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# The Association Between Alcohol Use and Dementia in the Elderly

The association between alcohol use and dementia is complex and not all that well understood. Studies indicate that moderate alcohol consumption has a protective effect on the development of both Alzheimer's disease (AD) and vascular dementia (VaD). Heavy use increases the risk of developing VaD and alcohol related dementia (ARD), but not AD. Clinicians need to be aware of diagnosis and management of alcohol problems specifically relating to the elderly

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**T**he relationship between alcohol use and dementia in the elderly is complex. Moderate alcohol use may have a protective effect against the development of dementia. However, excessive consumption has been associated with an increased risk of dementia in the elderly. Given that anywhere between 2% and 10% of the elderly abuse alcohol or are alcohol dependent,<sup>1</sup> the societal impact of such behavior is significant.<sup>2</sup> For this reason, it is important for clinicians to be aware of their patients' alcohol consumption and how it may be impacting their cognitive functioning.

This paper focuses on defining alcohol consumption and describing the association between alcohol use and different types of dementia. The clinical presentation of alcoholism, pertinent investigations as well as intervention are

also discussed. It should be noted that our current understanding in this area has its limitations, and this has an impact on conclusions and recommendations.

## **The Issue of Alcohol Consumption**

Whether alcohol is beneficial or harmful depends upon the amount consumed. The elderly have a lower tolerance than younger individuals. Typically, blood alcohol concentration (BAC) is higher in the elderly for a number of reasons, including decreased metabolism and blood flow, decreased lean body mass and decreased body water.<sup>3</sup> Women have a lower tolerance than men due to significantly slower metabolism. In reviewing the literature, two factors make the comparison of data difficult. The definition of heavy alcohol consumption varies from one study to another.<sup>4</sup> Also, the

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definition of elderly can differ with an age range between 50 and 75 years. Light to moderate drinking is frequently defined as ranging between one and three drinks/day. However, in the U.S., consuming

proposed and validated by Oslin.<sup>6,7</sup> ARD is defined as “a significant deterioration of cognitive function sufficient to interfere in social or occupational functioning.” The definition is

with symptoms including a delirium and memory deficits, confusion and clinical signs such as ophthalmoplegia and ataxia. However, it should be noted that Wernicke Korsakoff syndrome often does not have a typical presentation.

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Pellagra is a rare condition associated with niacin deficiency and presents in the early stages with symptoms similar to physical disease or depression. More conclusive symptoms include confusion, hallucinations, paranoia, spastic weakness and a positive Babinski sign.

Very rare and occurring primarily in men, Marchiafava-Bignami Disease is associated with the degeneration of the corpus callosum and a variable presentation. Diagnosis of this condition is very difficult and although CT scans and MRI assist in clarifying the presentation, diagnosis is typically made post-mortem.

more than two drinks/day is considered heavy drinking and more than five drinks/day is termed very heavy drinking.<sup>5</sup> These definitions are further complicated by the fact that a standard drink constitutes a different amount of alcohol depending on the country where the study was conducted; the range is between eight and 13 grams of alcohol.

subdivided into probable and possible ARD depending on the association of alcohol use and dementia as well as other findings, including physical and neurological symptoms. Categories are also included in the definition and include mixed dementia, where multiple etiologies are possible and alcohol is a contributing factor. Alcohol use can either be protective against, or a risk factor in, the development of other forms of dementia, including Alzheimer’s disease (AD) and vascular dementia (VaD).

All of these conditions are largely related to nutrient deficiencies secondary to heavy alcohol use. ARD also includes dementia directly caused by alcohol consumption, although controversy remains as to whether this phenomenon exists.<sup>8</sup> This is because it has not been possible to clinically define this type of dementia as a separate entity from the Korsakoff symptom spectrum, and because there is no evidence for specific neuropathology.

### **The Relationship Between Alcohol Use and Dementia**

The relationship between alcohol use and dementia is complex and not very well understood.

Dementia may be either directly caused by alcohol use or secondary to alcohol use in the case of alcohol-related dementia (ARD). This definition has been

In the view of the current literature,<sup>6</sup> ARD encompasses a variety of etiologies, some of which will be described herein. Wernicke Korsakoff syndrome is the most common form of dementia related to alcohol use<sup>8</sup> and is associated

The impact of alcohol as a risk factor for other dementias is deter-

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mined by the amount consumed. Where individuals consumed between one and three drinks/day, the risk of dementia was decreased relative to abstinence.<sup>9</sup> Heavy alcohol use tends to increase the risk of developing dementia, but this has not been supported in all studies. A summary of major epidemiologic studies in the area of AD demonstrated no clear relationship between heavy alcohol consumption and an increased risk of developing AD.<sup>10</sup> Heavy alcohol use has been noted to increase the risk of developing VaD.<sup>11,12</sup> Genotyping research has been inconclusive. In some studies, individuals with an ApoE4 genotype who drank heavily were shown to be at greater risk of developing dementia than those who were negative for the genotype,<sup>13</sup> although the opposite was observed in other studies.<sup>9</sup> It should also be mentioned that a study done in Bordeaux showed that consuming up to four glasses of wine/day decreased the risk of developing dementia.<sup>14</sup> Similar findings were also reported by Cervilla.<sup>15</sup> Given that this would be termed heavy alcohol use, the most likely explanation for this apparent contradiction is that wine contains neuroprotective compounds such as resveratrol.<sup>16</sup>

### Signs and Symptoms of Alcohol Abuse

Alcohol abuse, as defined by DSM IV-TR, occurs where an individual experiences problems in various domains, including work, interpersonal interactions and the law, as a result of their

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drinking behavior, and continues to use alcohol. Alcohol dependence is associated with tolerance and withdrawal symptoms, as well as continued use despite persistent or recurring psychological or physical problems caused by the alcohol.<sup>17</sup> These criteria may be more difficult to apply to elderly individuals who are retired and somewhat isolated and yet may be experiencing negative consequences as a result of their drinking behavior. There are numerous direct and indirect consequences associated with heavy alcohol use. Clinicians need to be familiar with these, especially when a patient's presentation raises suspicion about alcohol abuse.

Signs and symptoms of alcohol abuse include cirrhosis of the liver,

hypertension, cardiac disease, gastrointestinal disorders and certain types of cancers. Neurological signs include that of a peripheral neuropathy and wide-based gait, secondary to cerebellar atrophy. Associated psychiatric disorders can include anxiety, depression

and insomnia. Nutritional deficiencies secondary to dietary neglect can affect vitamin B<sub>12</sub> and folate levels. Recurrent falls during periods of intoxication are associated with trauma, including head injuries and fractures.<sup>18</sup>

### Laboratory Investigations and Clinical Evaluations

As part of a clinical evaluation, it is important for clinicians to ask their patients about alcohol use.

Alcohol abuse is clearly underdiagnosed. A number of factors are responsible for this, including a lack of awareness on the part of clinicians as well as denial on the part of the patient. Quantity of alcohol consumed, frequency of use as well as symptoms meeting the criteria for abuse and depend-

### Summary Points

- Modest alcohol consumption can decrease the prevalence of AD and VaD.
- Heavy alcohol consumption is a risk factor for developing ARD and VaD.
- Treatment of alcoholism in the elderly can lead to an improvement of cognitive as well as physical symptoms.
- It is important for physicians to have an understanding of the diagnosis and management of alcohol abuse in the elderly.

ence need to be addressed. It has also been shown that instruments such as the CAGE and Michigan Alcohol Screening Test-Geriatric version (MAST-G) are valid in elderly populations.<sup>19</sup> If one is assessing a patient who is demented, collateral information is very important in making a diagnosis.

The most commonly used laboratory investigations are the gamma-glutamyltransferase (GGT) and the mean corpuscular volume (MCV). The carbohydrate deficient transferrin (CDT) is also used. These markers are useful in old age<sup>2</sup> with abnormalities demonstrated that are comparable to that of younger alcohol abusers.

### Late-onset vs. Early-onset Drinking

Evidence demonstrates that individuals who experience problems with alcohol late in life (onset after the age of 45 years) differ from those with early-onset problems (prior to the age of 25 years). The late-onset alcoholics were better able to achieve

abstinence, required fewer detoxifications, and had a lower alcohol consumption as well as lower psychiatric comorbidity compared to early-onset alcoholics. These differences contribute to a better treatment outcome.<sup>2</sup>

### Treatment Recommendations

Limited research indicates that treatment of elderly individuals with alcohol-use disorders can be beneficial.<sup>20</sup> Given the comorbidity of other disorders, and that withdrawal tends to be more severe and protracted than in younger patients, inpatient admission is recommended. Acute management should include medical stabilization, including the use of thiamine to prevent Wernicke Korsakoff syndrome. Benzodiazepines are also recommended as part of withdrawal management. Once an individual has been stabilized, psychological treatment should be commenced either on a residential or outpatient basis. Alcoholics Anonymous (AA) meetings can also be useful. Whether abstinence or harm

reduction (decreased consumption) are chosen depends upon an individual's ability to control their alcohol intake. A psychoeducational approach with the elderly is especially important given polypharmacy and potential interactions between the metabolism of alcohol and other drugs. Of significance is that, frequently, once an individual is able to achieve abstinence, cognitive impairment shows some degree of reversibility.<sup>21</sup>

### Practical Conclusions

It is important for clinicians to evaluate alcohol consumption in their elderly patients. Clearly, further research is required to resolve inconsistencies, develop more accurate assessments and understand the consequences of alcohol use. In moderation, alcohol use most likely has a protective effect against the development of AD and VaD. Heavy alcohol use leads to an increased risk of developing ARD and VaD. The relationship with AD is less clear. Physical sequelae are also a significant aspect of alcohol abuse. Alcohol abuse should be addressed with treatment strategies which will potentially lead to a significant improvement in cognition as well as physical symptoms. Clinicians need to be aware of diagnosis and management of alcohol problems specifically relating to the elderly.

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