meta-analysis reported that individuals with light to moderate alcohol consumption had reduced risk of dementia and cognitive decline compared with both nondrinkers and heavy drinkers. Similarly, participants in a randomized trial who consumed a Mediterranean diet with an optional glass of wine per day showed small but statistically significant improvements in some measures of cognitive performance.

Although the relationship between alcohol use and cognitive health in adults remains unclear in some ways, adolescents are a group for whom the effects of alcohol use, and particularly of heavy alcohol use, are more straightforward. The Lancet Commission reported that alcohol abuse during adolescence was associated with particularly negative cognitive consequences, including brain structure abnormalities, deficits in memory and learning, poor academic performance, and disruption of brain maturation and plasticity. Furthermore, alcohol abuse in adolescence has been found to predict an increased risk of alcohol abuse later in life.

Implications for Public Health

Tobacco use and alcohol consumption are modifiable risk factors associated with the development of cognitive decline and dementia. With respect to tobacco use, it is clear that smoking increases the risk of dementia and



that smoking cessation can reduce this risk. Indeed, stopping smoking may be one of the best ways to reduce the risk of dementia in later life. Thus, current smokers comprise a group that could be targeted for smoking cessation interventions to reduce the risk of cognitive decline. People at any age who smoke, and especially those with young children in their household, should be provided with smoking cessation interventions. Smoking cessation provides many health benefits in addition to those for cognitive health.

With respect to alcohol consumption, the current evidence suggests that both a person's age and the amount of alcohol a person typically consumes affect the risks of cognitive decline and dementia. Adolescents who drink alcohol, and particularly those who abuse it, are a group that should be targeted for intervention, as alcohol abuse is particularly detrimental in this age group. Individuals at any life stage who habitually consume an excessive amount of alcohol should also be targeted for intervention, as alcohol abuse is strongly associated with cognitive decline. However, among adults at midlife and older, light to moderate drinking may protect against later cognitive decline. Therefore, while this group may not need intervention to reduce alcohol consumption, it may be appropriate to warn them of the risks associated with excessive drinking, emphasizing the importance of maintaining alcohol consumption in a beneficial range so that it does not develop into a problematic level of drinking.

Discussion

The evidence for a negative impact of tobacco on cognitive health, both among those who smoke tobacco and among those with environmental exposure to tobacco smoke, is strong. Because the relationship between cognitive health and alcohol consumption is less clear, whether intervention to reduce alcohol consumption is recommended should be considered in the context of a person's age and the amount of alcohol he or she typically consumes.

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