Cancer Association of South Africa (CANSA)

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Fact Sheet and Position Statement on Alcohol Consumption and Cancer Risk

[Picture Credit: Alcohol]

Introduction

The International Agency for Research on Cancer (IARC) is part of the World Health Organization (WHO). Its major goal is to identify causes of cancer. The most widely used system for classifying carcinogens comes from the IARC.

In the past 30 years, the IARC has evaluated the cancer-causing potential of more than 900 likely substances, placing them into one of the following groups:

- Group 1: Carcinogenic to humans
- Group 2A: Probably carcinogenic to humans
- Group 2B: Possibly carcinogenic to humans
- Group 3: Unclassifiable as to carcinogenicity in humans
- Group 4: Probably not carcinogenic to humans

Alcohol was declared a carcinogen (Group 1) in 1988 by IARC. Surprisingly, most people are not aware of alcohol's cancer risk. The IARC reports that no amount of alcohol is safe to drink. Alcohol is clearly identified as causative for cancers of the mouth, pharynx, larynx, oesophagus, colon, rectum, liver, and female breast. IARC re-confirmed that alcohol is a Group 1 carcinogen in 2007 and again in 2009.

Even 'light drinking' has been linked to causing cancers of the mouth, oesophagus and breast. The more one drinks the greater the cancer risk. There is no risk-free level of alcohol consumption. There is always some risk, and the risk increases in accordance with the level of consumption.

Alcohol is blamed for 1 in every 30 cancer deaths worldwide. It will not be surprising if, in the near future, alcoholic beverages are required to have warning labels explaining risk of cancer, hypertension, stroke, atrial fibrillation and cardiomyopathy.
(IARC Working Group; Bagnardi, *et al*. 2013; American Cancer Society; Cancer Research UK).

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IARC Definitions

The International Agency for Research on Cancer (IARC) uses the following definitions to classify cancer causing substances:

Group 1

The agent is carcinogenic to humans. This category is used when there is sufficient evidence of carcinogenicity in humans. Exceptionally, an agent may be placed in this category when evidence of carcinogenicity in humans is less than sufficient but there is sufficient evidence of carcinogenicity in experimental animals and strong evidence in exposed humans that the agent acts through a relevant mechanism of carcinogenicity.

Group 2

This category includes agents for which, at one extreme, the degree of evidence of carcinogenicity in humans is almost sufficient, as well as those for which, at the other extreme, there are no human data but for which there is evidence of carcinogenicity in experimental animals. Agents are assigned to either Group 2A (probably carcinogenic to humans) or Group 2B (possibly carcinogenic to humans) on the basis of epidemiological and experimental evidence of carcinogenicity and mechanistic and other relevant data. The terms probably carcinogenic and possibly carcinogenic have no quantitative significance and are used simply as descriptors of different levels of evidence of human carcinogenicity, with probably carcinogenic signifying a higher level of evidence than possibly carcinogenic.

Group 2A

The agent is probably carcinogenic to humans. This category is used when there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals. In some cases, an agent may be classified in this category when there is inadequate evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals and strong evidence that the carcinogenesis is mediated by a mechanism that also operates in humans. Exceptionally, an agent may be classified in this category solely on the basis of limited evidence of carcinogenicity in humans. An agent may be assigned to this category if it clearly belongs, based on mechanistic considerations, to a class of agents for which one or more members have been classified in Group 1 or Group 2A.

Group 2B

The agent is possibly carcinogenic to humans. This category is used for agents for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence of carcinogenicity in experimental animals. It may also be used when there is inadequate evidence of carcinogenicity in humans but there is sufficient evidence of carcinogenicity in experimental animals. In some instances, an agent for which there is inadequate evidence of carcinogenicity in humans and less than sufficient evidence of carcinogenicity in experimental animals together with supporting evidence from mechanistic and other relevant data may be placed in this group. An agent may be classified in this category solely on the basis of strong evidence from mechanistic and other relevant data.

Group 3

The agent is not classifiable as to its carcinogenicity to humans. This category is used most commonly for agents for which the evidence of carcinogenicity is inadequate in humans and inadequate or limited in experimental animals. Exceptionally, agents for which the evidence of carcinogenicity is inadequate in humans but sufficient in experimental animals may be placed in this category when there is strong evidence that the mechanism of carcinogenicity

in experimental animals does not operate in humans. Agents that do not fall into any other group are also placed in this category. An evaluation in Group 3 is not a determination of non-carcinogenicity or overall safety. It often means that further research is needed, especially when exposures are widespread or the cancer data are consistent with differing interpretations.

Group 4
The agent is probably not carcinogenic to humans. This category is used for agents for which there is evidence suggesting lack of carcinogenicity in humans and in experimental animals. In some instances, agents for which there is inadequate evidence of carcinogenicity in humans but evidence suggesting lack of carcinogenicity in experimental animals, consistently and strongly supported by a broad range of mechanistic and other relevant data, may be classified in this group.
(IARC Press Release No 196, 2 November 2009).

Carcinogenicity of Alcohol
Alcoholic beverages are carcinogenic to humans (Group 1). Ethanol in alcoholic beverages is carcinogenic to humans (Group 1). The latter evaluation is based on:

(i) the epidemiological evidence, which showed little indication that the carcinogenic effects depend on the type of alcoholic beverage
(ii) the sufficient evidence that ethanol causes cancer in experimental animals; and
(iii) the mechanistic evidence in humans who are deficient in aldehyde dehydrogenase that acetaldehyde derived from the metabolism of ethanol in alcoholic beverages contributes to the causation of malignant oesophageal tumours.

(IARC).

Alcohol use is a cause of cancer. Any level of alcohol consumption increases the risk of developing an alcohol-related cancer; the level of risk increases in line with the level of consumption.

There is strong evidence that alcohol causes cancer at seven sites [in the body], and probably others. The evidence supports "a causal association of alcohol consumption" with cancer in the oropharynx (a part of the throat), the larynx, the oesophagus, the liver, the colon, the rectum and the female breast.

There is also growing evidence suggesting a strong link between alcohol and other cancers, such as prostate, pancreatic and melanoma. However, that evidence is not enough at this point to allow researchers to conclude that there is cause-and-effect relationship for these cancers, according to the article.

Moreover, for each of the seven cancers that are directly linked, previous studies have found that there is a "dose-response relationship," meaning that the more alcohol a person drinks, the more likely the person is to develop those cancers.
(Cancer Research UK; Cancer Council Australia; Living Science).

Alcohol Converted to Acetaldehyde in the Body

In the human, alcohol (ethanol) is converted into a toxic chemical called acetaldehyde. Acetaldehyde was previously classified as possibly carcinogenic to humans (Group 2B) because there was inadequate evidence in humans for the carcinogenicity of acetaldehyde, although there was sufficient evidence in experimental animals for the carcinogenicity of acetaldehyde (IARC Monograph 71, 1999).

However, there is now evidence that acetaldehyde can cause cancer by damaging DNA and stopping the cells from repairing the damage. The International Agency for Research on Cancer has also classified acetaldehyde formed as a result of drinking alcohol as being a cause of cancer, along with alcohol itself.

Nearly 2 billion adults worldwide are estimated to consume alcoholic beverages regularly, with an average daily consumption of 13g of ethanol (about one drink). Alcohol consumption has already been shown to cause cancers of the oral cavity, pharynx, larynx, oesophagus, colorectum, liver and female breast; there is now also some evidence for cancer of the pancreas.

The relative risk of breast cancer increases with increasing alcohol intake by about 10% per 10g/day.

Higher risk for East-Asian populations linked to alcohol metabolism. Alcohol consumption results in exposure to acetaldehyde, present in the beverage itself and also formed when the body breaks down alcohol. Alcohol is metabolised to acetaldehyde, (which is a genotoxic chemical), then this acetaldehyde is further metabolised to acetate (a harmless chemical) by enzymes known as aldehyde dehydrogenases (ALDH).

A large proportion of people of east-Asian origin worldwide (up to 30% in some populations) has an inactive enzyme (known as ALDH2*2) that has only about 10% residual enzymatic activity. Carriers of the inactive enzyme are extremely slow to metabolise acetaldehyde, as a result, they experience higher internal levels of acetaldehyde and have much higher risks of oesophageal cancer and cancers of the head and neck compared with individuals with the active enzyme.

The IARC Working Group concluded that acetaldehyde associated with alcohol consumption is carcinogenic to humans (Group 1) and confirmed the classification in Group 1 of alcohol consumption and of ethanol in alcoholic beverages. (IARC Press Release No 196, 2 November 2009; Wold Cancer Research Fund International).

Alcohol and Oral and Pharyngeal Cancer

According to the IARC Working Group, a large body of evidence from epidemiological studies of different design, and conducted in different populations, consistently shows that consumption of alcoholic beverages is associated with a higher risk for both oral and pharyngeal cancer, and that the risk increases with increasing amounts of alcohol consumed.

Although tobacco use has been proven to increase the risk of oral cancer, people who use both alcohol and tobacco are at an especially high risk of contracting the disease. Scientists now believe that these substances synergistically interact, increasing each other's harmful effects.
(The Oral Cancer Foundation).

Alcohol and Cancer of the Larynx
Studies of different design conducted in Asia, Europe, North America and South America have shown a consistent association between the consumption of alcoholic beverages and the risk for laryngeal cancer. This association increases with increasing amounts of alcoholic beverages consumed and, compared with non-drinkers, regular consumption of about 50g of alcohol per day is associated with an approximately twofold increase in risk. These associations were observed for various types of alcoholic beverages (IARC).

Drinking alcohol, especially spirits, over a long period of time increases a person's risk of getting laryngeal cancer. The risk is much higher for people who are both smokers and heavy drinkers (MacMillan Cancer Support).

Alcohol and Cancer of the Oesophagus
More than 50 prospective and case–control studies from most regions of the world found a consistent association between the risk for oesophageal cancer (squamous cell carcinoma) and the consumption of alcoholic beverages.

The risk increases with increasing amounts of alcoholic beverage consumed and, compared with non-drinkers, regular consumption of about 50g alcohol per day is associated with an approximately twofold increase in risk.

The increased risk for oesophageal cancer was consistently observed for a range of different types of alcoholic beverage. However, the association, if any, is weak for adenocarcinoma of the oesophagus.
(IARC).

A strong association exists between alcohol use and cancers of the oesophagus, pharynx, and mouth, with links to alcohol as a cause of liver, breast, and colorectal cancers.
(National Institute on Alcohol Abuse and Alcoholism).

Oesophageal cancer is associated with a number of risk factors:
- Alcoholic beverages (and acetaldehyde associated with their consumption)
- Betel quid (with and without tobacco)
- Smokeless tobacco
- Tobacco smoking
- X-radiation, gamma-radiation
- Obesity

(Cancer Research UK).

Alcohol and Cancer of the Liver
Studies provide firm evidence that the consumption of alcoholic beverages is an independent risk factor for primary liver cancer. Various types of alcoholic beverage consumed do not have substantially different effects on liver cancer.
(IARC).

Primary liver cancer (hepatocellular carcinoma) tends to occur in livers damaged by birth defects, alcohol abuse, or chronic infection with diseases such as hepatitis B and C, haemochromatosis (a hereditary disease associated with too much iron in the liver), and cirrhosis.

More than half of all people diagnosed with primary liver cancer have cirrhosis - a scarring condition of the liver commonly caused by alcohol abuse. Hepatitis B and C and haemochromatosis can cause permanent damage and liver failure. Liver cancer may also be linked to obesity and fatty liver disease.
(WebMD).

Alcohol and Female Breast Cancer
More than 100 epidemiological studies conducted in all regions of the world have evaluated the association between the consumption of alcoholic beverages and female breast cancer, and have consistently found an increased risk with increasing intake.

The effects of duration or cessation of consumption of alcoholic beverages on the risk for breast cancer are uncertain.
(IARC).

Each increment in one drink per day was associated with 10% increased risk of Androgen Receptor-positive and Oestrogen Receptor-positive breast cancer, respectively.
(Wang, *et al*., 2015).

Research consistently shows that drinking alcoholic beverages - beer, wine, and spirits - increases a woman's risk of hormone-receptor-positive breast cancer. Alcohol can increase levels of oestrogen and other hormones associated with hormone-receptor-positive breast cancer. Alcohol also may increase breast cancer risk by damaging DNA in cells.

Compared to women who do not drink alcohol at all, women who have three alcoholic drinks per week have a 15% higher risk of breast cancer. Experts estimate that the risk of breast cancer goes up another 10% for each additional drink women regularly have each day.

Teen and tween girls aged 9 to 15 who drink three to five drinks a week have three times the risk of developing benign breast lumps. Certain categories of non-cancerous breast lumps are associated with a higher risk of breast cancer later in life.

While only a few studies have been done on drinking alcohol and the risk of recurrence, a 2009 study found that drinking even a few alcoholic beverages per week (three to four drinks) increased the risk of breast cancer coming back in women who had been diagnosed with early-stage disease.

The bottom line is that regularly drinking alcohol can harm one’s health, even if one does not binge drink or get drunk. All types of alcohol count.
(BreastCancer.Org).

Alcohol and Male Breast Cancer
It has been estimated that alcohol drinking increases the risk of breast cancer in women by approximately 7% for each increment of 10g alcohol per day. However, the few studies conducted on breast cancer among men have failed to detect an association with quantitative measures of alcohol drinking, even if the alcohol intake is generally higher in men than in women. On the other hand, increased risks of male breast cancer were inconsistently reported in alcoholics or patients with liver cirrhosis. The researchers investigated the role of alcohol drinking in male breast cancer using data collected in a

population-based case-control study on seven rare cancers, conducted in Denmark, France, Germany, Italy, and Sweden.

The cases were 74 histologically verified male breast cancer patients aged 35-70 years. The controls (n = 1 432) were selected from population registers, and frequency-matched to the cases by age group and geographic area. To check for consistency, a separate analysis was conducted using as controls the patients with a rare cancer other than male breast cancer recruited simultaneously in the European study (n = 519 men).

Based on population controls, the risk of developing breast cancer in men increased by 16% (95% CI: 7-26%) per 10g alcohol/day ($p < 0.001$). An odds ratio of 5.89 (95% CI: 2.21-15.69) was observed for alcohol intake greater than 90g per day, as compared with light consumers (< 15g per day). Similar associations were observed when other rare cancer patients were used as controls.

The researchers found that the relative risk of breast cancer in men is comparable to that in women for alcohol intakes below 60g per day. It continues to increase at high consumption levels not usually studied in women.
(Guénel, *et al*., 2004).

Alcohol and Colorectal Cancer
IARC looked at more than 50 prospective and case–control studies which reported on the association between consumption of alcoholic beverages and the risk for colon, rectal or colorectal cancer. There is no consistent evidence that the association of colorectal cancer with the consumption of alcoholic beverages is modified by gender or by tobacco smoking. The data on the effects of duration and cessation of consumption of alcoholic beverages on the risk for colorectal cancer are inadequate.
(IARC).

Alcohol consumption, amount and type of beverage, and drinking patterns at baseline were considered in examination of the effect of alcohol consumption on the risk of colon cancer. The consumption of one or more alcoholic beverages a day at baseline was associated with approximately a 70% greater risk of colon cancer [relative risk (RR)=1.69; 95% confidence interval (CI)=1.03, 2.79], with a strong positive dose-response relationship (P=0.04). This association appeared to be exclusively related to daily drinking of one or more drinks of liquor (RR=2.48; 95% CI=1.66, 4.53).

Overall, alcohol consumption was significantly associated with increased risk of colon cancer. The most important factor for colon cancer seems to be liquor consumption.
(Su & Arab, 2004).

Alcohol Pink Washing
If you haven't heard of pink washing already, it is a term coined by Breast Cancer Action and has become increasingly popular over the years. A "pink washer" is a company or organisation that says they care about breast cancer by promoting a pink-ribbon product, but that product either has nothing to do with good health or may even contain ingredients linked to the disease. There are many groups of products that are pink washing offenders.
(MS Magazine).

A new study in the October 2014 issue of *Addiction Journal* documents alcohol products promoted with pink ribbons, partnerships with breast cancer charities, and general terms such as 'breast cancer research' or 'cure'. Hundreds of brands promote products with breast cancer awareness ribbons. But pink washing is the term for all the cases when companies that manufacture and market carcinogenic products engage in 'cancer awareness and prevention campaigns'.

Cynically, pink washed alcohol brands contribute to cancer risk in the name of research, treatment, and/or prevention. Pink washed alcohol products extend the potential to increase sales of a carcinogen by linking an iconic charitable cause and entire populations of women, including young women who may already consume alcohol at higher levels. The evidence is clear: moderate and even low alcohol use is a leading risk factor for breast cancer, and 8% of breast cancer cases globally are attributable to alcohol.
(IOGT International).

Some charities in collaboration with alcohol corporations use pink ribbons and other breast cancer-related images, messages and user-generated media to market a product that contributes to cancer disease and death. Cancer charities should adopt policies to separate them from alliances with the alcohol industry.
(Mart & Giesbrecht, 2015).

CANSA's Position on Alcohol Pink Washing

CANSA does not support any form of pink washing to market any product that contributes to cancer disease and death.

CANSA will also not allow its intellectual property (logo) to be used in support of any product that contributes to cancer disease and death.

Alcohol and Cancer Risk

Drinking alcohol increases the risk of mouth and throat cancer (larynx and pharynx), oesophageal cancer, bowel cancer (colon and rectum), liver cancer and female breast cancer. It is not just heavy drinking – even small amounts of alcohol increases cancer risk, but the more one drinks, the greater the risk. One's risk of cancer is the same for all types of alcohol including beer, wine and spirits, and there is no evidence that alcohol helps protect one from any type of cancer.

To reduce the risk of cancer, one should limit one's intake of alcohol or, better still, avoid it all together.
(Cancer Council Victoria).

CANSA's Position:

According to the World Health Organization's International Agency for Research on Cancer (IARC) alcoholic beverages are carcinogenic to humans (Group 1). Acetaldehyde, the breakdown product of alcohol, is also carcinogenic to humans (Group 1).

CANSA supports the evidence that alcohol use is a proven cause of many cancers.

CANSA believes that any level of alcohol consumption increases the risk of developing an alcohol-related cancer.

CANSA further believes that when it comes to cancer, no amount of alcohol consumption is safe. Furthermore, there is sufficient scientific evidence that the level of cancer risk increases in line with the level of alcohol consumption.

CANSA, therefore, advocates against the consumption of alcohol in any form, whether it be beer, wine, or distilled spirits.

Medical Disclaimer

This Fact Sheet is intended to provide general information only and, as such, should not be considered as a substitute for advice, medically or otherwise, covering any specific situation. Users should seek appropriate advice before taking or refraining from taking any action in reliance on any information contained in this Fact Sheet. So far as permissible by law, the Cancer Association of South Africa (CANSA) does not accept any liability to any person (or his/her dependants/estate/heirs) relating to the use of any information contained in this Fact Sheet.

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