ALCOHOL AND ORAL CANCER

A link between alcohol and cancer has been known since 1910, based on a rise in the incidence of aero-digestive tract cancers in Frenchmen who drank absinthe – a distilled, highly alcoholic spirit.

The international Agency on Research for Cancer (IARC) recently reviewed the published evidence for 27 cancer sites and found that of all of the risk sites, the mouth and pharynx had the highest cancer risk among alcohol misusers.

Several epidemiological studies allow us draw the following conclusions:

Alcohol is a strong and independent risk factor for upper aero-digestive tract cancer, particularly mouth and pharynx. As most of the heavy drinkers tend to smoke, the attributable risk of alcohol alone has often been difficult to assess. However, case-control studies that adjusted for confounding by tobacco clearly show a dose-dependent and independent effect of alcohol. This has been further supported by case-control studies on non-smoking subjects.

Smoking, poor oral hygiene and nutritional deficiencies are independent factors associated with upper GI-tract cancer. Alcohol seems to modify these risk factors by synergistic effects.

Increased cancer risk is associated with nearly all types of alcoholic beverages, suggesting that the common ingredient ethanol is causing this effect.

The cancer risk increases steadily with increasing doses and no “saturation” of the cancer risk is observed. A study of mortality rates for oral cancer amongst men from over 20 studies (Fig 1) has indicated that oral cancer deaths are almost doubled by increasing intake of alcohol from two to four units per day.

There is evidence to suggest that the risk of cancer among alcoholics is highest for sites in direct contact with alcohol. The risks seem to be the lowest for the lip and larynx, with the highest for the hypopharynx and floor of mouth.

People from groups such as Seventh-Day Adventists and Mormons, who traditionally abstain from alcohol, have a lower than expected incidence of oral cancer.

A rising incidence in oral cancer has been reported from many European countries (eg Denmark and UK) over the past three decades. Increased per capita consumption of alcohol by European populations since World War II has been implicated in this substantial rise in oral cancer, particularly among young people. Under-age drinking significantly increase the risk of oral cancer.

Synergy with tobacco

A substantial synergy between alcohol and smoking has been demonstrated from many studies or oral cancer. One US study among heavy drinkers showed that the risk appears to rise from 5.8 among non-smokers to 38 among heavy smokers (Fig 2). Together, smoking and drinking can be attributed to approximately 75% of upper aerodigestive tract cancers.
Type of drink

There is some controversy as to what types of alcoholic drinks lead to oral cancer. It’s not clear whether the alcohol concentration or the quantity drunk contributes to estimates of risk and there is no clear evidence that specific alcoholic drinks, such as spirits, wine or beer have different effects on oral tissues. Contradictory evidence from different countries suggests that the most prevalent alcoholic beverage in a given population would be the one causing the highest risk in that population. However, the magnitude of risk seems to be slightly higher for spirits and beer than for wine. Whether this effect is merely due to the alcohol content is unclear as, in addition to alcohol, carcinogenic congeners or additives might also play an etiological role.

Mechanisms and action

While ethanol is not carcinogenic per se the first breakdown product of alcohol - acetaldehyde – is a class 1 carcinogen. Bacteria in the mouth can contribute to the breakdown of alcohol to acetaldehyde, increasing its level. This may suggest that people with poor oral hygiene are more susceptible if they also drink to excess.

Acetaldehyde bound to cell proteins has been detected in biopsies taken from oral mucosa in heavy drinkers diagnosed with mouth cancers, confirming this link (Fig 3). Alcohol may also increase the permeability of other carcinogens such as those as tobacco, which explains the synergy between tobacco and alcohol in causing mouth cancer.

Poor nutrition in alcoholics also contributes to increased cancer risk. Based on how alcohol and acetaldehyde are metabolised in tissues, some people may have increased susceptibility to oral cancer. Genetic aberrations in alcohol metabolising enzymes explains some of the genetic influence on cancer development.

Advice and giving help

Alcohol is second only to smoking as a risk factor for oral and digestive tract cancers but public awareness of the risks of alcohol remains low. As risks are dose-related cutting down on heavy drinking remains one of the main target for oral cancer control. As per EU guidelines for preventing cancers, keeping consumption down to within two drinks per day for men and one drink for women can significantly reduce the risk of oral cancer. Cutting down on binge drinking would also control the rising incidence of oral cancer among young people.

Surveys among dentists indicate lack of involvement in giving brief advice to alcohol misusers to encourage them to reduce their consumption. Brief interventions on alcohol use may help to reduce the incidence of oral cancer and oral potentially malignant disorders.