ALCOHOLIC LIVER DISEASE IN YOUNG PEOPLE

Yaso Shan examines the effects of alcohol on the liver and looks at treatment options including damage limitation and complementary therapies

Summary

This article will highlight the physical consequences and physiological damage of the growth in alcohol use, particularly in young people. It will examine the importance of liver function and its vital role in health and wellbeing and discuss the effect of alcohol on liver function, and the pathophysiology of alcoholic liver disease. It will examine the nutritional and herbal contribution to maintaining or restoring liver function and will look at ways to optimise health, wellbeing and vitality, in which the liver has a critical role.

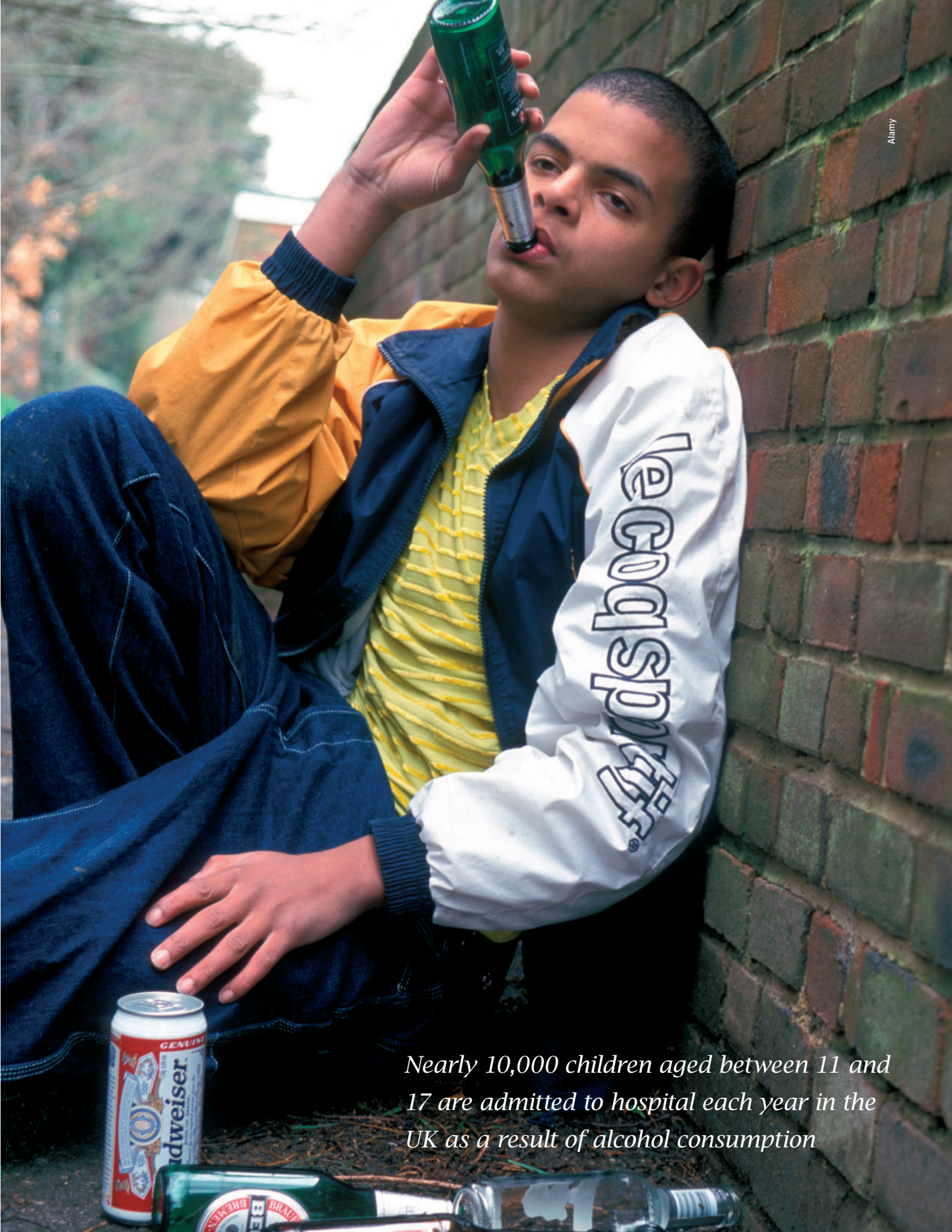
Keywords
Alcohol and alcoholism, liver disorders, herbal medicine, nutrition and diet

THE IMAGE of the middle-aged alcoholic suffering the physiological and social consequences of alcoholic liver disease (ALD) is being replaced by a growing statistic of a much younger generation. Examples of this trend include the death of a 24-year-old female with advanced liver cirrhosis, a 19-year-old female with end-stage liver disease, a 25 year old diagnosed with advanced alcoholic cirrhosis and the death of a 21 year old from acute alcohol poisoning to name but a few (Jeffreys 2007).

This depressing snapshot of the youth culture in Britain today could easily represent the long-term neglect of children, a legacy of many years of lax drinking laws, sale of cheap alcohol, the less than rigorous punitive action on its sale to those aged under 18 and poor government guidelines on alcohol. Many campaigners have argued that limited legal restrictions and a lack of tough penalties for under-age and binge drinking have contributed. Changes in society, where young people can no longer aspire to jobs or affordable education, and have limited access to sporting activities due to rising costs and the pressures of increasing levels of debt, may have encouraged this trend. It could be argued that young people have become disenfranchised, marginalised, disenchanted and disconnected from mainstream society.

More worrying is the culture of acceptability of drinking in British society. The UK has one of the highest rates of underage drinking in the industrialised world (Godlee 2009). In 2006, there was an increase of more than 40 per cent in young people aged between 25 and 29 years dying of liver disease than in the previous year (British Liver Trust 2008). Statistics for 2007 reveal four men and one woman in the 20 to 24 age group, and 24 men and 16 women aged between 25 and 29, dying of ALD (Office for National Statistics 2008). In England alone, there were 6,541 deaths directly related to alcohol. This was a rise of 19 per cent since 2001. Of these deaths, the majority (4,249) died from ALD (British Liver Trust 2008)

There were 38,300 hospital admissions in 2007/08 with a primary diagnosis of ALD, and the number of alcohol-related admissions for the same period was 49,300 in the 16 to 24 age group (British Liver Trust 2008). Of increasing concern is the level of drinking among teenagers, particularly those of school age. Children are starting to drink alcohol as young as nine and ten years of age and in groups. Young people drinking in public places is most likely to be of concern to the public. In one survey more than half the people who said they had witnessed drunken or rowdy



Alamy

Nearly 10,000 children aged between 11 and 17 are admitted to hospital each year in the UK as a result of alcohol consumption

Table 1 Three stages of alcoholic liver disease

Stage 1	Fatty liver (minimal change)	Also known as steatosis, the earliest stage of ALD. Heavy drinking for as little as a few days can lead to a 'fatty liver'. Excessive build up of fat inside liver cells (hence the term). It is a reversible condition only if drinking stops. It is not linked to deterioration of liver function though it may produce abnormal liver function tests (LFTs).
Stage 2	Alcoholic hepatitis	Effects of this condition may be mild but may also be life threatening. It is caused by drinking heavily for much longer periods producing inflammation of the liver, shown in abnormal LFTs. Symptoms include jaundice, vomiting, fever, abdominal pain and distension and sometimes mental confusion. It is a reversible process but continued drinking will lead to Stage 3 (cirrhosis).
Stage 3	Cirrhosis	The final irreversible stage of ALD and is characterised by scarring of the liver (fibrosis) where healthy liver cells are replaced by scar tissue leaving the liver unable to perform its functions. There is also development of liver nodules.

behaviour claimed it was due to young people drinking in public places (Hughes *et al* 2008).

There is a strong association between alcohol and accidents involving young people, particularly road traffic accidents. Nearly 10,000 children aged between 11 and 17 are admitted to hospital each year in the UK as a result of alcohol consumption, with 6,000 of these aged between 11 and 15. The reasons include alcohol poisoning and injuries (Department for Children, Schools and Families 2009). Deaths from liver disease are now occurring at much younger ages than have previously been seen (Newbury-Birch *et al* 2008).

The increase in death rates from ALD is thought to be a consequence of drinking alcohol starting at an early age. Pitkanen *et al* (2005) found that people who started drinking at age 13 or younger had significantly increased frequency of alcohol use and binge drinking in adulthood than those who started later.

There is evidence that those who start drinking when they are teenagers are more likely to develop a dependence on alcohol later in life (Bonomo *et al* 2004). Moreover, there are strong links between drinking high levels of alcohol and youth offending, teenage pregnancy, truancy, increased risk of sexually transmitted infections and exclusion from school (Department for Children, Schools and Families 2008). While the numbers of teenagers drinking in the UK have declined in recent years, those who do drink are consuming more alcohol (Department for Children, Schools and Families 2008).

Table 2 Conventional treatment strategies in alcoholic liver disease

Fatty liver	Alcoholic hepatitis	Cirrhosis
Abstinence	Abstinence Nutritional support Hospital admission Steroid treatment	Abstinence Nutritional support Hospital admission Symptom-based treatment Liver transplant

Liver pathology

The liver is the largest and one of the most important organs in the body and yet it is poorly emphasised in health promotion and looked after. It performs more than 500 functions and its capacity for repair and regeneration is phenomenal considering the demands placed on it. The liver is among the few internal human organs capable of natural regeneration of lost tissue – as little as 25 per cent of remaining liver can regenerate into a whole liver again.

One of the crucial aspects of liver function is its role in detoxification. It is instrumental in ensuring that all toxins and potentially harmful products of metabolism are rendered safe so that the body can eliminate them before they accumulate in the blood and tissues. The liver is particularly vulnerable to alcohol-related injury due to its detoxification function in processing alcohol. ALD is classified into three stages although the progression of these stages is variable (Table 1).

The risk of liver cancer (hepatocellular carcinoma or HCC) increases with cirrhosis, of which alcohol is one of the biggest causes (Kumar *et al* 2003). Hepatitis C viral infection (HCV) is particularly common in alcoholics with liver disease (Coelho-Little *et al* 1995, Takase *et al* 1993) and chronic hepatitis C infection is a major risk factor for HCC.

Other factors which may influence ALD development include demographic and biological factors such as ethnic and

Table 3 Treatment of decompensated cirrhosis based on symptoms

Bleeding varices	Endoscopy treatment to destroy abnormal veins. Long-term treatment thereafter with β-blockers, such as propranolol, reduces the risk of further bleeding.
Ascites	Treatment with diuretics and advised to reduce salt and fluid intake. Some cases may require drainage via a catheter in the abdomen.
Encephalopathy	Invariably caused by increased levels of ammonia in the brain and requires treatment of the underlying cause (which can vary from medication, gastrointestinal bleeding, electrolyte imbalance to infection or constipation). Lactulose (liquid laxative) is sometimes prescribed to reduce the production of ammonia in the blood.
Complications	Complications with continued deterioration of function can occur despite abstinence from alcohol. This is because the damage is so severe, the complications are profound and only a liver transplant will save the patient. The criteria for transplantation in end-stage liver failure are: ■ Abstinence from alcohol (prior psychological assessment to determine compliance). ■ Advanced liver disease with complications. ■ No other organ damage. ■ Good social or family support.

racial background, gender, age, education, income, employment and a family history of drinking problems (Jones-Webb 1998).

Diagnosis

In advanced cases of stage 2 and stage 3 ALD, there can be obvious signs and symptoms such as jaundice which may point to a diagnosis. However, only a liver biopsy can most accurately determine the stage of ALD and confirm that alcohol is the cause of it. Supportive information can be provided from liver function tests (LFTs) to determine levels of three key liver enzymes:

- Gamma-glutamyl transferase (GGT).
- Aspartate aminotransferase (AST).
- Alanine aminotransferase (ALT).

Liver disease is confirmed if there is an increase in the concentration of GGT, and the ratio of AST to ALT is greater than 2:1 as is found to be the case in 80 per cent of cases (National Institute on Alcohol Abuse and Alcoholism 2005).

Although an increase in GGT is the best indicator of excessive alcohol consumption, it is also present in many organs and is increased by other drugs. Other tests are required to make a definitive diagnosis of ALD. Ultrasound scans can create an image of the liver and surrounding organs, which helps in taking a liver biopsy. The scan can also assess the severity of the disease and eliminate other common causes of abnormal LFTs such as gallstones.

Symptoms of ALD also present in other diseases such as viral hepatitis (including hepatitis B and hepatitis C), haemochromatosis (an inherited disorder of iron metabolism), Wilson's disease (an inherited disorder of copper metabolism) and autoimmune hepatitis.

Treatment

Treatment of ALD depends on the extent of the disease and the damage to the liver. In cases of compensated liver, where the liver is still able to perform some or all of its functions, the treatment or management of the disease involves abstinence from alcohol combined with nutritional support (Table 2). In cases of decompensated liver disease, the treatment plan in Table 3 is usually adopted although each case is regarded in detail.

Alternative medicine

Complementary and alternative medicine (CAM) offer prevention strategies and ways to optimise liver health. A congested and over-burdened liver cannot function efficiently and must be addressed as part of any treatment plan, particularly in older people where digestive problems can be acute due to the decline in digestive function with age. There are a number of herbs that can address poor liver functioning which will indirectly improve digestive function as a result (Table 4 page 20).

Certain herbs such as milk thistle and artichoke have a broad action on the liver – assisting, supporting, toning, strengthening and even protecting it (Al-Anati *et al* 2009, Post-White *et al* 2007, Miccadei *et al* 2008). These herbs are described generally as hepatics and hepatoprotectives. Some herbs directly improve bile

Table 4 Examples of liver herbs

Science Photo Library/iStock

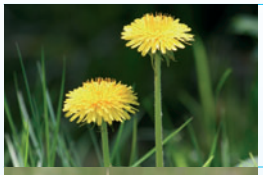
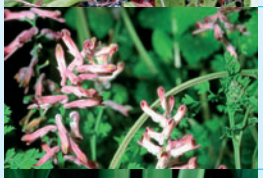
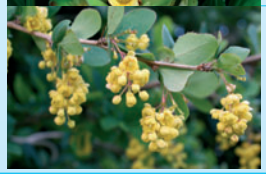
	Herb	Action
	Dandelion (*Taraxacum officinale*)	Mild laxative (root) Diuretic Increases appetite (bitter herb) Raises bile production and secretion
	Milk thistle (*Silybum marianum*)	Protects liver cells from damage Aids repair and regenerationof liver cells
	Artichoke (*Cynara scolymus*)	Protects liver cells Increases appetite (via bitter action) Raises bile production A general liver tonic
	Chinese magnolia vine (*Schisandra chinensis*)	Protects liver against damage Detoxification properties
	Fumitory (*Fumaria officinalis*)	Normalises bile production and secretion
	Turmeric (*Curcuma longa*)	Improves detoxification role of liver Raises bile production
	Barberry (*Berberis vulgaris*)	Raises bile production Improves poor liver function Improves poor gut function (indirectly)

Table 5 Foods that are good for the liver

Vegetables	Fruits
■ Brassicas (cabbage, brussels sprouts, broccoli, horse radish) ■ Artichoke (globe and Jerusalem) ■ Beetroot ■ Alfalfa sprouts ■ Herbs and spices (garlic, fennel, parsley, onions) ■ Watercress	■ Apples ■ Grapefruit ■ Grapes ■ Lemons ■ Pears ■ Apricots ■ Avocado ■ Pineapple and papaya ■ Watermelon

(Williams 1998)

production by the liver or its release from the gall bladder. Other herbs can influence the regeneration process, improving its efficiency and functioning. Some herbs are directly involved in the biochemical detoxification pathways that render toxic chemicals and by-products of metabolism less harmful and suitably safe for elimination (Mills and Bone 2000).

Herbal detox and fasting

Most detoxification programmes involve some aspect of boosting liver performance and digestive function in its elimination of waste material. A poorly performing liver will not detoxify substances effectively and there is a danger of toxic load to the cells (Mills and Bone

2000), so a herbalist may prescribe herbs such as turmeric or schisandra. To protect the liver from further damage, milk thistle may also be prescribed. Some vegetables, such as the brassicas –broccoli, brussels sprouts, cabbage, horse radish etc, contain enzymes that have been shown to possess certain cancer-preventing properties in addition to boosting liver detoxification activity (Arbos *et al* 2008, Smith *et al* 2004). Table 5 lists fruit and vegetables that are good for the liver.

Nutritional supplements

People who abuse alcohol can become malnourished. A preoccupation with alcohol, and the nature of addiction, means that little attention is paid to eating, especially the right kinds of foods. Deficiencies can occur with all the macronutrients (carbohydrates, proteins and fats), vitamins A, C and B (especially B1 thiamine) and minerals such as calcium and iron. Brain damage from B1 deficiency (Wernicke-Korsakoff syndrome) can be reversed to some extent through supplementation (National Institute on Alcohol Abuse and Alcoholism 2005).

Most clinicians aim to help people achieve the recommended balanced diet after addressing any pressing and immediate nutritional deficiencies. Antioxidants are also suggested because they combat the oxidative stress which plays a role in the development of ALD.

Other measures health professionals can explore include:

- Counselling and psychological interventions can explore addictive behaviour – for example, alcohol could be masking other problems.
- Limiting toxin exposure by advocating a nutritious diet and a healthy lifestyle which incorporates exercise and relaxation.
- Practical support and advice. There may be scope for adopting a hobby, pastime or recreational pursuits that can replace alcohol.
- Joining a self-help group and volunteering services in the local community can help because offering help to charities can free people with alcohol problems from their own addiction and anxieties.

Conclusions

Educating and informing young people and their parents of the dangers of excessive drinking is crucial. Parental inclusion in addressing problems is vital because they may also need help.

The culture of acceptability of drinking, particularly binge drinking and drinking to oblivion, must change. In Mediterranean countries young people tend to drink alcohol in moderation in a family setting and during meal times, so there is a sense of context and balance from a young age. This is not the case in the UK.

Government action is needed to enforce tougher sanctions and penalties to control the sale, availability, advertising and distribution of alcohol. The physical, psychological and social consequences are all too plain to see. Limiting the excesses of this trend in young people and preventing the potential medical disaster of early deaths from ALD will require a co-ordinated and concerted effort from regulatory authorities, the government, families and society in general.

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