4 The Effects of Alcohol on the Body

Aims and learning outcomes

This chapter introduces the positive and negative effects of alcohol on the human body by providing a good basic knowledge of how it works its way through the body and its vital organs. It explores blood alcohol concentration and their effects on a typical individual, which can include the alcohol hangover. It also highlights safe drinking guidelines and the impact of alcohol consumption on sexual and sporting performance and the subsequent risk taking behaviours associated with alcohol consumption. After reading this chapter you should be able to:

- Demonstrate knowledge of blood alcohol concentration levels and their associated behavioural effects.
- Explain how alcohol works its way through the human body from its absorption through to its final elimination.
- Outline the specific effects of alcohol on women, men, pregnant women, old and young people and individuals with certain genetic predispositions.
- Demonstrate a good basic knowledge of safe drinking guidelines and the impact of alcohol consumption on sexual and sporting performance.

4.0 Introduction

Alcohol is enjoyed by many people globally because of its relaxing properties, its ability to intensify sociability, and as a complement to meals. Although alcohol has positive effects, unfortunately it can also create problems for some individuals who misuse it and drink it to excess. The effects of alcohol on the body are numerous; these effects can however differ in individuals due to their gender, age, their physical and medical condition, their mental health status and their genetic predisposition. Alcohol has different effects on men

and women due to differences in their genetic predisposition, their body mass, the way alcohol is broken down in the body and the relative proportions of water and fat in male and female bodies. Women will experience the full effects of consuming alcohol at lower levels than men. Age is also an integral component in determining the effects of drinking in both young people and older adults. The intoxicating properties of alcohol can be very seductive and unfortunately additive. When consumed to excess alcohol can harm the body in many ways including death. In this chapter we explore the effects of alcohol on the body by initially tracing its path through the human body and it effect on the body's vital organs. The factors which mediate alcohol's effect on women, young people and older adults will also be explored. Finally we will highlight the impact of alcohol on sexual behaviour and the association between performance and alcohol in sport.

4.1 Effects of alcohol

Alcohol acts on the brain as an anaesthetic, sedative, and stimulant, depending on how much of it is consumed. The effects of alcohol change the more you consume. Many people drink alcohol for these effects. It is important to know that drinking in excess can also be extremely harmful. Professor George Bakalkin (2008) maintains that the social problems arising from excess drinking are serious, caused by the pathological changes in the brain and the intoxicating effects of alcohol. Some of the more serious problems caused by alcohol abuse include child abuse, domestic violence, rape, burglary, assault and other criminal offences (Isralowitz, 2004), and loss of employment (Langdana, 2009) which can lead to financial problems. Drinking at inappropriate times, and behaviour caused by reduced judgment, can have legal consequences, such as criminal charges for drunk driving or public disorder, or civil penalties for tortious behaviour, and may lead to a criminal sentence (Glifford, 2009).

In relatively small amounts alcohol can:

- impair your overall coordination and slur your speech
- create the need to urinate more than usual
- make you light-headed and dizzy
- dilate blood vessels in the skin, making it look red and flushed as more blood comes to the surface – bloodshots eyes are another example of this
- increase sweating, which is directly associated to the dilation of your blood vessels
- increase body temperature, as your brain is struggling to control levels
- upset your stomach lining

- lower your inhibitions, change your mood and normal behaviour
- increase your heart rate

The outcomes of these experiences can differ from person to person, but the most obvious effect is usually the lowering of inhibitions and changed behaviour which can make some individuals appear to be more friendly and extroverted. This effect is why it is traditionally described as a social enhancer. There are also potentially negative effects, which include increased displays of boldness and an increased desire to be promiscuous. A smaller number of people can become aggressive and violent after consuming even small quantities. Heavy consumption sessions can also lead to experiences of irritability, euphoria, and diminished control of bodily movements leading eventually to unconsciousness. If they have been drinking up to and beyond a certain point, they may fall into a coma. At extreme levels of drinking, people may die of acute alcohol poisoning.

Case example: Alcohol death by misadventure

Barman died of alcohol poisoning

In 2011 a 23 year old barman died following an after-hours drinking session. The deceased man, who had been enjoying drinks while playing poker and pool in a social club with friends, died of acute alcohol intoxication. Friends stated that they raised the alarm when they were unable to wake the man who fell asleep on a couch. A post-mortem exam found he had consumed a fatal level of alcohol with 499 milligrams of alcohol per 100 milligrams of blood in his system. The Court Coroner stated that the problem was the proof of some of the drinks consumed on top of other alcohol consumed during the drinking session. These drinks included Chartreuse, a French liqueur with an alcohol content of 55% alcohol by volume. The coroner recorded a verdict of death by misadventure (O'Halloran, 2011).

Methanol, a by-product of the alcohol production process, can be found sometimes in beverages that are not carefully controlled for quality (i.e. home produced, illegal and very cheap spirits). Drinking methanol can lead to intoxication but it also leads to dangerous consequences. Methanol is broken down by an enzyme that converts it into formaldehyde, a chemical used to preserve biological specimens. Since this enzyme is present in the human eye, the formaldehyde 'fixes' the eye tissue, causing permanent blindness (Schep et al 2009). Drinking even small amounts of methanol is extremely dangerous and methanol contamination of alcoholic beverages has been known to poison and kill people.

Case example: Poisonous alcohol

Holidaymakers killed by tainted illegal alcohol

In 2009 a 25 year old female graduate student and a 59 year old man died in Indonesia after drinking homemade liquor laced with a toxic chemical, in a scandal that claimed 25 lives. Both of the deceased passed away after consuming arak palm wine that was spiked with methanol, while holidaying on an islet off the island of Lombok and Bali. Indonesian authorities have responded to the poisonings by cracking down on home distillers of arak, a cheap and potent spirit that is popular with tourists in cocktails. Alcohol is heavily taxed in Indonesia, the world's most populous Muslim nation, and the high prices have spawned a huge black market for wine and liquor (Mail Foreign Service, 2009).

Drink Aware

The Drink Aware trust works at increasing awareness and understanding of the role of alcohol in UK society, enabling individuals to make informed choices about their drinking. It aims to challenge the national drinking culture to help reduce alcohol misuse and minimise alcohol-related harm. If you are supplying alcohol to the public in any way, you should check your own local government agency or relevant trade body's 'Code of Practice' and ensure that you and other staff members are familiar with your responsibilities in your own market.

4.2 Alcohol's path through the body

Absorption

Alcohol has very small molecules, and these are absorbed into the blood. Normally, this takes place in the small intestine, but, in theory, if you were to fill your mouth with, for example, a small measure of brandy without swallowing it, the alcohol would still be absorbed into your blood through the lining of your mouth. The stomach absorbs 20% of the alcohol, and the remaining 80% is absorbed by the small intestine. The speed at which alcohol is absorbed depends on several factors, which include:

- the alcohol concentration in the beverage – the higher the concentration, the faster the absorption,
- the type of drink – fizzy drinks help to speed up the absorption of alcohol
- if the stomach is full or empty – food slows down alcohol absorption.