

Relationship between Coffee Consumption and Cancer- A Review

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Abstract

Aim : To find out the relationship between coffee consumption and cancer.

Objectives : This review was conducted to assess the role of coffee in cancer.

Background : Coffee is one of the most frequently consumed beverages around the world. More recently, coffee consumption has been associated with a reduction in the risk of several chronic diseases, including type 2 diabetes mellitus, Parkinson's disease and liver disease. Of these associations, the relationship between coffee drinking and cancer risk is of great interest. Compounds in coffee, complex mixture of more than a thousand chemicals, may have either beneficial or unfavourable effects on human body.

Reason : This review was done to establish the proper relationship between coffee consumption and cancer and to find out whether it has harmful or beneficial effects and to create awareness among people.

Keywords: association, cancer, coffee, consumption, risks.

INTRODUCTION :

Coffee is one of the most frequently consumed beverages around the world with a yearly world average consumption of 1.1 kg per capita [1]. Coffee contains a variety of antioxidants, polyphenol, and other biologically active compounds that may help to protect against development or progression of cancer [2,3]. These compounds present in coffee is a complex mixture of more than a thousand chemicals which may have either beneficial or unfavourable effects on human body [4]. Recent studies prove that coffee consumption has been associated with a reduction in the risk of several chronic diseases, including type 2 diabetes mellitus, Parkinson's disease and liver disease [5,6,7]. Coffee consumption may exert an anti-carcinogenic effect in some organs. Coffee consumption may have either a beneficial effect or a harmful effect on cancer. Several meta analyses showed that coffee consumption may decrease risk of certain cancers like prostate cancer, colorectal cancer and liver cancer and even oral cancer [8,9,10]. Some meta analyses showed that increased coffee consumption for a long time may increase or might be a risk factor for gastric cancer [11]. This review is done to associate coffee consumption and cancer and to find out the consistent results of the relationship because even small effects on cancer occurrence due to the high consumption of coffee could have a large impact on public health.

Eligibility criteria:

This review included all the studies and reviews if they met the following criteria: the main interest was coffee consumption including total coffee, decaffeinated coffee or caffeinated coffee and the outcome must be either the risks of cancer by coffee consumption or the beneficial effects on cancer due to cancer consumption, in the study the

researcher must present relative risks (RR's), hazard ratios (HR's) or odd risks (OR's). The exclusion criteria includes all animal studies, commentaries, letter reviews, clinical studies and studies that assessed other associations.

Data extraction:

Data were extracted independently by the author from many studies that is based on the association of coffee and cancer and any discrepancies if any is corrected by the co-author. For each study, the following information was extracted: First author's last name, year of publication, country of origin, category amounts of coffee intake, duration of coffee consumption, outcome assessment, RR's or hazard ratios of cancer and type of cancer that is dealt in the study.

Since it is a review there was no need for any statistical analysis. But the results were obtained with the help of data collected from various studies that is based on the relationship between coffee consumption and cancer. The results that were obtained are discussed below.

Coffee and cancer :

There has been an ongoing debate about the relationship between coffee consumption and cancer since the early 1970s, following a publication stating that coffee was positively associated with cancer [12]. After this publication many researches were done in many parts of the world like America, Europe, Asia etc. The studies were done there to assess the association between coffee consumption and cancer risks. For some types of cancer, coffee intake was inversely associated to the cancer risk [13]. In addition, a Japanese study showed that there was no association between coffee consumption and increased risk of cancer mortality [14].

Coffee and cancer of the oesophagus:

There was only a little evidence for an association between oesophageal cancer risk and amount of coffee consumed. Most studies reported an reduced risk of oesophageal cancer with the consumption of coffee and a recent study found no relationship between coffee consumption and cancer of oesophagus[15].

Coffee and stomach cancer:

No association has been found between coffee consumption and stomach cancer till now.

Coffee and cancer of the upper aero-digestive tract:

All the studies have almost shown that many organs in the upper digestive tract are either inversely associated to cancer risk or have no relation to the cancer risk. There is inverse association between coffee consumption and risk of oral cavity, pharynx, buccal and pharyngeal cancer. There is no relation between coffee consumption and laryngeal cancer[15].

Coffee and liver cancer:

Liver is the fifth most prevalent type of cancer worldwide. Studies looking at the relationship between coffee consumption and risk of liver cancer have found an inverse association and coffee consumption appears to be linked to a slower progression of liver diseases. In a study among a group at a higher risk of developing liver cancer found that moderate coffee drinkers who drank coffee four times a week or more, had a 59% lower risk of developing liver cancer than non-coffee drinkers[16]. There are two mechanisms for coffee's association with a reduced risk of developing liver cancer and slower progression of liver cancer. Coffee could reduce the circulating level of iron and hence reduce the risk of hepatic carcinogenesis and also shown to inhibit the elevation of hepatic transaminases.

Coffee and cancer of pancreas:

Studies were done recently which mentioned that there was no association between coffee consumption and increased risk of pancreatic cancer. Even there was a positive result where coffee drinkers had chances of reducing pancreatic cancer than non coffee drinkers. Some studies which said there was increased risk of pancreatic cancer is not proved. But some studies proved that there was no association between coffee consumption and pancreatic cancer[17,18].

Coffee and bladder cancer:

Tobacco and exposure to aromatic amines are the two major risk factors for the bladder cancer. A study had little evidences at that time that coffee drinking was carcinogenic to human urinary bladder. It classified coffee in group 2B(possibly carcinogenic to humans). Many studies mentioned that there is moderate increase of bladder cancer with coffee consumption and reported upto 18% increased risk in men and 26% in women[19,20,21]. However the relationship between coffee consumption and cancer is inconclusive.

Coffee and kidney cancer:

The incidence of kidney cancer has constantly increased leading to the search for the possible links with diet. The etiology of kidney cancer suggests an increased risk with smoking and overweight. Researches were done to find the link between the coffee consumption and kidney cancer but it clearly and consistently indicated that there is lack of link between coffee drinking and kidney cancer[22,23].

Coffee and prostate cancer:

Some studies have suggested that there is inverse association or no association between coffee consumption and prostate cancer at those times. But in the recent studies it was stated that coffee drinkers had a 21% lower risk of developing prostate cancer than non coffee drinkers[24]. Men who consumed six or more cups of coffee per day had 60% of lower risk of lethal and advanced prostate cancer than non drinkers.

Coffee and colorectal cancer:

There is a modest, favourable effect of moderate coffee consumption on colorectal cancer risk. Many meta analyses were done which showed that there is about 24% of lower risk in those with higher coffee consumption compared to non coffee drinkers[25].

Coffee and breast cancer:

Coffee consumption is not linked to any increase in breast cancer. Certain meta analysis found that coffee drinking is either inversely associated with cancer risk or no relationship between coffee or breast cancer risk[26].

In post menopausal women:

Recent studies have shown no association between coffee consumption and the incidence of breast cancer in post menopausal women but a Swedish study showed a significantly lower risk of non hormone receptive breast cancer in heavy coffee drinkers (more than 5 cups a day) compared to those who drank less than 1 cup a day [27].

In pre menopausal women:

In pre menopausal women at higher risk of breast cancer, there are chances of reducing it by 25-70% with daily consumption of 4-6 cups of coffee drinkers daily than non coffee drinkers. But this reduced risk is only possible with regular coffee not in decaffeinated coffee[28].

Coffee and ovarian cancer:

Ovarian cancer is the fifth most common lethal cancer in women in Europe[29]. Researches did not find any effect of coffee consumption on the development of this ovarian cancer[30].

Coffee and endometrium cancer:

Research suggests that coffee consumption had lower risk of endometrial cancer. Other studies that were done also resulted in the same conclusion. Coffee drinkers were 20% less likely to develop endometrial cancer than non coffee drinkers. American women and Swedish women who drank

two cups of coffee a day had lower risks of developing endometrial cancer than non coffee drinkers[31,32,33].

Coffee and skin cancer:

There is no evidence that coffee consumption is linked to skin cancer. Caffeine, however, may protect skin cells against the harmful effects of UVB radiation. A study was done among humans which showed that caffeine would double the mortality of the cells damaged by UVBs, hence decreasing the risk of cancer[34].

Coffee and lung cancer:

High consumption of coffee may increase the risk of lung cancer. Studies reported that there is positive association between coffee consumption and lung cancer. Those who consumed higher concentration of coffee had 27% higher risk of developing lung cancer and 14% of increased risk in those who drink 2 cups of coffee a day. Decaffeinated coffee drinking is associated with decreased lung cancer risk[35].

Coffee and brain tumours:

Coffee consumption may be linked to a reduced risk of brain tumours, in men in particular. 34% lower risk of glioma was seen in those who consume more than 100ml of coffee a day than those who consume less than 100 ml of coffee a day the study shows the association is slightly stronger in men than in women[36].

CONCLUSION:

Approximately 500 studies were done to find out the relationship of coffee consumption and cancer. Few decades ago doctors were warning that caffeine present in coffee would increase cancer risk. But study after study changed this idea. The recent studies shed a lot of light on the health benefits of coffee and its relationship to cancer. Many studies are continuously done but the results have been changing for every study. Even though the coffee/cancer research isn't definitive, it revealed that drinking coffee is more beneficial than harmful as long as the person metabolize caffeine correctly and doesn't suffer caffeine allergy. But persons who have unhealthy habits like smoking and eating poor quality foods can reduce healthy diet have great anti cancer benefits. It must also be noted that caffeine in coffee is only recommended for moderate level so intake of less than 400 mg of caffeine a day seems to be a safe level for adults.

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