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Frequent Alcohol Consumption Can Have Detrimental Health Consequences

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Abstract

Alcohols are derivatives of hydrocarbons and come in nature in several forms. When alcohol is mentioned, ethyl alcohol or ethanol is most often meant. Ethanol is the ingredient in alcoholic beverages, in which it can be found in various percentages. In spirits such as brandy, whiskey, vodka, there may be 20-55 volume percent ethyl alcohol. Liqueurs contain from 30 to 40 percent by volume, while less alcoholic beverages such as wine and beer contain from 2 to 12.5 percent by volume of ethanol. Ethanol, in addition to alcoholic beverages, is also used in medicine as a disinfectant, fixative and preservative preparation.

Keywords: *Alcohol, Metabolism, Drinking, Drinkers, Health*

Introduction

Alcohol (ethanol) is a drug, and health professionals should know something of its physiological and pathological effects and its handling by the body [1]. It is a small, water-soluble molecule that is relatively slowly absorbed from the stomach, more rapidly absorbed from the small intestine, and freely distributed throughout the body. Rate of absorption depends on a number of factors: it is quickest, for example, when alcohol is drunk on an empty stomach and the concentration of alcohol is 20–30%.

Alcoholic drinks are a major source of calories: for example, six pints of beer contain about 500 kcal and half a litre of whisky contains 1650 kcal. The daily energy requirement for a moderately active man is 3000 kcal, and for a woman it is 2200 kcal. Alcohol is distributed throughout the water in the body so that most tissues – such as the heart, brain, and muscles – are exposed to the same concentration of alcohol as the blood. The exception is the liver, where exposure is greater because blood is received direct from the stomach and small bowel via the portal vein. Alcohol diffuses rather slowly, except into organs with a rich blood supply such as the brain and lungs. Very little alcohol enters fat because of the latter's poor solubility, so blood and tissue concentrations are higher in women, who have more subcutaneous fat and a smaller blood volume, than in men, even when the amount of alcohol consumed is adjusted for body weight. Women also may have lower levels of alcohol dehydrogenases in the stomach than men, so that less alcohol is metabolised before absorption. Alcohol enters the fetus readily through the placenta and is eliminated by maternal metabolism. Blood alcohol concentration varies according to sex, size and body build, phase of the menstrual cycle (it is highest premenstrually and at ovulation), previous exposure to alcohol, type of drink, whether alcohol is taken with food or drugs such as cimetidine (which inhibits gastric alcohol dehydrogenase) and antihistamines, phenothiazines and metoclopramide (which enhance gastric emptying, thus increasing absorption).

Metabolism

Alcohol metabolism plays a key role in the biological and toxic effects of alcohol consumption on the human body [2]. The three main enzymes that carry out alcohol oxidation are alcohol dehydrogenase, cytochrome P450 2E1, and, to a lesser extent, catalase, all of which generate acetaldehyde.

The concentration of ethanol in alcoholic drinks ranges from approximately 800 mM in beer to over 8 M in hard liquor (50% ethanol). When consumed

orally, alcoholic drinks pass through the oral cavity and oesophagus to the stomach. Ethanol is slowly absorbed from the stomach, but rapidly absorbed from the small intestine. Only about 2–10% of the absorbed alcohol is eliminated via the lungs and kidneys; the remaining 90% is metabolized by enzymatic oxidation, mainly in the liver.

Unpleasant symptoms of headache, nausea, flushing and tachycardia are experienced by people who lack ALDHs (alcohol dehydrogenases) and who drink; this is believed to be because of accumulation of acetaldehyde [1]. Under normal circumstances, acetate is oxidised in liver and peripheral tissues to carbon dioxide and water.

On an empty stomach, blood alcohol concentration peaks about 1 h after consumption, depending on the amount drunk; it then declines in a more or less linear manner for the next 4 h. Alcohol is removed from the blood at a rate of about 15 mg/100 ml/h, but this varies in different people, on different drinking occasions, and with the amount of alcohol drunk. At a blood alcohol concentration of 20 mg/100 ml, the curve flattens out, but detectable levels are present for several hours after three pints of beer or three double whiskies in healthy people; enough alcohol to impair normal functioning could be present the morning after an evening session of drinking. Alcohol consumption by heavy drinkers represents a considerable metabolic load: for example, half a bottle of whisky is equivalent in molar terms to 500 g aspirin or 1.2 kg tetracycline.

Two mechanisms dispose of excess alcohol in heavy drinkers and account for 'tolerance' in established drinkers. Firstly, normal metabolism increases, as shown by high blood levels of acetate. Secondly, the microsomal ethanol oxidising system is brought into play; this is dependent on P450 cytochrome, normally responsible for drug metabolism, and other cofactors. This is called 'enzyme induction' and is produced by other drugs that are metabolised by the liver, and by smoking.

Drinking

Alcohol consumption is regarded as a leisure activity that is classified as a regular pastime associated with socialising with friends in bars, clubs and when out on dates or at parties [3]. Drinking alcohol is also linked to identification and conformity with a reference group. Getting drunk is regarded as an important feature of making new friends and for strengthening bonds with existing friends. Drinking alcohol in adolescence is also associated with young people having more freedom to choose what to do with their lives as they gain more autonomy from their parents. Drinking can be a hedonistic pleasure in its own right. It can also be used as a form of escape and as a coping mechanism when confronted with problems.

Generally, drinkers tend to report more positive than negative consequences of alcohol consumption. While younger drinkers tend to have a rosier picture of alcohol consumption than do older drinkers, older drinkers seem to be more willing to recognise the negative consequences that can accompany excessive drinking.

Social opinions about getting drunk have changed over time. Representations of drunkenness in the media are also signalled as playing a part in shaping public attitudes in this context. Social developments throughout the ages have created conditions under which alcohol consumption has been branded as acceptable or unacceptable. In pre-industrial Britain, it became fashionable to drink outside the home among the lower social classes and this was predominantly a male behaviour. Women who drank, particularly to excess, procured a negative social reputation for themselves. With industrialisation, working classes divided into two: those with skilled trades who sought to better themselves and those who remained unskilled for whom life was a struggle. The skilled working classes acquired affluence and also aspired to emulate the higher social classes not only through their growing wealth but also in terms of their behaviour. Drinking alcohol for this social group moved indoors into the private domain, while the unskilled working class continued to meet in public places to drink. For the latter, the alehouses often provided a more comfortable and hospitable space in which to spend one's time compared with the basic premises in which they tended to live. With class divides becoming more apparent, there was also a decrease in the extent to which the different classes shared the same recreational spaces.

Drinkers

People who develop alcohol problems usually struggle to process their feelings [4]. For some people this might represent a lifelong difficulty, for others the ability to know and express how they feel can be disrupted by

an accumulation of life events which are eventually experienced as overwhelming.

A less general but still prevalent feature among people who develop alcohol problems is that they tend to globalise their current mood, that is, to project it into the future and to allow it to colour the past. Thus a comparatively transitory mood, for instance of anxiety, depression or indeed optimism, can seem overwhelming or intractable, or even be imagined to be permanent, while it is being experienced. This is particularly likely in clients who experience significant mood swings, and could be described as a defining characteristic of problematic drinkers who also suffer from bipolar disorder. Such a propensity can contribute significantly to the likelihood of relapse, as a person experiencing an elevated mood may become over-confident and therefore less guarded about the possibility of relapse, while a lowered mood might seem so consuming and intractable that drink appears the only means of escape. Ironically the consumption of alcohol both exacerbates and perpetuates any tendency towards instability of mood.

Dependence

A diagnosis of alcohol dependence (AD) using the DSM-IV-R is categorical, based on an individual's manifestation of three or more symptoms from a list of seven [5]. AD risk can be traced to both genetic and environmental sources. Most genetic studies of AD risk implicitly assume that an AD diagnosis represents a single underlying genetic factor. Specifically, heavy use and tolerance versus withdrawal and continued use despite problems reflected separate genetic factors. However, some data suggest that genetic risk for AD is adequately described with a single underlying genetic risk factor.

Alcohol dependence involves both physical and psychological dependence [6]. The presence of physical dependence is shown when problem drinkers cease or reduce alcohol consumption. The alcohol withdrawal syndrome is a set of symptoms that individuals have when they suddenly stop drinking alcohol, following continuous and heavy consumption. Some individuals have tremors, seizures and hallucinations, typically occurring within 6 – 48 hours after the last alcoholic drink. Withdrawals can be mild, moderate or severe. For most problem drinkers, alcohol withdrawal will not progress to the severe stage of delirium tremens (confusion and hallucination). When an individual has severe withdrawal symptoms, this can be a life - threatening condition and requires supervision under medical care.

Assessment and care planning are a continuing process and a foundation for good clinical practice. It is only one of the stages in the systematic approach to care and interventions. The purposes of assessment are to:

- Gather information for the planning of care and health or social care interventions.
- Intervene in urgent medical and psychological problems.
- Provide feedback for the client on their level of substance misuse.
- Build a rapport with the client.
- Identify the areas that require interventions.

Individuals with alcohol and psychiatric problems have complex or multiple needs which are often difficult to assess comprehensively. Prior to undertaking a comprehensive assessment, there are some observations that may indicate substance misuse and/or mental health problem(s). This may warrant further investigations in the process of assessment.

How various potentials were realized depended on how alcohol was consumed, and perhaps the most important dimension of the history of alcohol lies in the persistent attempts of authorities to define the point at which moderate and therefore safe drinking crossed over to the excessive and dangerous [7]. In many cases, the point was defined only after the fact, when a drinker had passed it and become intoxicated. Excessive drinking was manifested in speech, physical coordination, and behaviors that were associated with intoxication. At other times, specific maximum volumes have been defined, as public health authorities in many countries now offer guidelines on maximum amounts of alcohol per day. In some cases, authorities have implemented prohibition policies that were universal, as in the case of Muslims and Mormons, or targeted at particular populations, such as indigenous peoples in colonized societies.

Comorbidity

Comorbidity of substance use and mental health disorders among older adults is particularly complex [8]. Given biological changes that occur as a natural

part of aging, many criteria used for identification of substance use or mental health disorders manifest differently in older adults compared to their younger counterparts. For example, older adults endorse AUD (alcohol use disorder) criteria differently than younger adults, suggesting an age-related bias. Criteria such as tolerance to alcohol or not fulfilling a role obligation may not apply to an older adult whose tolerance naturally reduces with age and whose number of roles may be reduced due to events such as retirement. Depressive symptoms also manifest differently among older adults, as they do not demonstrate sadness or depressed mood at the same rates or intensity as their younger counterparts. Similarly, bipolar disorder is often difficult to diagnose among older adults given that they are much less likely to manifest manic or hypomanic symptoms than younger adults.

Comorbidity in older adults manifests primarily via two distinct pathways. The first pathway is an adult who had one or more psychiatric disorders in early adulthood or middle age and has carried those through to older age. The second pathway is late onset, where the older adult experiences psychiatric symptoms, including an AUD, for the first time in later life. Historically, it has been assumed that those with early onset generally present with greater severity of psychiatric problems and more entrenched histories of addiction, which may be considered treatment resistant. For the older adult, however, biological vulnerabilities resulting from natural aging, in addition to chronic disease or maladies that tend to be more common in later years, create a complex picture of health for either pathway.

Neurotoxic Effects

Little doubt exists as to the neurotoxic effects of alcohol on the human nervous system, and multiple, though often mild, neuropsychological deficits have been documented in long-term chronic alcoholics [9]. People generally consider the most extreme alcohol related condition, Korsakoff's disease, as reflective of all individuals who abuse alcohol. It is important to note that although this disease occurs in some individuals, the majority of individuals who use alcohol chronically do not manifest this disorder. Clinical research on alcoholic patients is sometimes difficult to interpret given the varied subject populations and the length of use or abstinence in these subjects. Factors including age, past psychiatric history, history of head trauma, length and type of abuse, and premorbid medical status may greatly affect test results. Nevertheless, several patterns of behavioral alterations and neuropsychological deficits have been associated with alcohol use and abuse.

The acute neuropsychological effects of alcohol use are somewhat conflicting. At the time of acute intoxication, the alcohol abuser will generally present in a somewhat confused state with decreased attention and deficits in most cognitive areas assessed.

Individuals with chronic alcohol abuse display a wide range and variety of presentations of cognitive disorders, perhaps due to the numerous risk factors that contribute to neuropsychological deficits. Chronic alcoholics generally demonstrate a range of cognitive difficulties including mild deficits in visuospatial, perceptual, and graphomotor tasks, learning and memory, and tasks which require executive functions including abstraction, planning, and complex problem solving.

Violent Behavior

Many investigators have reported a close link between violent behavior, homicide, and alcohol intoxication [10]. Studies conducted on convicted murderers suggest that approximately half of the murderers were under heavy influence of alcohol at the time of the murder. When consumed in large quantities, alcohol may induce aggression and violent behavior by disrupting normal brain function. By impairing the normal information processing capability of the brain, a person can misjudge a perceived threat and may react more aggressively than warranted. Serotonin, a neurotransmitter, is considered to be a behavioral inhibitor. Alcohol abuse may lead to decreased serotonin activity, causing aggressive behavior. High testosterone concentrations in criminals have been associated with violent crimes. Adolescents and young adults with higher levels of testosterone compared to the general population are more often involved in heavy drinking and consequently violent behavior. Young men who exhibit antisocial behavior often "burn out" with older age due to a decreased level of testosterone and an increased level of serotonin. By modulating serotonin and testosterone concentration, alcohol may induce aggressive and violent behavior when consumed in excess. Alcohol abuse by a husband may be related to husband-to-wife marital violence. Studies have shown a link between alcohol

abuse by a husband before marriage and husband-to-wife aggression in the first year of marriage. The most violence abuse occurs in the first year of marriage in cases in which the husband was a heavy drinker before marriage and the wife was not.

Any study on alcohol use and its link to violence benefits from a consideration of the way in which the law, and, in particular, the criminal justice system, responds to alcohol-related violence [11]. Violence is generally perceived as a harm that warrants criminalisation. But the limits of the criminal law, and hence the criminal justice system, have to be recognised from the outset. An offence is a defined (though sometimes contested) legal construct and the definitional process means that only certain forms of violence constitute criminal activity: certain types of sporting activity, for example, are permissible. Even if the theoretical availability of a legal response does exist, comparatively few crimes are reported to the police; not all crimes reported are subsequently recorded, and, of those that are, the vast majority do not lead to a conviction.

Public Health

The definition of alcohol policy proposed relies heavily on concepts derived from public heath, a specialized field of knowledge and action that is not always understood by either the general public or the health professions [12]. Public health is concerned with the management and prevention of diseases and injuries in human populations. Unlike clinical medicine, which focuses on the care and cure of disease in individual cases, public health deals with groups of individuals, called populations. The value of population thinking in alcohol policy lies in its ability to identify health risks and suggest appropriate interventions that are most likely to benefit the greatest number of people. The concept of 'population' is based on the assumption that groups of individuals exhibit certain commonalities by virtue of their shared characteristics (e.g. gender), shared environment (e.g. village, city, nation), or shared occupations (e.g. alcoholic beverage service workers) that increase their risk of disease and disability, including alcohol-related problems. Because populations defined by geographic boundaries are often not homogeneous, it is sometimes fruitful to focus on subpopulations rather than total populations.

Why are public health concepts important to the discussion of alcohol policy? During the twentieth century public health measures have had a remarkable effect on the health of populations throughout the world. Life expectancy has increased dramatically worldwide during this period, thanks to the application of public health measures designed to improve sanitation, reduce environmental pollution, and prevent communicable and infectious diseases. But even as epidemics of infectious and communicable diseases have receded, health risks associated with lifestyle behaviours and chronic diseases have increased in importance as major causes of mortality and morbidity. When population approaches are used instead of, or in conjunction with, individual level medical approaches, the effects on health and disease are much greater. Public health concepts provide an important vehicle by which to manage the health of populations in relation to the use and misuse of alcohol. Whereas medical approaches oriented toward individual patients can be effective in treating alcohol dependence and alcohol-related disabilities, population-based approaches deal with groups, communities, and nation states to improve the allocation of human and material resources to preventative and curative services. They also provide epidemiological data to monitor trends, design better interventions, and evaluate programmes and services.

Conclusion

All alcohols are poisons by nature. Some forms can cause blindness by consuming only small amounts. Ethyl alcohol, on the other hand, can be harmful and even deadly if consumed in large quantities over a short period of time. Small amounts of alcohol, such as those in a can of beer, a glass of wine or a glass of spirits can also have a detrimental effect. Just a few minutes after consuming alcohol, the concentration of alcohol in the blood begins to rise. It slows down the flow of signals between nerve cells and thus affects a person's physical and mental activities. Approximately 20 percent of ethanol is absorbed into the bloodstream directly from the stomach, and the remaining 80 percent from the small intestine. Because ethanol is highly soluble in water, it is mainly distributed in water-rich tissues, such as muscle, and less so in fat-rich tissues. This is why women are more sensitive to alcohol, since their body contains less

water and more fat, and the same amount of alcohol must be distributed in a smaller amount of water in the body. Ethanol, like everything else we drink and eat, is broken down in the body by metabolism. One part of alcohol can be used as a source of energy and converted into other substances, such as fat tissue, one part is broken down to water and carbon dioxide, while a small part is excreted unchanged, through urine or breath.

References

[1] Paton, A.; McCune, A. (2015.): „Alcohol in the body" in McCune, A. (ed): „ABC of Alcohol, Fifth Edition", John Wiley & Sons, Ltd., Chichester, UK, pp. 12. – 13.

[2] Brooks, P. J.; Zakhari, S. (2013.): „Alcohol metabolism and genetic control" in Boyle, P.; Boffetta, P.; Lowenfels, A. B.; Burns, H.; Brawley, O.; Zatonski, W.; Rehm, J. (eds): „Alcohol - Science, Policy, and Public Health", Oxford University Press, Oxford, UK, pp. 173. – 174.

[3] Gunter, B.; Hansen, A.; Touri, M. (2010.): „Alcohol Advertising and Young People's Drinking - Representation, Reception and Regulation", Palgrave Macmillan, Basingstoke, UK, pp. 26. – 27.

[4] Fox, M.; Wilson, L. (2011.): „Counselling Older People with Alcohol Problems", Jessica Kingsley Publishers, London, UK, pp. 33.

[5] Crabbe, J. C.; Kendler, K. S.; Hitzemann, R. J. (2013.): „Modeling the Diagnostic Criteria for Alcohol Dependence with Genetic Animal Models" in Sommer, W. H.; Spaagel, R. (eds): „Behavioral Neurobiology of Alcohol Addiction", Springer-Verlag, Berlin,Germany, pp. 187.

[6] Rassool, G. H. (2010.): „Addiction for Nurses", John Wiley & Sons Ltd, Chichester, UK, pp. 76. – 77.

[7] Phillips, R. (2014.): „Alcohol - A History", The University of North Carolina Press, Chapel Hill, USA, pp. 520.

[8] Kuerbis, A.; Chernick, R.; Gardner, D. S. (2016.): „Alcohol Use and Comorbid Psychiatric and Subsyndromal Disorders Among Older Adults" in Kuerbis, A.; Moore, A. A.; Sacco, P.; Zanjani, F. (eds): „Alcohol and Aging - Clinical and Public Health Perspectives", Springer International Publishing AG, Cham, Switzerland, pp. 36.

[9] Gruber, S. A.; Yurgelun-Todd, D. A. (2000.): „Neuropsychological Correlates of Drug Abuse" in Kaufman, M. J. (ed): „Brain Imaging in Substance Abuse - Research, Clinical, and Forensic Applications", Humana Press Inc., Totowa, USA, pp. 201. – 203.

[10] Dasgupta, A. (2015.): „Alcohol and Its Biomarkers - Clinical Aspects and Laboratory Determination", Elsevier, San Diego, USA, pp. 25. – 26.

[11] Dingwall, G. (2013.): „Alcohol-Related Violece as Alcohol Related Crime: Policing, Policy and the Law" in McMurran, M. (ed): „Alcohol-Related Violence - Prevention and Treatment", John Wiley & Sons Ltd, Chichester, UK, pp. 105.

[12] Babos, T.; Holder, H.; Caetano, R.; Homel, R.; Casswell, S.; Livingston, M.; Edwards, G.; Österberg, E.; Giesbrecht, N.; Rehm, J.; Graham, K.; Room, R.; Grube, J.; Rossow, I.; Hill, L. (2010.): „Alcohol - No Ordinary Commodity - Research and Public Policy, Second Edition", Oxford University Press, Oxford, UK, pp. 7. – 8.

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