Coffee consumption and the liver – the potential health benefits

A British Liver Trust report, June 2016

BRITISH LIVER TRUST

Pioneering Liver Health

"At last, liver physicians have found a lifestyle habit that is good for your liver!

The evidence in this report shows that drinking coffee can protect you from developing liver disease and in addition reduces the risk of progressive disease for those already affected.

We have an epidemic of liver disease in the UK. The numbers affected are growing at an alarming rate. It is the third biggest cause of premature death in the UK.

The huge increase in liver related mortality is largely a result of our lifestyle - as a nation we are too fat and drink far too much alcohol.

Love Your Liver! Enjoy a cup of coffee but watch the booze and your weight."

Professor Graeme Alexander
President, British Association for the Study of the Liver
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Coffee consumption and the liver – the potential health benefits

This report collates the latest research on the potential benefits and detriments for liver health of drinking coffee.

The British Liver Trust provides this review of the evidence for anyone to make their own conclusions but is of the opinion that drinking moderate amounts of coffee supports better liver health especially in those who have liver disease. The Trust is calling for more clinical research in this area.

This report complements the recently published World Health Organisation (WHO) report (http://www.iarc.fr/en/media-centre/pr/2016/pdfs/pr244_E.pdf) that provides further evidence that drinking coffee regularly may prevent certain types of disease, such as womb and liver cancer and the International Agency for Research on Cancer's (IARC) statement "In its latest review, IARC has judged that there is no negative relationship between coffee consumption and cancer. IARC concluded áthat coffee may actually be protective for some cancers, such as liver and endometrial cancer." http://www.iarc.fr/en/media-centre/iarcnews/pdf/Monographs-Q&A_Vol116.pdf

As with any complementary health care our advice is to always discuss this with your GP or a member of your healthcare team.

As many people at risk of or living with liver disease have other healthcare issues too it is important to take these into consideration and find out what health benefits and detriments there maybe of drinking coffee.

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Executive Summary

Background

Liver disease is one of the most important health issues in the UK. It is currently the UK's

- **3rd main cause of premature death and the rate of death from the disease for those under the age of 65 years has increased by almost 500% since 1970.**
- **only major cause of death still increasing year-on-year.**
- **fifth 'biggest killer' after heart, cancer, stroke and respiratory disease and one in five of us may be affected.**

The liver is the body's largest internal organ and is essential to life. It performs over 500 different functions for the body, including: processing digested food from the intestine; combating infections in the body; manufacturing, breaking down and regulating numerous hormones; and making enzymes and proteins which are responsible for most chemical reactions in the body[1].

The liver's complexity makes it susceptible to many different diseases, including:

Hepatitis: the most common form of liver disease to cause inflammation of the liver. It can occur in both viral (Hepatitis A, B, C, D, and E) and non-viral forms (e.g. alcohol related and autoimmune hepatitis) and can also have autoimmune or genetic causes and may result in an acute or chronic condition;

Cirrhosis: the excessive development of scar tissue within the liver which can lead to complete liver failure. This is the result of long-term, continuous damage to the organ;

Fatty liver disease which includes a range of conditions where there is a build-up of fat in the liver cells. It is caused by certain chemical compounds (particularly alcohol) and by nutritional and endocrine disorders, such as obesity and diabetes;

Liver cancer may occur as both primary (cancer that starts in the liver) and secondary/metastatic (cancer that first develops elsewhere in the body and then spreads to the liver);

Autoimmune conditions such as Autoimmune Hepatitis (AIH), Primary Sclerosing Cholangitis (PSC) and Primary Biliary Cholangitis (PBC)

Genetic diseases such as Haemochromatosis, Wilson's disease and Gilbert's syndrome.

The global scale of the issue

- Liver disease is estimated to affect 6% of the EU's population or approximately 29 million people and is reported to be the EU's 5th biggest killer[1];
- Liver cancer is the 5th most common cause of cancer-related deaths globally and the 14th most prevalent in Europe[2]. It accounts for 5.4%, or 695,000 deaths worldwide (47,000 deaths in Europe)[3];
- Liver cancer is the leading cause of death amongst patients with liver cirrhosis[4];
- It is estimated that over 10 million people in Europe are affected by Hepatitis[1] with 600,000 dying of the acute or chronic consequences of Hepatitis B every year[5]. The WHO (World Health Organization) estimates that there are about 4 million carriers of Hepatitis C in Europe alone[6].

The benefits of coffee consumption

Epidemiological evidence suggests that there is an inverse association between moderate coffee consumption and the risk of developing a range of liver diseases including cancer, fibrosis and cirrhosis.

Studies in patients with a variety of liver diseases have all found moderate coffee drinking has a positive effect on limiting the rate at which disease progresses. In essence:

- Drinking moderate amounts of coffee may help to reduce the risk of liver cancer, and the risk of developing liver cancer falls as coffee consumption rises[7,8,9];
- Moderate coffee consumption may also be related to a slower progression of chronic liver disease. Patients who consumed a higher quantity of coffee have been found to display a milder course of fibrosis, especially in those with alcohol related liver disease[10,11];
- The association between moderate coffee consumption and a slower rate of fibrosis has also been seen in patients with hepatic fibrosis[12], cirrhosis[13], non-alcohol related liver disease[14,15,16,17,18] and Hepatitis C[19,20,21];
- Patients with Hepatitis C who have a higher consumption of coffee, have a lower rate of disease progression than those who drink less coffee[19];
- Caffeine consumption has been related to slower development of cirrhosis in patients scheduled for liver biopsy;
- Several different coffee components besides caffeine are being investigated for their beneficial interaction with the liver. Kahweol and cafestol, naturally-occurring compounds in coffee, have revealed certain anti-carcinogenic properties[22], while chlorogenic and caffeic acids[23] indicate anti-viral characteristics;
- One of the breakdown products of caffeine, paraxanthine, has been shown to slow down the growth of the type of tissue seen in liver fibrosis, alcohol related cirrhosis and liver cancer;
- It is not yet fully clear whether, and to what extent, caffeine may be responsible for the reduction in risk of developing these diseases but it is thought to play a positive role; and
- Research shows coffee consumption is not associated with gastrointestinal dysfunction.

N.B. Many liver diseases cause scar tissue or fibrosis to develop. In the early stages of fibrosis, the liver functions relatively well and few experience symptoms but as the inflammation and liver injury continue, scar tissue builds up. This can eventually disrupt the metabolic functions of the liver and lead to cirrhosis in which the liver is severely scarred, its blood flow restricted and its ability to function, impaired.

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The Evidence

European Coffee Federation - The Institute for Scientific Information on Coffee (ISIC)

http://coffeeandhealth.org/2014/12/coffee-liver-function-overview-research/

http://coffeeandhealth.org/topic-overview/liverfunction/

http://www.ecf-coffee.org/about-coffee/coffee-health

Overview

Three meta-analyses conclude that the available prospective cohort and case-control studies all show an inverse association between moderate coffee consumption and liver cancer, suggesting that an increased consumption of coffee may reduce the risk of liver cancer;

The results of the prospective cohort studies, in particular, are indicative of a dose-response relationship. Two extra cups of coffee per day are associated with a 43% reduced risk of liver cancer, amongst populations who typically consume anything from 1 to over 5 cups a day;

Several studies using patients have been published recently. They should be interpreted with caution, both because of possible flaws in their design and their small sample sizes. One recent noteworthy study in patients with advanced hepatitis C-related liver disease suggests that regular, moderate coffee consumption is associated with lower rates of disease progression;

It is not yet clear whether, and to what extent, caffeine is implicated in the inverse association between coffee consumption and these liver diseases. Several possible mechanisms are under investigation:

- The main primary caffeine metabolite, paraxanthine, appears to suppress the synthesis of CTGF (connective tissue growth factor) via a cascade of control cycles, which subsequently slows down the progression of liver fibrosis, cirrhosis and liver cancer;
- Other alternative mechanisms are related to the anti-carcinogenic effects of cafestol and kahweol, and possible antiviral effects of chlorogenic acids and caffeic acid.

Background information

The prevalence of liver diseases is estimated to be approximately 6% in the EU[1]. In other words, some 29 million people suffer from liver diseases. Liver disease causes the death of 70,000 people annually in Europe, and it is the fifth most common cause of death, responsible for just over 14% of all deaths.

Data suggests that about 0.1% of the European population is affected by cirrhosis, corresponding to an estimated 170,000 deaths per year. There are large intra-European variations, for example about 0.1% of Hungarian males will die of cirrhosis every year compared with 0.001% of Greek females[2].

Hepatitis, the most common liver disease, is estimated to affect over 10 million people in Europe[2].

Liver cancer is the 5th most common cause of cancer-related deaths globally, and the 14th most prevalent in Europe[3]. It accounts for 5.4 %, or 695,000 deaths worldwide (47000 deaths in Europe)[4]. Liver cancer is the leading cause of death amongst patients with liver cirrhosis[5].

Epidemiological projections suggest an increase in the number of people at risk of chronic liver disease[6].

In 1992, the first study on the Kaiser Permanente Medical Care Program cohort in California reported that coffee drinking might protect against liver cirrhosis[7]. In this study, 59 cases of liver cirrhosis were diagnosed and subjects who drank four or more cups of coffee per day had 80% less chance of developing liver cirrhosis than non-coffee drinkers. In 1993, in a second study by the same group, it was reported that coffee drinkers had 23% less chance of dying from liver cirrhosis than non-coffee drinkers[8].

The results of these two prospective cohort studies started a series of studies and publications about associations between coffee consumption and diseases of the liver.

Coffee consumption and liver function

Coffee and risk of liver cancer

Three meta-analyses of both prospective cohort and case control studies[9,10,11] looking at liver cancer, concluded that all ten reviewed epidemiological studies show an inverse association between coffee consumption and liver cancer. The findings suggest that an increased consumption of coffee may reduce the risk of liver cancer.

This inverse association between coffee consumption and liver cancer exists both in participants with and without a history of liver disease. Overall, an increase in consumption of 2 cups of coffee per day is associated with a 43% reduced risk of liver cancer amongst populations who typically consume anything from 1 to over 5 cups per day.

The two striking features of the results of the epidemiological studies[9,10,11] are their consistency and the very large reductions in observed disease risk.

The results of the cohort studies included in the meta-analyses indicate a dose-response relationship between frequency of coffee consumption and the reduced risk for liver cancer. For the case-control studies, the same holds to a lesser extent. However, it should also be noted that most of the included studies originate from one country (Japan).

In 2011, a further case-control study conducted in a Chinese population of hepatitis C chronic carriers found that moderate coffee consumption reduced the risk of hepatocellular carcinoma by almost half with a significant dose-response effect, reducing the risk for moderate coffee drinkers by 59%[12].

A case-control study with a group of hepatocellular carcinoma (HCC) patients suggested that a lifetime coffee consumption greater than 20000 cups (or an average of 3 per day) was negatively associated with development of this cancer. This association did not affect the risk of HCC in hepatitis B patients[13].

Research in a group of Finnish male smokers suggested that coffee intake was inversely associated with incident liver cancer and mortality from chronic liver disease, irrespective of whether the coffee was boiled or filtered[14].

Data from the US Multi Ethnic Cohort suggests that coffee consumption is inversely related to the incidence of hepatocellular cancer, showing a risk reduction of 38% in those who drank 2-3 cups of coffee per day and 41% in those who drank more than 4 cups[15].

Coffee and risk of other liver diseases

Coffee drinking has also been related to a reduced risk of other liver diseases, thus suggesting a continuum of favourable effects of coffee on liver function. A systematic review published in 2014 suggested coffee consumption was associated with beneficial outcomes in patients with chronic liver disease, cirrhosis, hepatocellular cancer and non-alcohol related fatty liver disease[16].

A 2009 review article[17] concluded that patients with higher coffee consumption display a milder course of fibrosis, especially in alcohol related liver disease;

A small cross-sectional North American study recruited 177 patients scheduled for liver biopsy over a period of 6 months[18]. They observed that caffeine consumption was associated with less severe hepatic fibrosis;

Data from the US National Health and Nutrition Examination Surveys (NHANES 1999-2010) suggests that higher intakes of coffee (including decaffeinated coffee) were associated with beneficially lower levels of liver enzymes[19].

Chronic Liver Disease

An Italian cross-sectional study recruited 749 patients with chronic liver disease and looked for any association between alcohol and coffee consumption and the development of cirrhosis[20]. The results suggest a favourable effect of coffee, but because of the small numbers in some of their sub-groups, these results are not conclusive;

A Scottish study suggested that coffee drinking is associated with a reduced prevalence of cirrhosis in patients with chronic liver disease[21];

Data from the US Multi Ethnic Cohort concluded that coffee drinking is associated with a reduced incidence of chronic liver disease. Compared to non-coffee drinkers consuming 2-3 cups per day was associated with a 46% reduction in risk of death from chronic liver disease and greater than 4 cups a day with a 71% reduction[12].

Non-alcohol related fatty liver disease

Another Italian study recruited 137 patients with non-alcohol related fatty liver disease and compared this group with a group of 108 other patients[22]. The results indicate a possible favourable association with coffee consumption. However, because of the design used in this study (patients with one disease versus patients with other diseases), the findings should also be interpreted with caution.

A further North American study to investigate the effects of dietary behaviour in non-alcohol related fatty liver disease patients, using four continuous cycles of the National Health and Nutrition Examination Surveys (NHANES 2001-2008) found caffeine intake to be independently associated with a lower risk of non-alcohol related fatty liver disease suggesting a potential protective effect[23].

A 2011 study correlated coffee caffeine consumption with the prevalence and severity of non-alcohol related fatty liver disease. Coffee caffeine consumption was associated with a significant reduction in risk of fibrosis among patients with non-alcohol related steatohepatitis[24].

A Mexican case-control study looked at the antioxidant effect of coffee by measuring antioxidant enzymes and lipid peroxidation markers in patients with non-alcohol related fatty liver disease and in patients without non-alcohol related fatty liver disease. They found a high intake of coffee to have a protective effect against non-alcohol related fatty liver disease, however there was no significant difference in the antioxidant variables analyzed[25].

Data from 728 adults in the Non-alcohol related Steatohepatitis Clinical Research Network (NASH-CRN) suggests that coffee intake was inversely associated with advanced fibrosis in patients with non-alcohol related fatty liver disease[26].

Hepatitis C

A prospective cohort US study recruited 766 hepatitis C-infected patients and followed them up for nearly four years[27]. A total of 230 patients showed serious disease progression, e. g. cirrhosis or 2-point increase in Ishak fibrosis score (a histological grading of progression to fibrosis, with scores ranging from 0 to 6). Tea consumption was not associated with the study outcomes. However, regular coffee consumption was statistically significantly associated with lower rates of disease progression.

A French study developed to evaluate the impact of caffeine consumption on activity grade and fibrosis stage in patients with chronic hepatitis C found that caffeine consumption greater than 408 mg/day was associated with reduced histological activity in these patients[28].

A study of patients with Hepatitis C virus suggested that amongst those with a chronic infection, daily consumption of filtered coffee may have a beneficial effect on the stabilisation of the liver enzyme serum alanine aminotransferase (ALT)[29].

Data from the Singapore Chinese Health Study, a population based cohort of 63275 adults suggested that there was a strong dose-dependent inverse association between coffee intake and risk of non-viral hepatitis related cirrhosis. Compared to non-coffee drinkers, those who drank more than 2 cups a day had a 66% reduction in mortality risk. However, there was no association between coffee intake and hepatitis B related cirrhosis[30].

* If patients change their habits or diet as a result of their disease or its standard therapy, this can bias the observational study. Therefore it is important to assess whether such confounders are adequately taken into account. Case control-studies are particularly susceptible to bias, in particular when other patients are used as controls; prospective cohort studies are less susceptible to this type of bias.

Potential mechanisms

There is some epidemiological evidence for a real and inverse association between coffee consumption and liver cancer. The same probably holds for liver fibrosis and alcohol related cirrhosis. Clearly, a plausible biological mechanism is required to explain and confirm these associations.

The role of caffeine

Two reviews[17,31] as well as a 2009 paper[32], show that caffeine, and in particular its main primary metabolite paraxanthine, can suppress the synthesis of CTGF (connective tissue growth factor) via a cascade of control cycles, thereby slowing down the growth of this type of tissue which in turn slows down the progression of liver fibrosis, alcohol related cirrhosis and liver cancer.

However, some of the epidemiological studies did not find an association with tea, which suggests that the mechanism of action might be not dependent solely on caffeine (via paraxanthine).

Other coffee constituents

A 2010 paper[33] also mentions the potential role of the coffee components kahweol and cafestol in lowering the risk of liver cancer. There is some evidence that they have anti-carcinogenic properties.

A further paper looks at the role of the chlorogenic acids and caffeic acid in coffee, which have been shown to be capable of preventing hepatitis B virus replication, both in vitro and in vivo[34].

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Questions patients ask

Q. Is coffee good for the liver?

A. Research suggests that regular, moderate coffee consumption can lower people's risk of developing a range of liver diseases – including cancer, fibrosis (scar tissue that builds up within the liver) and cirrhosis (the result of a long-term build up of scar tissue within the liver).

Q. How many cups of coffee do I need to drink to see a benefit?

A. It is too early to make specific recommendations concerning the levels of coffee intake that may be beneficial for liver function. Research suggests that regular, moderate coffee consumption may be beneficial[1,2,3]. However certain patients with specific conditions may need to limit their caffeine consumption. For example, pregnant women are advised to limit their caffeine intake to 200-300mg per day – the equivalent amount found in 2-3 regular cups of coffee.

Q. Are the benefits of coffee down to caffeine?

A. While research has suggested that caffeine may slow down the progression of liver fibrosis, alcohol related cirrhosis and liver cancer[1,2,3,4,5,6] the extent to which caffeine is implicated in the reduced risk of developing these diseases remains unclear. Research also suggests that other coffee constituents, including cafestol and kahweol[7] (naturally occurring compounds found in the oily part of coffee), and antioxidants may have a beneficial effect on liver function.

Q. Is decaffeinated coffee as good as regular coffee?

A. Research suggests that caffeine might play a role in the relationship between coffee drinking and lower risk of liver disease; however, currently there are no published studies specifically investigating the effects of decaffeinated coffee on liver function.

Q. If I'm a coffee drinker, can I drink more alcohol without increasing my risk of liver disease?

A. No. All medical advice makes clear that excessive alcohol consumption is detrimental to health. Adults who choose to consume alcohol should be aware of the recommended advice for safe consumption. While scientific research suggests that coffee drinking may have a beneficial effect on liver function, the risks associated with excessive alcohol consumption are not counter balanced by coffee consumption.

Q. I've heard that the effects of alcohol on the liver can be different for women than for men. Is the same true for coffee?

A. Generally, the effect of coffee drinking does not differ between the sexes; however, some groups, such as pregnant women, smokers, or women taking hormone replacement therapy do metabolise caffeine at a different rate to those in the general population. Pregnant women are advised to limit their caffeine intake to 200-300mg per day – the equivalent amount found in 2-3 regular cups of coffee.

Q. Do all types of coffee have the same effect?

A. Studies investigating the relationship between coffee and liver function have demonstrated beneficial effects in various types of coffee preparation, including filtered, instant and espresso coffee.

Q. Is it safe for individuals with liver disease to drink coffee?

A. Yes, there is no evidence to suggest that moderate coffee drinking poses any dangers for individuals with liver disease. In fact, some studies suggest coffee may slow down the progression of liver disease in some patients.

Q. Does coffee have any benefits for individuals with liver disease?

A. Research has shown that individuals with liver disease who regularly drink moderate amounts of coffee tend to display a milder progression of the disease[8].

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Coffee and Health: Fact or Fiction

http://coffeeandhealth.org/wp-content/uploads/2015/01/ISICS-Fact-or-Fiction-V3.pdf

Coffee is one of the most widely researched food items in the world. Overall, the large and growing body of scientific research shows that coffee, when drunk in moderation i.e. 3-5 cups regular cups per day, is perfectly safe for the majority of adults.

However there are still many misconceptions about coffee and health which can lead to confusion about whether coffee consumption can be enjoyed as part of a healthy, balanced diet. You may come across these in your daily practice.

Drinking coffee is bad for health

Fiction

- Regular coffee drinking can be part of a healthy, balanced diet and lifestyle and moderate coffee consumption i.e. 3-5 regular cups day is safe for most individuals with no adverse effects;
- Scientific evidence also suggests that moderate coffee consumption may actually offer a number of benefits. For example the European Food Safety Authority recently stated that caffeine improves both sports performance (endurance exercise) and increases attention and alertness[1,2];
- However some individuals may choose to switch to decaffeinated coffee e.g. pregnant women, those sensitive to the stimulant effects of caffeine late afternoon/evening. For these individuals, decaffeinated coffee provides an alternative so they can still enjoy the taste and aroma of coffee.

Drinking coffee does not increase with the risk of cardiovascular disease

Fact

- Moderate coffee consumption is not linked to an increased risk of cardiovascular problems such as heart disease, heart attacks, irregular heart beat or high blood pressure[3,4];
- Research also suggests that, in both men and women, drinking coffee in moderation may reduce their risk of stroke, but no firm conclusion has yet been drawn[5];
- Coffee's effects on cholesterol levels are largely dependent on the method of brewing. Filtered coffee is not associated with a significant increase in cholesterol levels, while boiled coffee can raise cholesterol levels[6].

Pregnant women should stop drinking coffee

Fiction

- Studies from the last decade clearly report that moderate caffeine consumption including that from coffee, is not a matter of concern for a healthy pregnancy[7]. Pregnant women can still enjoy a couple of cups of regular coffee a day;
- The European Food Safety Authority (EFSA) in its Scientific Opinion on Caffeine recommends that pregnant women should limit their daily caffeine intake to 200mg from all sources (EFSA 2015). A regular cup of caffeinated coffee contains approximately 80-85mg of caffeine;
- Overall, well conducted scientific studies in humans have shown no adverse effects on the fetus if a pregnant woman consumes a moderate amount of caffeine from coffee or other caffeinated beverages.

Drinking coffee helps improve sports performance

Fact

- The effects of coffee consumption on sports performance are linked to the caffeine in coffee, rather than to the coffee itself
- The European Food Safety Authority (EFSA) recently stated that a cause and effect relationship has been established for caffeine intake and increased endurance performance, endurance capacity, and a reduction in perceived exertion 1. Caffeine is effective at doses of 3-4mg/kg
- Caffeine may moderate central fatigue and influence ratings of perceived exertion, pain and levels of vigour, all of which are likely to lead to improvements in performance[9]

Drinking coffee keeps me alert and helps me concentrate

Fact

- The caffeine in coffee is well known for its stimulating effects which have scientifically proven benefits on mental performance
- The European Food Safety Authority (EFSA) recently stated that a 75mg serving of caffeine (the amount found in approximately one regular cup of coffee) increases both attention and alertness[2]
- The stimulant effects of a regular cup of coffee are observed between 15-45 minutes after consumption and normally last for about four hours[10]

Coffee can become addictive

Fiction

- While caffeine in coffee is a mild central nervous system stimulant, recent scientific studies using brain scans suggest that moderate coffee drinkers do not develop a physical dependence to caffeine[13,14,15]
- Some studies suggest that removing caffeine from the diet suddenly may lead to mild, temporary withdrawal symptoms like headache in some individuals. These symptoms can be avoided by a gradual reduction of caffeine intake from the diet over time[16]
- It is likely that people continue to drink coffee because they enjoy its taste and aroma and recognise it as a behavioural stimulant and not because of any addictive qualities of caffeine

Coffee is dehydrating

Fiction

- While there is some indication of a mild, short-term diuretic effect of caffeine, this effect is not strong enough to counterbalance the benefits of fluid intake from coffee drinking
- Scientific evidence looking at the effects of caffeine on fluid balance does not support a significant diuretic effect of caffeine[11]
- Coffee drinking in moderation contributes to our daily fluid intake and does not lead to dehydration or significant loss of body fluid[12]

Drinking coffee in the afternoon or evening does not always disrupt sleep

Fact

- Some people who are sensitive to caffeine find that the mild stimulation of coffee consumed late in the afternoon or shortly before going to bed, may delay the time it takes them to fall asleep and/or affects their sleep overall. Other people consume caffeinated drinks during the evening and have no problems falling asleep
- Anyone who is sensitive to the stimulant effects of caffeine can enjoy a decaffeinated coffee during the afternoon and evening instead[17]
- It should be noted that there are many other factors including noise, temperature and discomfort, that may affect how long it takes someone to get to sleep[18]

Decaffeinated coffee is healthier than regular coffee

Fiction

- There are some circumstances when individuals may be advised to or choose to switch to decaffeinated coffee. Pregnant women for example, are advised to limit their caffeine intake to 200mg per day 8 and also those very sensitive to caffeine. For those individuals, decaffeinated coffee provides an alternative so they can still enjoy the taste and aroma of coffee
- In addition, some people find that the mild stimulant effect of caffeine consumed late in the afternoon or shortly before going to bed affects their sleep. In their case, it is well advised to switch to decaffeinated coffee during the afternoon and evening 17. EFSA in its Scientific Opinion on Caffeine concluded that single doses of 100mg of caffeine may increase sleep latency and reduce sleep duration on some adults, particularly when consumed close to bedtime[8]
- In other cases, drinking caffeinated coffee has actually been shown to have some health benefits. For example, the European Food Safety Authority recently stated that caffeine improves both sports performance (endurance exercise) and increases attention and alertness.[1,2]

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The British Coffee Association

http://www.britishcoffeeassociation.org/coffee_and_health/

http://www.britishcoffeeassociation.org/coffee_and_health/coffee_and_health/liver_health/

Liver health

Research suggests that moderate coffee consumption may have a positive effect on limiting disease progression in those with liver cirrhosis, chronic liver disease, fatty liver disease, Hepatitis B, Hepatitis C and hepatocellular carcinoma (HCC), the most common type of liver cancer. Liver disease is estimated to affect 6% of the EU's population (approx. 29 million people).[1]

Non-alcohol related fatty liver disease (NAFLD)

A study accepted in 2013 showed that caffeine intake may protect against fatty liver disease.[2] Whilst the effect of coffee consumption on the body's metabolism and fat oxidation have been well documented in both humans and animals[3,4,5] these new data help explain the direct action of coffee on the liver.

Fatty liver disease is a term for a wide range of conditions caused by the build-up of fat within the liver cells. Fatty liver disease is very common in the UK with an estimated one in five people having early forms of the disease.[6]

Liver cirrhosis

Coffee consumption is related to slower development of cirrhosis in patients with chronic liver disease. In April 2014, the American Association for the Study of Liver Diseases (AASLD) found consuming two or more cups of coffee per day reduces the risk of death from liver cirrhosis, caused by non-viral hepatitis, by 66%.[7] The study was one of the first to demonstrate a difference between the effects of coffee on non-viral and viral hepatitis related cirrhosis mortality.[7]

Hepatocellular carcinoma (HCC) and chronic liver disease (CLD)

The American Association for Cancer Research (AACR) found consuming four or more cups of coffee per day reduces the risk of developing HCC by 42%.[8] The study, presented at the AACR Annual Meeting 2014, addressed the lack of data from prospective studies in the US population by evaluating the association between coffee intake and HCC incidence in a multi-ethnic US population.[8]

A new study, published online in October, 2014, found that increased coffee consumption reduces the risk of HCC and CLD in multi-ethnic US populations.9 Compared to individuals who did not drink coffee, those who drank ≥4 cups per day had a 41% reduction in risk of HCC and a 71% reduction in risk of CLD death.[9]

Summary

Coffee consumption seems to exert a beneficial effect on patients with liver diseases or at risk of developing liver diseases.[10]

Dr Sarah Jarvis, GP, comments: *"The results of these studies provide additional evidence that coffee consumption may reduce the risk of developing liver diseases such as cirrhosis and HCC. Though the AASLD study was conducted in a specific demographic of Chinese subjects aged 45 to 74, these results will resonate with the 10-20% of people at risk of developing chronic liver disease in the UK.[11] It's interesting to note that the study found ingredients of coffee other than caffeine appear to be responsible for the risk reduction."*

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Gastrointestinal Function

Research compiled by the Institute for Scientific Information on Coffee (ISIC) on the impact of drinking coffee on the various functions of the digestive tract suggests that coffee consumption has no significant adverse effects on the functioning of the GI tract in healthy individuals.

There is no evidence to suggest that coffee consumption causes acid reflux. In fact, it is suggested that common causes of acid reflux are the consumption of spicy or fatty food and overeating.[1,2,3,4] One study found that 38% of people thought coffee was a cause of dyspepsia,[5] however no association between drinking coffee and this condition have been found.[6,7,8,9] Recent research suggests coffee does not lead to dehydration and contributes to daily fluid intake.[10]

Dr Sarah Schenker, Registered Dietitian, says: *"According to the NHS, around 2 in 5 people have at least one digestive symptom at any one time, with the most common being constipation, indigestion and heartburn.[11] Extensive research shows there is no indication that coffee influences disorders such as IBS, gastritis, Crohn's Disease, colitis and ulcers, meaning those who suffer from these disorders can enjoy their coffee if they wish."*

Coffee is one of the most heavily researched products in the world today and the overwhelming weight of scientific information suggests that moderate coffee consumption of four to five cups per day (400mg of caffeine) can contribute to a healthy, balanced diet and may confer some health benefits.[12,13,14]

For pregnant women the NHS recommends consuming no more than 200mg of caffeine per day from all sources (an average mug of instant coffee contains approximately 100mg of caffeine).[15]

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Irish Coffee Council

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http://www.coffeecouncil.ie/Sectors/CoffeeCouncil/ICC.nsf/vPages/Coffee_and_Health~liver-function?OpenDocument

Liver Function

Summary

- Epidemiological evidence suggests that moderate coffee consumption may help to reduce the risk of liver cancer, and the risk falls as coffee consumption rises.
- Epidemiological studies in patients with various liver diseases have all found a positive effect of moderate coffee drinking on limiting disease progression.
- Patients with alcohol related liver disease who have a higher coffee consumption have a slower rate of fibrosis* than those who drink less coffee.
- Caffeine consumption is related to less severe fibrosis in patients scheduled for liver biopsy.
- Coffee consumption is related to slower development of cirrhosis in patients with chronic liver disease. Patients with Hepatitis C-related liver disease, who have a higher consumption of coffee, have a lower rate of disease progression than those drinking less coffee. However, patient studies should be interpreted with caution as there are many confounders which can bias results, e.g. small subject numbers and patients changing their habits or diet as a result of their disease.
- Several mechanisms underlying the association between moderate coffee consumption and reduced risk of liver cancer and disease progression are under investigation.
- One of the breakdown products of caffeine, paraxanthine, has been shown to slow down the growth of the type of tissue seen in liver fibrosis, alcohol related cirrhosis and liver cancer. Other alternative mechanisms are related to the anti-carcinogenic effects of cafestol and kahweol, and possible anti-viral effects of chlorogenic acids and caffeic acid.

*Many liver diseases cause scar tissue, known as fibrosis, to develop. In the early stages of fibrosis, the liver functions relatively well and few people experience symptoms. But as the inflammation and liver injury continue, scar tissue builds up. This can eventually disrupt the metabolic functions of the liver and lead to cirrhosis in which the liver is severely scarred, its blood flow restricted and its ability to function severely impaired.

Scientific Research

Regular coffee consumption may decrease the risk of liver cancer

An increased consumption of coffee may help to reduce the risk of liver cancer. Two reviews of a total of ten studies have found that as coffee consumption increases, risk of liver cancer decreases[5,6]. This association is seen in healthy individuals as well as those with previous liver disease. The two striking features of the results of these studies are their consistency and the very large reduction in observed disease risk. Overall, an increase in coffee consumption of 2 cups per day, in individuals who typically consume anything from 1 to over 5 cups a day, is associated with a 43% lower risk of developing liver cancer[6].

Coffee may decrease the rate at which fibrosis progresses

Coffee drinking has also been related to a reduced risk of other liver diseases, thus suggesting a continuum of favourable effects of coffee on liver function. A recent review[7] concluded that patients with higher coffee consumption displayed a slower progression of fibrosis, especially those with alcohol related liver disease. Any slowing down in fibrosis development prolongs the function of the liver, delaying the progression to cirrhosis and irreparable liver damage.

Eight recent patient studies[8,9,10,11,12,13,14,15] all found that those patients who drank more coffee tended to have less severe fibrosis or a slower progression of fibrosis than those who drank less coffee. This effect was seen in patients with hepatic fibrosis[8], cirrhosis[9], non-alcohol related fatty liver disease[10,11,12,13] and Hepatitis-C related liver disease[14,15].

Although studies of liver disease in patients have had promising results, there are limitations to patient studies which must be considered. Small subject numbers and ongoing patient therapy can interfere with trials. If patients change their habits or diet as a result of their disease or its standard therapy, this can bias results.

There is evidence of quite a large positive effect of coffee consumption on liver cancer. Studies to date also suggest beneficial effects on liver fibrosis and alcohol related cirrhosis. Several potential mechanisms, which may be responsible for these effects, are currently under investigation.

Why?

There is some evidence for a potential role for caffeine on liver cancer. Two reviews[7,16] and another 2009 study[17] show that caffeine and, in particular, its main metabolite paraxanthine, can suppress the synthesis of CTGF (connective tissue growth factor) which may slow down the progression of liver fibrosis, alcohol related cirrhosis and liver cancer.

However, some of the epidemiological studies do not find an association with tea, which suggests that the mechanism of action might not be dependent solely on caffeine.

Other compounds present in coffee are also being studied. Two naturally occurring coffee compounds, kahweol and cafestol (both oil components in coffee) are believed to have anti-carcinogenic properties which could be responsible for a reduction in the risk of liver cancer[18]. Chlorogenic and caffeic acids, two plant phenols present in coffee, have been found to have anti-viral properties and to be capable of preventing replication of the Hepatitis B virus[19]. This could also have a potential role in coffee's effects on the liver.

Conclusion

The scientific evidence suggests that moderate coffee consumption is related to a lower risk of liver cancer and slowing of disease progression in liver fibrosis and alcohol related cirrhosis. There is also evidence that moderate coffee drinking could be beneficial in slowing the progression of viral infections of the liver. Several mechanisms underlying these effects are currently under investigation.

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Scientific and Medical Research

Systematic review with meta-analysis: coffee consumption and the risk of cirrhosis

O J Kennedy et al, 2016

Alimentary Pharmacology and Therapeutics

http://www.ncbi.nlm.nih.gov/pubmed/26806124

ABSTRACT

BACKGROUND

Liver cirrhosis is a large burden on global health, causing over one million deaths per year. Observational studies have reported an inverse association between coffee and cirrhosis.

AIMS

To perform a systematic review and meta-analysis to characterise the relationship between coffee consumption and cirrhosis.

METHODS

We searched for studies published until July 2015 that reported odds ratios, relative risks (RR) or hazard ratios for cirrhosis stratified by coffee consumption. We calculated RRs of cirrhosis for an increase in daily coffee consumption of two cups for each study and overall. We performed analyses by study design, type of cirrhosis and mortality. We assessed the risk of bias in each study and the overall quality of evidence for the effect of coffee on cirrhosis.

RESULTS

We identified five cohort studies and four case-control studies involving 1990 cases and 432 133 participants. We observed a dose-response in most studies and overall. The pooled RR of cirrhosis for a daily increase in coffee consumption of two cups was 0.56 (95% CI 0.44-0.68; I^2 83.3%). The RR pooled from cohort studies for a daily increase of two cups was 0.58 (95% CI 0.41-0.76; I^2 91.1%) and from case-control studies it was 0.52 (95% CI 0.40-0.63; I^2 0.0%). The pooled RR of alcohol related cirrhosis for a daily increase of two cups was 0.62 (95% CI 0.51-0.73; I^2 0%) and of death from cirrhosis it was 0.55 (95% CI 0.35-0.74; I^2 90.3%).

CONCLUSION

This meta-analysis suggests that increasing coffee consumption may substantially reduce the risk of cirrhosis.

Association between caffeine consumption and non-alcohol related fatty liver disease: a systematic review and meta-analysis.

H Shen et al, 2016

Therapeutic Advances in Gastroenterology, Volume 9 (1)

http://www.ncbi.nlm.nih.gov/pubmed/26770272

ABSTRACT

OBJECTIVES

Caffeine consumption is reported to be associated with reduced hepatic fibrosis in patients with chronic liver diseases. We performed a systematic review and meta-analysis to assess the association between caffeine consumption and prevalence or hepatic fibrosis of non-alcohol related fatty liver disease (NAFLD) in observational studies.

METHODS

We searched the literature of all languages from PubMed, EMBASE, and the Cochrane library from 1 January 1980 through 10 January 2015. Total caffeine consumption was defined as the daily intake of caffeine (mg/day) from all caffeine-containing products. Combined and subgroup analyses stratified by study designs, study locations, and type of caffeine intake were performed.

Results: Four cross-sectional and two case control studies with a total of 20,064 subjects were included in the meta-analysis. Among these, three studies with 18,990 subjects were included in the analysis for prevalence of NAFLD while the other three studies with 1074 subjects were for hepatic fibrosis. Total caffeine consumption (mg/day) was not significantly associated with either the prevalence [pooled mean difference (MD) 2.36; 95% confidence interval (CI) −35.92 to 40.64] or hepatic fibrosis (higher versus lower stages; pooled MD −39.95; 95% CI −132.72 to 52.82) of NAFLD. Subgroup analyses stratified by study designs and locations were also not significant. However, after stratifying by type of caffeine intake, regular coffee caffeine intake (mg/day) was significantly associated with reduced hepatic fibrosis of NAFLD (pooled MD −91.35; 95% CI −139.42 to −43.27; n = 2 studies).

CONCLUSION

Although total caffeine intake is not associated with the prevalence or hepatic fibrosis of NAFLD, regular coffee caffeine consumption may significantly reduce hepatic fibrosis in patients with NAFLD.

Coffee Consumption Decreases Risks for Hepatic Fibrosis and Cirrhosis: A Meta-Analysis

F Liu et al, 2015

PLOS One

http://www.ncbi.nlm.nih.gov/pubmed/26556483

ABSTRACT

BACKGROUND AND AIM

Previous studies have demonstrated that coffee consumption may be inversely correlated with hepatic fibrosis and cirrhosis. However, the reported results have been inconsistent. To summarize previous evidences quantitatively, a meta-analysis was performed.

METHODS

The Medline, Web of Science, and Embase databases (from inception to June 2015) were searched to identify relevant trials that evaluated the effects of coffee consumption on hepatic fibrosis or cirrhosis. Odds ratios (ORs) of advanced hepatic fibrosis or cirrhosis for low or moderate, high, and any coffee consumption versus no consumption were pooled. Two cups per day was used as the cut-off level between low or moderate and high consumption.

RESULTS

Sixteen studies were included, involving 3034 coffee consumers and 132076 people who do not consume coffee. The pooled results of the meta-analysis indicated that coffee consumers were less likely to develop cirrhosis compared with those who do not consume coffee, with a summary OR of 0.61 (95%CI: 0.45-0.84). For low or moderate coffee consumption versus no consumption, the pooled OR of hepatic cirrhosis was 0.66 (95%CI: 0.47-0.92). High coffee consumption could also significantly reduce the risk for hepatic cirrhosis when compared with no coffee consumption (OR = 0.53, 95%CI: 0.42-0.68). The effect of coffee consumption on hepatic fibrosis was summarized as well. The pooled OR of advanced hepatic fibrosis for coffee consumption versus no consumption was 0.73 (95%CI: 0.58-0.92). The protective effect of coffee on hepatic fibrosis and cirrhosis was also identified in subgroup meta-analyses of patients with alcohol related liver disease and chronic hepatitis C virus (HCV) infection.

CONCLUSION

Coffee consumption can significantly reduce the risk for hepatic fibrosis and cirrhosis.

Oily fish, Coffee and Walnuts: Dietary Treatment for non-alcohol related fatty liver disease

V Gupta et al, 2015

World Journal of Gastroenterology, Volume 21 (37)

http://www.ncbi.nlm.nih.gov/pubmed/26457022

ABSTRACT

Rates of non-alcohol related fatty liver disease (NAFLD) are increasing worldwide in tandem with the metabolic syndrome, with the progressive form of disease, non-alcohol related steatohepatitis (NASH) likely to become the most common cause of end stage liver disease in the not too distant future. Lifestyle modification and weight loss remain the main focus of management in NAFLD and NASH; however, there has been growing interest in the benefit of specific foods and dietary components on disease progression, with some foods showing protective properties. This article provides an overview of the foods that show the most promise and their potential benefits in NAFLD/NASH, specifically; oily fish/ fish oil, coffee, nuts, tea, red wine, avocado and olive oil.

Furthermore, it summarises results from animal and human trials and highlights potential areas for future research.

Coffee consumption and non-alcohol related fatty liver onset: a prospective study in the general population

S Zelber-Sagi et al, 2014

Translational Research

http://www.ncbi.nlm.nih.gov/pubmed/25468486

ABSTRACT

Retrospective studies suggest that coffee consumption may exert beneficial effects in patients with non-alcohol related fatty liver; however, prospective data supporting a protective role on liver steatosis development are lacking. In this study, we aimed to evaluate the association between coffee consumption and fatty liver onset in the general population. The analysis was performed both in a cross-sectional cohort (n = 347) and, prospectively, in a sub cohort of patients without fatty liver at baseline and followed-up for 7 years (n = 147). Fatty liver was diagnosed with abdominal ultrasound and liver steatosis was quantified noninvasively by hepatorenal index (HRI) and SteatoTest, whereas FibroTest was used to assess fibrosis degree. A structured questionnaire on coffee consumption was administrated during a face-to-face interview. Neither the incidence nor the prevalence of fatty liver according to ultrasonography, SteatoTest, and the HRI was associated with coffee consumption. In the cross-sectional study, high coffee consumption was associated with a lower proportion of clinically significant fibrosis ≥F2 (8.8% vs 16.3%; P = 0.038); consistently, in multivariate logistic regression analysis, high coffee consumption was associated with lower odds for significant fibrosis (odds ratio = 0.49, 95% confidence interval, 0.25-0.97; P = 0.041) and was the strongest predictor for significant fibrosis. No association was demonstrated between coffee consumption and the new onset of non-alcohol related fatty liver, but coffee intake may exert beneficial effects on fibrosis progression.

Association of Coffee Intake with Reduced Incidence of Liver Cancer and Death from Chronic Liver Disease in the US Multiethnic Cohort

V W Setiawan et al, 2014

Gastroenterology

http://www.ncbi.nlm.nih.gov/pubmed/25305507

ABSTRACT

BACKGROUND & AIMS

Coffee consumption has been proposed to reduce risk for hepatocellular carcinoma (HCC) and chronic liver disease (CLD), but few data are available from prospective, US, multi-ethnic populations. We evaluated the association of coffee intake with HCC and CLD in 162,022 African Americans, Native Hawaiians, Japanese Americans, Latinos, and whites in the US Multiethnic Cohort (MEC).

METHODS

We collected data from the MEC, a population-based prospective cohort study of more than 215,000 men and women from Hawaii and California, assembled 1993-1996. Participants reported coffee consumption and other dietary and lifestyle factors when they joined the study. During an 18-year follow up period, there were 451 incident cases of HCC and 654 deaths from CLD. Hazard rate ratios (RRs) and 95% confidence intervals (CIs) were calculated using Cox regression, adjusting for known HCC risk factors.

RESULTS

High levels of coffee consumption were associated with reduced risk of incident HCC and CLD mortality (Ptrend ≤.0002). Compared to non-coffee drinkers, those who drank 2-3 cups/day had a 38% reduction in risk for HCC (RR=0.62; 95% CI, 0.46-0.84); those who drank ≥4 cups per day had a 41% reduction in HCC risk (RR=0.59; 95% CI, 0.35-0.99). Compared to non-coffee drinkers, participants who consumed 2-3 cups coffee/day had a 46% reduction in risk of death from CLD (RR=0.54; 95% CI, 0.42-0.69) and those who drank ≥4 cups/day had a 71% reduction (RR=0.29; 95% CI, 0.17-0.50). The inverse associations were similar regardless of the participants' ethnicity, sex, body mass index, smoking status, alcohol intake, or diabetes status.

CONCLUSIONS

Increased coffee consumption reduces the risk of HCC and CLD in multi-ethnic US populations.

Coffee and liver health

F Morisco et al, 2014

Journal of Clinical Gastroenterology, Volume 48, Supplement 1: S87-90

http://www.ncbi.nlm.nih.gov/pubmed/25291138

ABSTRACT

Coffee is one of the most widely used beverages in the world. It includes a wide array of components that can have potential implications for health. Several epidemiological studies associate coffee consumption with a reduced incidence of various chronic diseases such as diabetes, cardiovascular diseases, and neurodegenerative diseases. Over the past 20 years, an increasing number of epidemiological and experimental studies have demonstrated the positive effects of coffee on chronic liver diseases.

Coffee consumption has been inversely associated with the activity of liver enzymes in subjects at risk, including heavy drinkers. Coffee favours an improvement in hepatic steatosis and fibrosis, and a reduction in cirrhosis and the risk of hepatocellular carcinoma. The mechanisms of action through which it exerts its beneficial effects are not fully understood. Experimental studies show that coffee consumption reduces fat accumulation and collagen deposition in the liver and promotes antioxidant capacity through an increase in glutathione as well as modulation of the gene and protein expression of several inflammatory mediators. Animal and in vitro studies indicate that cafestol and kahweol, 2 diterpens, can operate by modulating multiple enzymes involved in the detoxification process of carcinogens causing hepatocellular carcinoma. It is unclear whether the benefits are significant enough to “treat” patients with chronic liver disease. While we await clarification, moderate daily unsweetened coffee use is a reasonable adjuvant to therapy for these patients.

Coffee, tea and decaffeinated coffee in relation to hepatocellular carcinoma in a European population: Multi-centre, prospective cohort study

C Bamia et al, 2014

International Journal of Cancer

http://www.ncbi.nlm.nih.gov/pubmed/25219573

ABSTRACT

Inverse associations of coffee and/or tea in relation to hepatocellular carcinoma (HCC) risk have been consistently identified in studies conducted mostly in Asia where consumption patterns of such beverages differ from Europe. In the European Prospective Investigation into Cancer and nutrition (EPIC), we identified 201 HCC cases among 486,799 men/women, after a median follow-up of 11 years. We calculated adjusted hazard ratios (HR) for HCC incidence in relation to quintiles/categories of coffee/tea intakes. We found that increased coffee and tea intakes were consistently associated with lower HCC risk. The inverse associations were substantial, monotonic and statistically significant. Coffee consumers in the highest compared to the lowest quintile had lower HCC risk by 72% (HR: 0.28; 95% confidence intervals (CI): 0.16 to 0.50, P-trend <0.001). The corresponding association of tea with HCC risk was 0.41 (95% CI: 0.22 to 0.78, P-trend=0.003). There was no compelling evidence of heterogeneity of these associations across strata of important HCC risk factors, including hepatitis B or hepatitis C status (available in a nested case-control study). The inverse, monotonic associations of coffee intake with HCC were apparent for caffeinated (P-trend=0.009), but not decaffeinated (P-trend=0.45) coffee for which, however, data were available for a fraction of subjects.

Results from this multi-centre, European cohort study strengthen the existing evidence regarding the inverse association between coffee/tea and HCC risk. Given the apparent lack of heterogeneity of these associations by HCC risk factors and that coffee/tea are universal exposures; our results could have important implications for high HCC risk subjects.

Inverse Association of Total and Decaffeinated Coffee with Liver Enzymes in NHANES 1999 – 2010

Qian Xiao et el, 2014

Hepatology

http://www.ncbi.nlm.nih.gov/pubmed/25124935

BACKGROUND

Coffee may have hepatoprotective effects and higher coffee consumption has been associated inversely with levels of liver enzymatic markers. However, it is unclear whether decaffeinated coffee is also associated with liver enzymes.

METHODS

The study population included 27,793 participants, age 20 or older, in the US National Health and Nutrition Examination Survey (1999-2010). Coffee intake was evaluated by 24-hour dietary recall. Serum levels of aminotransferase (ALT), aminotransferase (AST), alkaline phosphatase (ALP) and gamma glutamyl transaminase (GGT) were measured. We examined the relationship between coffee intake and enzymatic levels using weighted multiple variable logistic (abnormally elevated levels of enzymes) and linear regression (continuous enzymatic levels).

RESULTS

Total coffee consumption was inversely associated with abnormal levels of all four liver enzymes and continuous levels of AST, ALP and GGT. Compared to those reporting no coffee consumption, participants reporting ≥3 cups per day had an odds ratio (OR) (95% confidence interval (CI)) of 0.75 (0.63, 0.89)), 0.82 (0.68, 0.98), 0.73 (0.55, 0.95) and 0.69 (0.57, 0.83) for abnormal levels of ALT, AST, ALP and GGT, respectively. Similar inverse associations were found with decaffeinated coffee intake and abnormal levels of ALT (OR ≥2 vs0 cup/d : 0.62 (0.41, 0.94)), AST (0.74 (0.49, 1.11)), and GGT (0.70, 0.49-1.00).

CONCLUSION

Higher intakes of coffee, regardless of its caffeine content, were associated with lower levels of liver enzymes. (Hepatology 2014;).

Coffee, alcohol and other beverages in relation to cirrhosis mortality: the Singapore Chinese Health Study

G B Goh et al, 2014

Hepatology

http://www.ncbi.nlm.nih.gov/pubmed/24753005

Limited experimental and epidemiologic data suggest that coffee may reduce hepatic damage in chronic liver disease. The association between consumption of coffee and other beverages, and risk of cirrhosis mortality was evaluated in The Singapore Chinese Health Study.

This is a prospective population-based cohort of 63,275 middle-aged and older Chinese subjects who provided data on diet, lifestyle and medical histories through in-person interviews using structured questionnaire at enrollment between 1993 and 1998. Mortality from cirrhosis in the cohort was ascertained through linkage analysis with nationwide death registry. After a mean follow-up of 14.7 years, 114 subjects died from cirrhosis; 33 of them from viral hepatitis B (29%), two from hepatitis C (2%), and 14 from alcohol-related cirrhosis (12%). Compared to non-drinkers, daily alcohol drinkers had a strong dose-dependent positive association between amount of alcohol and risk of cirrhosis mortality. Conversely, there was a strong dose-dependent inverse association between coffee intake and risk of non-viral hepatitis related cirrhosis mortality (p for trend=0.013). Compared to non-daily coffee drinkers, those who drank two or more cups per day had 66% reduction in mortality risk (HR=0.34, 95% CI=0.14-0.80). However, coffee intake was not associated with hepatitis B related cirrhosis mortality. The inverse relationship between caffeine intake and hepatitis B related cirrhosis mortality became null after adjustment for coffee drinking. The consumption of black tea, green tea, fruit juices or soft drinks was not associated with risk of cirrhosis death.

CONCLUSION

This study demonstrates the protective effect of coffee on non-viral hepatitis related cirrhosis mortality, and provides further impetus to evaluate coffee as a potential therapeutic agent in patients with cirrhosis. (Hepatology 2014;).

Impact of Coffee on Liver Diseases: A Systematic Review

Sammy Saab et al, 2014

Liver International

http://www.ncbi.nlm.nih.gov/pubmed/24102757

ABSTRACT

Coffee is one of the most commonly consumed beverages in the world. Its health benefits including improved overall survival have been demonstrated in a variety of disease states. To examine the association of coffee consumption with liver disease, a systematic review of studies on the effects of coffee on liver associated laboratory tests, viral hepatitis, non-alcohol related fatty liver disease (NAFLD), cirrhosis and hepatocellular carcinoma (HCC) was performed. Coffee consumption was associated with improved serum gamma glutamyltransferase, aspartate aminotransferase and alanine aminotransferase values in a dose dependent manner in individuals at risk for liver disease. In chronic liver disease patients who consume coffee, a decreased risk of progression to cirrhosis, a lowered mortality rate in cirrhosis patients, and a lowered rate of HCC development were observed. In chronic hepatitis C patients, coffee was associated with improved virologic responses to antiviral therapy.

Moreover, coffee consumption was inversely related to the severity of steatohepatitis in patients with non-alcohol related fatty liver disease. Therefore, in patients with chronic liver disease, daily coffee consumption should be encouraged.

INTRODUCTION

Coffee is a commonly consumed beverage worldwide. In the United States, over 50% of Americans consume coffee on a daily basis.[1] The commonly cited reasons for coffee consumption are its stimulatory effects, taste and aroma.[2,3] Recent data suggests that coffee consumption may have health benefits in a number of medical ailments. Long-term coffee drinkers may be at a decrease risk for type II diabetes, symptomatic gallstone disease, Parkinson's disease, heart disease and stroke.[2,4–7]

Moreover, coffee consumption is associated with decreased all-cause mortality.[8,9] In a recent analysis of the NIH-AARP Diet and Health Study data, a dose-dependent inverse association between coffee consumption and total mortality was described.[9] Men and women who drank 6 or more cups daily had a 10% and 15% decreased risk of death, respectively.

Chronic liver disease is major health burden in the United States, ranking 12th amongst the leading causes of death and accounting for over 30 000 deaths in 2009 alone.[10] Chronic liver disease affects approximately 15% of the US population and is a major economic strain through direct healthcare expenditures as well by indirect costs related to lost income due to premature death or disability.[11,12] Treatments for liver disease is often viewed with suspicion, and many patients often seek alternative therapies for their liver disorders.[13–15]

Coffee and non-alcohol related fatty liver disease: brewing evidence for hepatoprotection?

Chen S et al, 2014

Journal of Gastroenterology and Hepatology

http://www.ncbi.nlm.nih.gov/pubmed/24199670

ABSTRACT

Coffee is one of the most popular beverages in the world. Several studies consistently show that coffee drinkers with chronic liver disease have a reduced risk of cirrhosis and a lower incidence of hepatocellular carcinoma regardless of primary aetiology. With the increasing prevalence of non-alcohol related fatty liver disease (NAFLD) worldwide, there is renewed interest in the effect of coffee intake on NAFLD severity and positive clinical outcomes.

This review gives an overview of growing epidemiological and clinical evidence which indicate that coffee consumption reduces severity of NAFLD. These studies vary in methodology, and potential confounding factors have not always been completely excluded. However, it does appear that coffee, and particular components other than caffeine, reduce NAFLD prevalence and inflammation of non-alcohol related steatohepatitis.

Several possible mechanisms underlying coffee's hepatoprotective effects in NAFLD include antioxidative, anti-inflammatory, and antifibrotic effects, while a chemopreventive effect against hepatocarcinogenesis seems likely. The so-far limited data supporting such effects will be discussed, and the need for further study is highlighted.

Can Coffee Treat Liver Disease?

Rowen K. Zetterman, 2014

http://www.medscape.com/viewarticle/823276

Coffee and Mortality

More than 2.25 billion cups of coffee are consumed each day throughout the world. This requires harvesting and roasting 7 million tons of coffee beans every year.[1] Although coffee consumption varies from country to country, most Americans drink coffee daily. Despite early concerns about the deleterious effects of coffee on health, contemporary studies suggest that coffee is beneficial for many medical disorders, including Parkinson disease, diabetes mellitus, symptomatic gallbladder disease, stroke, and chronic liver diseases.[2]

Coffee contains caffeine, a methylxanthine that is also found in tea and other plants. The quantity of caffeine present in each cup of coffee varies depending on how the coffee is prepared, the type of coffee brewed, and whether it is ground or instant coffee. In general, from each cup of coffee, approximately 85 mg of caffeine[3] is absorbed in the stomach and small bowel and metabolized in the liver by cytochrome P450. The half-life of caffeine is 4-6 hours.

Current studies suggest that caffeine binds to adenosine receptors and reduces the development of hepatic fibrosis from liver injury by limiting stellate cell activation and the secretion of connective-tissue growth factors and collagen.[4] The diterpenes cafestol and kahweol present in coffee can increase cholesterol formation, but cafestol and kahweol are retained on paper filters during coffee brewing.

Coffee appears to have a significant effect on all-cause mortality. The National Institutes of Health-American Association of Retired Persons Diet and Health Study involving 229,119 men and 173,141 women demonstrated an inverse relationship between coffee consumption and mortality.[5] In other words, coffee drinkers had a reduction in mortality compared with non-coffee drinkers.

The men and women in the study were aged 50-71 years at baseline and were followed until death or the study end point. It was observed that coffee drinkers were also more likely to smoke cigarettes, a finding that has been documented in other studies. The inverse relationship of coffee consumption to overall mortality was dose-dependent and resulted in reduced deaths from heart disease, respiratory disease, stroke, injuries and accidents, diabetes mellitus, and infections. Cancer deaths were not reduced by coffee.

Coffee's Effect on Liver Tests

Alcohol (ethanol) consumption and cigarette smoking can increase gamma-glutamyl transferase (GGT) levels.[6] Coffee appears to reduce circulating levels of GGT.[7] When a Japanese study involving 12,687 general health examinees (7398 men and 5289 women) with no evidence of liver disease or elevated aminotransferase levels were surveyed for coffee consumption, a significant reduction in serum GGT activity was observed in men ($P < .001$), whereas a similar reduction of GGT in women was only weakly evident.[8] Men who were heavy consumers of alcohol-containing beverages had a reduction of GGT with coffee intake, whereas non-alcohol drinkers did not. Serum aminotransferase levels were also reduced in alcohol-consuming patients who drank coffee.[8,9] Green tea had no effect on GGT levels.

Another study of 1176 male office workers aged 40-59 years with no history of liver disease or abnormal aminotransferase levels[10] also had reduced circulating GGT levels from coffee intake. Elevated GGT levels were associated with increased body mass index, alcohol intake, cigarette smoking, and snacking between meals. Similar findings have been observed by others.[11]

Coffee in the Prevention of Cirrhosis

Chronic Liver Disease

Using the 1971-1975 National Health and Nutrition Examination Survey (NHANES), 9849 persons were followed for a mean of 19 additional years until hospitalization or death from chronic liver disease.[12] Each patient was surveyed for coffee or tea consumption (< 1 cup, 1-2 cups, or > 2 cups daily).

Chronic liver disease developed in 1.4% of the NHANES patients. A multivariate analysis showed that people drinking more than 2 cups of coffee or tea per day had less than one half the occurrence rate of chronic liver disease compared with those who consumed less than 1 cup per day (hazard ratio, 0.43; 95% confidence interval [CI], 0.24-0.78). This reduction in chronic liver disease was evident in persons with higher alcohol intake, those who were overweight, or those with diabetes mellitus or high iron saturation levels.

A similar cohort study of 125,580 multi-ethnic health plan members lacking known liver disease[13] were examined from 1978 to 1985 and then followed until a diagnosis of cirrhosis or the end of the calendar year 2002. Coffee consumption reduced the development of alcohol related cirrhosis but not non-alcohol related cirrhosis in this population. Tea consumption had no effect on either alcohol related or non-alcohol related cirrhosis.

Alcohol related Liver Disease

Alcohol related liver disease develops in patients with excessive alcohol intake; women are at greater risk for alcohol related hepatitis at lesser quantities of alcohol-containing beverages than are men. Fatty liver is common in patients with excessive alcohol intake. Alcohol related hepatitis or cirrhosis develops in 10%-20% of those with chronic alcoholism. The patient with alcohol related liver disease who is obese or has coexisting liver injury from chronic viral hepatitis may have an increased risk for advanced liver disease.

In a study of 749 alcohol-drinking patients who were referred for suspected liver disease,[14] alcohol consumption was described in units, with 1 unit equalling a beer, a glass of wine, or a measure of hard liquor. An intake of more than 3 units of alcohol daily was associated with an increase in cirrhosis in both men (odds ratio [OR], 4.3) and women (OR, 5.7). In this study, 63% of patients were mild to moderate alcohol drinkers (< 3 units daily) and 37% were heavy drinkers (> 3 units daily), with 25% of study participants consuming more than 5 units per day. The OR for liver disease from consumption of 3 or more units of alcohol daily was 2.4 (95% CI, 1.3-4.2).

People with ARLD who also drank coffee had a significant reduction in the risk for alcohol related cirrhosis. For those consuming more than 3 units of alcohol plus 0-2 cups of coffee daily, the OR for cirrhosis was 2.3 (95% CI, 1.2-4.4) compared with those drinking more than 3 units of alcohol and more than 2 cups of coffee per day, with an OR of 1.4 (95% CI, 0.6-3.6).

Of the 749 patients in the study, 8.1% were also hepatitis B surface antigen positive. The OR for development of advanced liver disease from hepatitis B virus alone was 0.2 (95% CI, 0.1-1.1); for those with hepatitis B virus who consumed more than 3 units of alcohol daily, it was 4.8 (95% CI, 1.9-12.4). Similarly, the 53% of patients who were hepatitis C virus (HCV)-RNA positive had an OR for advanced liver disease from HCV alone of 0.2 (95% CI, 0.2-0.8), whereas those with HCV who were drinking more than 3 units of alcohol daily had an OR for development of advanced liver disease of 3.2 (95% CI, 1.8-5.7).

Non-alcohol related Liver Disease

Obesity is an important contributing factor to the increasing prevalence of non-alcohol related fatty liver disease (NAFLD) in the United States,[15] although NAFLD can also develop in non-obese patients. NAFLD is associated with metabolic syndrome, obesity, increased waist circumference, diabetes mellitus, insulin resistance, and some medications[16] and is more prevalent in non-Hispanic white persons and Hispanic persons than in black persons.[12] Caffeine intake is associated with a reduced risk of developing NAFLD.[17]

In a study using ultrasonographic bright liver score as an indicator of NAFLD, 137 patients with NAFLD and 108 control patients were evaluated.[18] Study patients lacked evidence of hepatitis B, hepatitis C, significant alcohol consumption, diabetes mellitus, chronic renal disease, thyroid disease, or cancer. Insulin resistance was assessed using the homeostasis model-insulin resistance index. Less fatty liver disease was observed in coffee drinkers than in non-coffee drinkers. Coffee consumption had no relationship to insulin resistance.

In another study, 195 morbidly obese patients undergoing bariatric surgery were surveyed for consumption of regular and espresso coffee, decaffeinated coffee, tea, and chocolate, and these findings were compared with liver histology.[19] Liver tissue was obtained at operation, and NAFLD activity score, degree of fibrosis, and cirrhosis were determined.

Non-alcohol related steatohepatitis (NASH) was identified in 19.5% of operated patients. NAFLD activity score correlated with the presence of hepatic fibrosis ($P < .0001$). Coffee intake was unrelated to the findings of NASH or to the severity of inflammation as indicated by the NAFLD activity score.[20] However, fibrosis was reduced in coffee-drinking patients. Patients with the most severe hepatic fibrosis had significantly lower consumption of caffeine from coffee. Multivariate analysis found that the consumption of regular coffee was a significant factor in reducing hepatic fibrosis, whereas caffeine from espresso had no effect on fibrosis.

In another study, 400 patients aged 18-70 years who underwent ultrasonography and liver biopsy and completed a caffeine questionnaire (asking about all sources of caffeine)[21] were analysed in 4 groups: ultrasonography-negative for steatosis, steatosis only, NASH with stage 0-1 fibrosis, or NASH with stage 2-4 fibrosis.[22] Significantly lower caffeine consumption was observed in NASH patients with stage 2-4 fibrosis vs those with stage 1 fibrosis ($P < .016$). Only caffeine from coffee correlated with a lower risk for fibrosis. Coffee drinkers who also had low insulin resistance were less likely to have advanced fibrosis in the presence of NASH, suggesting that the protective effect of coffee may be related to insulin resistance, which has been observed by others.[23] Coffee drinkers who had high insulin resistance were not protected from developing hepatic fibrosis.

Coffee and Viral Hepatitis

Chronic HCV Infection

For patients with chronic HCV infection, coffee drinkers and those consuming caffeine-containing beverages are more likely to maintain normal aminotransferase levels ($P < .037$) or to reduce aminotransferase levels than are those with lower caffeine intake.[24] No chronic HCV-infected patient drinking decaffeinated coffee had improvement of aminotransferase levels. An assessment of daily caffeine intake compared with hepatic inflammation and fibrosis in liver histology in patients with chronic HCV found a reduction of inflammation with caffeine intake, but no change in fibrosis.[25] The finding of less hepatic fibrosis in patients with chronic HCV disease and high caffeine intake has been observed by others.[26]

The HALT-C trial assessed baseline coffee and tea intake in 766 chronic HCV-infected patients with bridging fibrosis or cirrhosis who were followed for 3.8 years.[27] Coffee intake varied from 0 to 5 or more cups of coffee daily (median intake, 1 cup/day). Outcomes included clinical worsening or a 2-point increase in the Ishak fibrosis score[28] at follow-up liver biopsy. High coffee intake was associated with male sex, white race, higher lifetime alcohol and cigarette use, increased tea consumption, lower baseline insulin-resistance score, lower fasting insulin levels, higher HCV RNA levels, and less severe liver disease (as measured by alpha-fetoprotein level, serum aspartate aminotransferase/alanine aminotransferase ratio, hepatic steatosis grade, and higher albumin levels). No association was found between coffee consumption and age, body mass index, cirrhosis status, diabetes mellitus, HCV genotype, inflammation score, platelet count, or prothrombin time.

In the HALT-C trial, an inverse relationship between 1 cup or more of daily coffee intake and progressive liver disease during follow-up was observed (relative risk, 0.88; 95% CI, 0.79-0.98). For those who consumed 3 or more cups of daily coffee compared with non-coffee drinkers, the relative risk for cirrhosis was further reduced (0.56; 95% CI, 0.33-0.97). No relationship was seen between progression and intake of green or black tea.

Chronic HBV Infection

Patients with chronic hepatitis B virus (HBV) disease were evaluated for liver stiffness by use of transient elastography, a non-invasive modality used to estimate liver fibrosis,[29] and interviewed about daily alcohol and caffeine intake from coffee, tea, soda, and chocolate. Excessive alcohol intake was defined as more than 30 g daily in men and 20 g daily in women. Of 1045 patients, 216 (21%) had advanced fibrosis according to elastography. There was no relationship of coffee consumption or alcohol intake with advanced fibrosis as determined by elastography.

Coffee in the Prevention of HCC

Primary liver cancer is the third leading cause of death in the world[30]; more than 600,000 new cases develop annually, with a survival rate of 3%-5%. Associations with the occurrence of liver cancer include cirrhosis, HBV and HCV, alcohol, alpha-1-antitrypsin deficiency, hemochromatosis, NAFLD, aflatoxin, and cigarette smoking. Coffee consumption appears to reduce the risk for hepatocellular carcinoma (HCC) in those at elevated risk.

There are numerous cohort and case/control studies of the relationship between coffee (caffeine) intake and protection from development of HCC.

Two cohorts of Japanese patients (one with 22,404 patients and the other with 38,703 patients) developed 117 primary liver cancers.[31] All patients completed a questionnaire about coffee, black and green tea use, alcohol consumption, and use of tobacco products. Occasional or daily coffee intake of 1 or more cups was associated with a reduced risk for primary liver cancer (P trend < .024). This reduction of cancer risk from coffee was also observed in those who had a history of liver disease (P = .47). Tea use was not associated with reduced liver cancer risk.

In a case/control study, patients with HCC were stratified by underlying HBV and HCV infection, age, sex, diet, history of liver disease, and lifestyle factors.[32] Occasional or daily coffee drinkers had a reduction of HCC compared with non-coffee drinkers (hazard ratio, 0.48; 95% CI, 0.36-0.66), and as daily coffee intake increased, the risk for HCC declined further (P trend < .001). Whereas patients with HCV disease had reduced HCC risk with coffee intake, patients with HBV disease in this group were not protected by coffee.

The protective effect of coffee on HCC risk was observed in another Japanese case/control study,[33] as well as in 2 cohort studies from Finland[34,35] and 1 from Singapore[35] that similarly observed a protective effect of coffee intake on the development of HCC. One study also observed that an elevated GGT level was associated with the development of HCC.[34] Patients who had both an elevated GGT and a low coffee intake had a 9-fold increase in liver cancer risk. The protective effect of coffee was seen regardless of whether coffee was boiled or filtered.[36]

A meta-analysis of 16 case/control and cohort studies of liver cancer risk in coffee drinkers found that the reduction in liver cancer risk occurred regardless of sex, alcohol use, or an underlying history of hepatitis or cirrhosis.[37] Another meta-analysis of 9 case/control and 7 cohort studies also demonstrated a reduction of HCC risk with coffee intake.[38]

Two case/control studies specifically looked at the protective effect of coffee on cancer risk in patients with HBV disease.[39,40] Whereas one demonstrated a 46% risk reduction for HCC with increasing intake of coffee (OR, 0.56; 95% CI, 0.30-0.97),[39] the other failed to show a reduction in HCC risk with coffee intake,[40] similar to that seen by others.[32] It is evident that further studies are needed to assess the risk for liver disease progression and development of HCC in patients with or without cirrhosis.

Summary: 2 Cups Daily?

Daily consumption of coffee appears to have an effect on developing fibrosis in some liver diseases, especially alcohol related liver disease and NAFLD. In addition to improving liver tests, such as GGT and ALT, coffee appears to inhibit the development of fibrosis in chronic hepatic inflammatory disorders. Whereas reduction of fibrosis and a potential effect on the outcome of patients with chronic HCV infection has been demonstrated, a similar benefit for the HBV-infected patient is not as clear. Additional studies of the effect of coffee on cirrhosis of HBV infection are needed.

Furthermore, coffee appears to reduce the risk for HCC in patients who are at risk for the disease. Once again, the evidence for any effect of coffee on HBV-related liver cancer needs additional study.

Whether the effect of coffee on liver disease is related to caffeine or some other agent in coffee is not clear. However, many studies have failed to show a significant effect of other caffeine-containing drinks, such as green or black tea, on reducing fibrosis or inhibiting the development of HCC.

Although we have treatments for many forms of chronic liver disease, alcoholics who continue to consume ethanol-containing beverages and patients with NAFLD who are unable to control their associated causal factors might benefit from drinking 2 or more cups of regular coffee daily. Whether this should be a boiled or filtered coffee preparation is probably up to the wishes of the patient. However, this recommendation for coffee is obviously an unapproved indication, and reaching a stronger conclusion will require many more studies. A careful conversation with patients at risk is needed before giving this advice.

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Effect of caffeine-containing beverage consumption on serum alanine aminotransferase levels in patients with chronic hepatitis C virus infection: a hospital based cohort study

Y Sasaki et al, 2013

PLoS One, Volume 8, Issue 12

http://www.ncbi.nlm.nih.gov/pubmed/24349501

ABSTRACT

INTRODUCTION

To date, there have been no prospective studies examining the effect of coffee consumption on serum alanine aminotransferase (ALT) level among individuals infected with the hepatitis C virus (HCV). We conducted a hospital-based cohort study among patients with chronic HCV infection to assess an association between baseline coffee consumption and subsequent ALT levels for 12 months.

MATERIALS AND METHODS

From 1 August 2005 to 31 July 2006, total 376 HCV-RNA positive patients were recruited. A baseline questionnaire elicited information on the frequency of coffee consumption and other caffeine-containing beverages. ALT level as a study outcome was followed through the patients' medical records during 12 months. The association between baseline beverage consumption and subsequent ALT levels was evaluated separately among patients with baseline ALT levels within normal range (≤45 IU/L) and among those with higher ALT levels (>45 IU/L).

RESULTS

Among 229 patients with baseline ALT levels within normal range, 186 (81%) retained normal ALT levels at 12 months after recruitment. Daily drinkers of filtered coffee were three times more likely to preserve a normal ALT level than non-drinkers (OR=2.74; P=0.037). However, decaffeinated coffee drinkers had a somewhat inverse effect for sustained normal ALT levels, with marginal significance (OR=0.26; P=0.076). In addition, among 147 patients with higher baseline ALT levels, 39 patients (27%) had ALT reductions of ≥20 IU/L at 12 months after recruitment. Daily drinkers of filtered coffee had a significantly increased OR for ALT reduction (OR=3.79; P=0.034). However, in decaffeinated coffee drinkers, OR could not be calculated because no patients had ALT reduction.

CONCLUSION

Among patients with chronic HCV infection, daily consumption of filtered coffee may have a beneficial effect on the stabilization of ALT levels.

Coffee consumption in NAFLD patients with lower insulin resistance is associated with lower risk of severe fibrosis

K Bambha et al, 2013

Liver International

http://www.ncbi.nlm.nih.gov/pubmed/24267865

BACKGROUND & AIMS

Coffee has inverse relationships with both type 2 diabetes and hepatic fibrosis in patients with non-alcohol related fatty liver disease (NAFLD). Relationships were explored between coffee intake and insulin resistance (IR) with respect to NAFLD histologic severity.

METHODS

We analyzed data from 782 adults (≥18 years) in the Non-alcohol related Steatohepatitis Clinical Research Network (NASH CRN) from 2004 to 2008. IR was assessed using the HOMA-IR. We modeled associations between coffee intake and NAFLD histologic severity using multiple logistic regression; and interactions between coffee and IR on NAFLD histology were explored.

RESULTS

Among 782 participants, 38% (n = 295) were men, 12% (n = 97) were Latino, mean age (± standard deviation) was 48 ± 12 years. Median BMI was 33.5 kg/m2 [interquartile range, 29.7-38.3] and median HOMA-IR was 4.3 [2.7-7.2]. Diabetes was present in 24% (n = 189). NASH was present in 79% (n = 616), and 25% (n = 199) had advanced fibrosis. The frequency of coffee intake (cups/day, cpd) was as follows: 0 cpd, n = 230 (29%); <1 cpd, n = 219 (28%); 1 to <2 cpd, n = 116 (15%); ≥2 cpd, n = 217 (28%). The effect of coffee on fibrosis varied with degree of IR (interaction P = 0.001). Coffee consumers with less IR, defined as HOMA-IR<4.3, had a lower odds of advanced fibrosis [OR = 0.64; 95% CI, (0.46-0.88), P = 0.001]. There was no protective effect of coffee on advanced fibrosis among individuals with higher HOMA-IR [OR = 1.06, 95% CI (0.87-1.28), P = 0.6].

CONCLUSIONS

Coffee intake is inversely associated with advanced fibrosis among NAFLD patients with lower HOMA-IR. Our findings warrant further investigation given the worldwide ubiquity of coffee intake.

Coffee consumption attenuates short-term fructose-induced liver insulin resistance in healthy men

V Lecoultre et al, 2013

American Journal of Clinical Nutrition

http://www.ncbi.nlm.nih.gov/pubmed/24257718

ABSTRACT

BACKGROUND

Epidemiologic and experimental data have suggested that chlorogenic acid, which is a polyphenol contained in green coffee beans, prevents diet-induced hepatic steatosis and insulin resistance.

OBJECTIVE

We assessed whether the consumption of chlorogenic acid-rich coffee attenuates the effects of short-term fructose overfeeding, dietary conditions known to increase intrahepatocellular lipids (IHCLs), and blood triglyceride concentrations and to decrease hepatic insulin sensitivity in healthy humans.

DESIGN

Effects of 3 different coffees were assessed in 10 healthy volunteers in a randomized, controlled, crossover trial. IHCLs, hepatic glucose production (HGP) (by 6,6-d2 glucose dilution), and fasting lipid oxidation were measured after 14 d of consumption of caffeinated coffee high in chlorogenic acid (C-HCA), decaffeinated coffee high in chlorogenic acid, or decaffeinated coffee with regular amounts of chlorogenic acid (D-RCA); during the last 6 d of the study, the weight-maintenance diet of subjects was supplemented with 4 g fructose · kg-1 · d-1 (total energy intake ± SD: 143 ± 1% of weight-maintenance requirements). All participants were also studied without coffee supplementation, either with 4 g fructose · kg-1 · d-1(high fructose only) or without high fructose (control).

RESULTS

Compared with the control diet, the high-fructose diet significantly increased IHCLs by 102 ± 36% and HGP by 16 ± 3% and decreased fasting lipid oxidation by 100 ± 29% (all $P < 0.05$). All 3 coffees significantly decreased HGP. Fasting lipid oxidation was increased with C-HCA and D-RCA ($P < 0.05$). None of the 3 coffees significantly altered IHCLs.

CONCLUSIONS

Coffee consumption attenuates hepatic insulin resistance but not the increase of IHCLs induced by fructose overfeeding. This effect does not appear to be mediated by differences in the caffeine or chlorogenic acid content. This trial was registered at clinicaltrials.gov as NCT00827450.

An epidemiological study of the association of coffee with chronic liver disease

H B Walton et al, 2013

Scottish Medical Journal, Volume 58 (4); 217-222

http://www.ncbi.nlm.nih.gov/pubmed/24215040

BACKGROUND AND AIMS

Chronic liver disease affects 855 people per million in the UK. Previous studies have reported that coffee appears protective against the development of abnormal liver enzymes, hepatic fibrosis and cirrhosis. The aim of this study, the first in a Scottish population, was to compare coffee consumption in patients with liver disease and that of control populations to determine correlations between coffee intake and the incidence of non-cancerous liver disease and with Child's-Pugh and model for end-stage liver disease (MELD) scores.

METHODS AND RESULTS

Two hundred and eighty-six patients attending the liver outpatient department at the Royal Infirmary of Edinburgh completed a questionnaire regarding coffee consumption and lifestyle factors. Control questionnaires were also completed by 100 orthopaedic outpatients and 120 medical students. Patients with cirrhosis ($n = 95$) drank significantly less coffee than those without cirrhosis ($p = <0.001$). There was no correlation between Child's-Pugh (-0.018) and MELD scores (-0.132) with coffee consumption.

CONCLUSION

Coffee drinking is associated with a reduced prevalence of cirrhosis in patients with chronic liver disease. However, there was no significant difference in the amount of coffee drunk by liver patients and the control groups. It is possible that by changing the amount of coffee drunk, the development of cirrhosis in liver disease could be postponed.

Association between elevated coffee consumption and daily chocolate intake with normal liver enzymes in HIV-HCV infected individuals: results from the ANRS CO13 HEPA VIH cohort study

M Patrizia Carrieri et al, 2013

Journal of Hepatology

http://www.ncbi.nlm.nih.gov/pubmed/23978720

BACKGROUND & AIMS

We used longitudinal data from the ANRS CO13 HEPAVIH cohort study of HIV-HCV coinfected individuals to investigate whether polyphenol rich foods intake through coffee and/or daily chocolate consumption could play a role in reducing liver enzymes levels.

METHODS

Longitudinal data collection included self-administered questionnaires and medical data (ASpartate aminoTransferase (AST) and ALanine aminotransferase (ALT) liver enzymes). Two analyses were performed to assess the association between coffee (≥3 cups a day) and daily chocolate intake and abnormal values of AST and ALT (AST or ALT >2.5x upper normal limit (UNL)) (N=990) over time, after adjustment for known correlates. Logistic regression models based on Generalised Estimating Equations were used to take into account the correlations between repeated measures and estimate adjusted odds ratio.

RESULTS

After adjustment, elevated coffee consumption and daily chocolate intake were independently associated with normal ALT (OR = 0.65; p = 0.04 and OR = 0.57; p = 0.04, for coffee and chocolate respectively), while only elevated coffee consumption was positively associated with normal AST values (p = 0.05). Nevertheless, the combined indicator of coffee and chocolate intake was most significantly associated with a 40-50% reduced risk of abnormal liver enzymes (p = 0.003 for AST; p = 0.002 for ALT).

CONCLUSIONS

Elevated coffee consumption and daily chocolate intake appear to be associated with reduced level of liver enzymes in HIV-HCV co-infected patients. Further experimental and observational research is needed to better understand the role that polyphenol intake or supplementation can play on liver disease and liver injury.

The association of coffee intake with liver cancer incidence and chronic liver disease mortality in male smokers

G Y Lai et al, 2013

British Journal of Cancer

http://www.ncbi.nlm.nih.gov/pubmed/23880821

BACKGROUND

Coffee intake is associated with reduced risk of liver cancer and chronic liver disease as reported in previous studies, including prospective ones conducted in Asian populations where hepatitis B viruses (HBVs) and hepatitis C viruses (HCVs) are the dominant risk factors. Yet, prospective studies in Western populations with lower HBV and HCV prevalence are sparse. Also, although preparation methods affect coffee constituents, it is unknown whether different methods affect disease associations.

METHODS

We evaluated the association of coffee intake with incident liver cancer and chronic liver disease mortality in 27 037 Finnish male smokers, aged 50-69, in the Alpha-Tocopherol, Beta-Carotene Cancer Prevention Study, who recorded their coffee consumption and were followed up to 24 years for incident liver cancer or chronic liver disease mortality. Multivariate relative risks (RRs) and 95% confidence intervals (CIs) were estimated by Cox proportional hazard models.

RESULTS

Coffee intake was inversely associated with incident liver cancer (RR per cup per day=0.82, 95% CI: 0.73-0.93; P-trend across categories=0.0007) and mortality from chronic liver disease (RR=0.55, 95% CI: 0.48-0.63; P-trend<0.0001). Inverse associations persisted in those without diabetes, HBV- and HCV-negative cases, and in analyses stratified by age, body mass index, alcohol and smoking dose. We observed similar associations for those drinking boiled or filtered coffee.

CONCLUSION

These findings suggest that drinking coffee may have benefits for the liver, irrespective of whether coffee was boiled or filtered.

Coffee Reduces Risk for Hepatocellular Carcinoma: A Updated Meta-analysis

F Bravi et al, 2013

Clinical Gastroenterology & Hepatology

http://www.ncbi.nlm.nih.gov/pubmed/23660416

BACKGROUND & AIMS

Coffee consumption has been proposed to reduce risk for hepatocellular carcinoma (HCC). We performed a meta-analysis of articles published through 2012 to provide updated information on how coffee drinking affects risk for HCC.

METHODS

We performed a PubMed/MEDLINE search of the papers published from 1966 through September 2012 for original articles, in English, on case-control or cohort studies that associated coffee consumption with liver cancer or HCC. We calculated the summary relative risk (RR) for any, low, and high consumption of coffee vs no consumption. The cut-off point for low vs high consumption was set to 3 cups per day in 9 studies and 1 cup per day in 5 studies.

RESULTS

The summary RR for any coffee consumption vs no consumption was 0.60 from 16 studies, comprising a total of 3153 HCC cases (95% confidence interval [CI], 0.50–0.71); the RRs were 0.56 from 8 case-control studies (95% CI, 0.42–0.75) and 0.64 from 8 cohort studies (95% CI, 0.52–0.78). Compared with no coffee consumption, the summary RR was 0.72 (95% CI, 0.61–0.84) for low consumption and 0.44 (95% CI, 0.39–0.50) for high consumption. The summary RR was 0.80 (95% CI, 0.77–0.84) for an increment of 1 cup of coffee per day. The inverse relationship between coffee and HCC risk was consistent regardless of subjects' sex, alcohol drinking, or history of hepatitis or liver disease.

CONCLUSION

Based on a meta-analysis of 16 studies, the RR for any coffee consumption vs no consumption is 0.60. The association might partly or largely exist because patients with liver and digestive diseases reduce their coffee intake. However, coffee has been shown to affect liver enzymes and development of cirrhosis, and could therefore protect against liver carcinogenesis.

The effect of coffee consumption on the development of hepatocellular carcinoma in hepatitis B virus endemic area

Jang E S et al, 2013

Liver International

http://www.ncbi.nlm.nih.gov/pubmed/23651110

BACKGROUND & AIMS

Coffee consumption is inversely related to the risk of cirrhosis or hepatocellular carcinoma (HCC). However, the protective effect of coffee drinking against the risk of HCC was not established in HBV-prevalent region. To elucidate the relationship between lifetime coffee consumption and the risk of HCC development under the consideration of replication status of HBV.

METHODS

A hospital-based case–control study was performed in 1364 subjects. A total of 258 HCC patients, 480 health-check examinees (control 1, HCE) and 626 patients with chronic liver disease other than HCC (control 2, CLD) were interviewed on smoking, alcohol and coffee drinking using a standardized questionnaire. HBV e-antigen (HBeAg) status and serum HBV DNA levels were measured in patients infected with HBV.

RESULTS

After adjustment for age, gender, obesity, DM, presence of hepatitis virus (except for HCE) and lifetime alcohol drinking/smoking, a high lifetime coffee consumption (>20 000 cups) was an independent protective factor against HCC, in each analyses using healthy and risky control groups respectively (HCE group, OR 0.56, 95% CI 0.33–0.95; CLD group, OR 0.55, 95% CI 0.36–0.85). However, the high coffee consumption did not affect the HCC risk in patients with HBV (OR 0.64, 95% CI 0.36–1.14) after adjustment for HBeAg status, serum HBV DNA level and antiviral therapy.

CONCLUSIONS

A high lifetime coffee consumption was negatively associated with a HCC development. However, this difference of coffee exposure with the HCC group was reduced in chronic hepatitis B patients by the dominant role of viral replication.

Dose- and Gender-dependent Interactions between Coffee Consumption and Serum GGT Activity in Alcohol Consumers

J Danielsson et al, 2013

Alcohol and Alcoholism

http://www.ncbi.nlm.nih.gov/pubmed/23492307

ABSTRACT

AIMS

Coffee consumption has been recently linked with decreased blood gamma-glutamyltransferase (GGT) activities and protection from alcohol related liver disease. To explore the relationship and dose response, we assessed the impacts of coffee and alcohol intake on serum GGT activity in apparently healthy men and women with varying levels of coffee and alcohol consumption.

METHODS

Data on coffee, alcohol consumption and serum GGT activities were collected from 18,899 individuals (8807 men and 10,092 women), mean age 48 years, range 25–74 years, who participated in a large national cross-sectional health survey. Body mass index, smoking index and age were used as covariates in all analyses.

RESULTS

Among the study population, 89.8% reported varying levels of coffee consumption; 6.9% were abstainers from alcohol, 86.1% moderate drinkers, 3.7% heavy drinkers and 3.3% former drinkers. In men, the elevation of GGT induced by heavy drinking (>280 g/week) was found to be significantly reduced by coffee consumption exceeding 4 cups per day. A similar trend was also observed among women, which however, did not reach statistical significance.

CONCLUSION

Coffee modulates the effect of ethanol on serum GGT activities in a dose- and gender-dependent manner. These observations should be implicated in studies on the possible hepatoprotective effects of coffee in alcohol consumers.

Consumption of coffee associated with reduced risk of liver cancer: a meta-analysis

L-X Sang et al, 2013

BMC Gastroenterology

http://www.ncbi.nlm.nih.gov/pubmed/23433483

ABSTRACT

BACKGROUND

Epidemiologic studies have reported inconsistent results regarding coffee consumption and the risk of liver cancer. We performed a meta-analysis of published case–control and cohort studies to investigate the association between coffee consumption and liver cancer.

METHODS

We searched Medline, EMBASE, ISI Web of Science and the Cochrane library for studies published up to May 2012. We performed a meta-analysis of nine case–control studies and seven cohort studies.

RESULTS

The summary odds ratio (OR) for high vs no/almost never drinkers was 0.50 (95% confidence interval (CI): 0.42–0.59), with no significant heterogeneity across studies (Q = 16.71; P = 0.337; I2 = 10.2%). The ORs were 0.50 (95% CI: 0.40–0.63) for case–control studies and 0.48 (95% CI: 0.38–0.62) for cohort studies. The OR was 0.38 (95% CI: 0.25– 0.56) in males and 0.60 (95% CI: 0.33–1.10) in females. The OR was 0.45 (95% CI: 0.36– 0.56) in Asian studies and 0.57 (95% CI: 0.44–0.75) in European studies. The OR was 0.39 (95% CI: 0.28–0.54) with no adjustment for a history of liver disease and 0.54 (95% CI: 0.46–0.66) after adjustment for a history of liver disease.

CONCLUSIONS

The results of this meta-analysis suggested an inverse association between coffee consumption and liver cancer. Because of the small number of studies, further prospective studies are needed.

Coffee consumption linked to reduced risk of liver cancer in patients with chronic hepatitis C

Digestive and Liver Disease

A study published in Digestive and Liver Disease reveals that coffee is associated with a reduced risk of liver cancer in patients with chronic hepatitis C

A new study, published in *Digestive and Liver Disease* and sponsored by The Institute for Scientific Information on Coffee (ISIC), assesses the mechanisms underlying the protective effects of coffee consumption, adding to current epidemiological evidence which suggests a protective role of coffee drinking towards cirrhosis development and/or progression to liver cancer. Hepatitis, the most common liver disease, is estimated to affect over 10 million people in Europe, with coffee consumption being linked to lower disease activity and a reduced risk of mortality for liver cirrhosis in patients with hepatitis C.

The study looked at 40 patients with chronic hepatitis C, randomised into two groups: the first consumed 4 cups of coffee/day for 30 days, while the second remained coffee “abstinent”. At day 30, the groups were switched over for a second month. Results showed that in patients with chronic hepatitis C, coffee consumption reduces oxidative DNA damage, increases apoptosis, leads to telomere elongation and DNA stabilisation, with lower collagen synthesis, factors which may play a role in reducing the risk of disease progression and of evolution to liver cancer.

Effects of coffee consumption in chronic hepatitis C: a randomized controlled trial

R Cardin et al, 2012

Digestive and Liver Disease

http://www.ncbi.nlm.nih.gov/pubmed/23238034

BACKGROUND

Coffee is associated with a reduced risk of hepatocellular carcinoma in patients with chronic C hepatitis. This prospective trial was aimed at assessing the mechanisms underlying coffee-related protective effects.

METHODS

Forty patients with chronic hepatitis C were randomized into two groups: the first consumed 4 cups of coffee/day for 30 days, while the second remained coffee "abstinent". At day 30, the groups were switched over for a second month.

RESULTS

At baseline, aspartate aminotransferase and alanine aminotransferase were lower in patients drinking 3–5 (Group B) than 0–2 cups/day (Group A) (56±6 vs 74±11/60±3 vs 73±7 U/L p = 0.05/p = 0.04, respectively). HCV-RNA levels were significantly higher in Group B [(6.2±1.5)×105 vs (3.9±1.0)×105 UI/mL, p = 0.05]. During coffee intake, 8-hydroxydeoxyguanosineand collagen levels were significantly lower than during abstinence (15±3 vs 44±1 8-hydroxydeoxyguanosine/10 5 deoxyguanosine p = 0.05 and 56±9 vs 86±21 ng/mL, p = 0.04). Telomere length was significantly higher in patients during coffee intake (0.68±0.06 vs 0.48±0.04 Arbitrary Units, p = 0.006). Telomere length and 8-hydroxydeoxyguanosine were inversely correlated.

CONCLUSION

In chronic hepatitis C coffee consumption induces a reduction in oxidative damage, correlated with increased telomere length and apoptosis, with lower collagen synthesis, factors that probably mediate the protection exerted by coffee with respect to disease progression.

Coffee & Health update the Liver Function topic with the latest research

The Institute for Scientific Information on Coffee (ISIC) has updated the Liver Function topic on the Coffee & Health website. The following new studies are now included:

In 2011, a case-control study conducted in a Chinese population of hepatitis C chronic carriers found that moderate coffee consumption reduced the risk of hepatocellular carcinoma by almost half with a significant dose-response effect, reducing the risk for moderate coffee drinkers by 59%.

A North American study to investigate the effects of dietary behaviour in non-alcohol related fatty liver disease patients, using four continuous cycles of the National Health and Nutrition Examination Surveys (NHANES 2001 -2008) found caffeine intake to be independently associated with a lower risk of non-alcohol related fatty liver disease NAFLD suggesting a potential protective effect.

A French study developed to evaluate the impact of caffeine consumption on activity grade and fibrosis stage in patients with chronic hepatitis C found that caffeine consumption greater than 408 mg/day was associated with reduced histological activity in these patients.

This is the first in a series of updates to the Coffee & Health website. For more information on the new research and to view the topic, click here.

High coffee intake is associated with lower grade non-alcohol related fatty liver disease: the role of peripheral antioxidant activity

Y Gutierrez-Grobe et al, 2012

Annals of Hepatology, Volume 11 (3)

http://www.ncbi.nlm.nih.gov/pubmed/22481454

BACKGROUND & AIMS

Some phytochemicals present in coffee have a potential antioxidant role which seems to protect the human body against cardiovascular diseases, liver disease and malignancies. Non-alcohol related fatty liver disease is a common disease with limited therapeutic options. This study investigated the antioxidant effect of coffee by measuring antioxidant enzymes and lipid peroxidation markers in patients with non-alcohol related fatty liver disease.

MATERIAL AND METHODS

We performed a case-control study at the University Hospital, Mexico City. Anthropometric, metabolic, dietary and biochemical variables of all patients were determined and compared. The presence of non-alcohol related fatty liver disease was established by ultrasonography. All patients completed a dietary questionnaire in order to determine their coffee consumption. Catalase, superoxide dimutase and thiobarbituric acid reactive substances were measured in all of the patients.

RESULTS

Seventy three subjects with and 57 without non-alcohol related fatty liver disease were included. Patients with non-alcohol related fatty liver disease had significantly higher body mass index, blood glucose, homeostasis model of assessment-insulin resistance and insulin values in comparison to patients without non-alcohol related fatty liver disease. On the one hand , there was a significant difference in coffee intake between the groups ($p < 0.05$, for all comparisons). There was no significant difference between groups in catalase (0.39 ± 0.74 vs. 0.28 ± 0.69 nM/min/mL), superoxide dismutase (5.4 ± 3.45 vs. 4.7 ± 2.1 U/mL) or thiobarbituric acid reactive substances (4.05 ± 1.87 vs. 3.94 ± 1.59IJM/ ml).

CONCLUSIONS

A high intake of coffee has a protective effect against non-alcohol related fatty Liver disease however there was no significant difference in the antioxidant variables analyzed.

Caffeine is protective in patients with non-alcohol related fatty liver disease

A Birerdinc et al, 2011

Alimentary Pharmacology Therapeutics

http://www.ncbi.nlm.nih.gov/pubmed/22059453

BACKGROUND

Non-alcohol related fatty liver disease (NAFLD), the hepatic manifestation of metabolic syndrome, is the most common cause of primary liver disease. Although recent studies have found that coffee drinking is protective against end stage chronic liver disease, there are scarce caffeine intake data in NAFLD specifically.

AIM

To investigate the effects of dietary behaviour in NAFLD patients, using four continuous cycles of the National Health and Nutrition Examination Surveys (NHANES 2001–2008).

METHODS

Using data from four continuous cycles of NHANES, dietary intake questionnaires that list 62 nutrition components. Logistic regression was used to identify independent predictors of NAFLD among nutrition components after adjustment for potential clinical confounders. All analyses were run using SAS 9.1 and SUDAAN 10.0 (SAS Institute Inc., Cary, NC, USA).

RESULTS

Of the 62 nutrient components used for the univariate analysis, 38% were significant (P-value <0.05) in NAFLD with caffeine consumption being higher in the control group (P-value <0.001). The multivariate analysis using demographics, clinical parameters and nutritional components found five factors independently associated with NAFLD [African American Race P-value <0.001); Male gender P-value <0.001); Obesity (BMI +/- 30) P-value <0.001); Caffeine intake (mg) P-value <0.001) and total plain water consumption (g) P-value £0.02)].

CONCLUSIONS

Our analysis shows that caffeine intake is independently associated with a lower risk for NAFLD suggesting a potential protective effect. These data necessitate further research to elucidate the mechanism by which caffeine can protect against NAFLD.

Association of coffee and caffeine consumption with fatty liver disease, non-alcohol related steatohepatitis, and degree of hepatic fibrosis.

J W Molloy et al, 2011

Hepatology

http://www.ncbi.nlm.nih.gov/pubmed/21987293

Coffee caffeine consumption (CC) is associated with reduced hepatic fibrosis in patients with chronic liver disease such as hepatitis C. The association of caffeine consumption with non-alcohol related fatty liver disease (NAFLD) has not been established.

The aim of this study was to correlate CC with the prevalence and severity of NAFLD. Patients involved in a previously published NAFLD prevalence study as well as additional non-alcohol related steatohepatitis (NASH) patients identified in the Brooke Army Medical Center Hepatology clinic were queried about their caffeine intake. A validated questionnaire for CC was utilized to assess for a relationship between caffeine and 4 groups: US negative (controls), bland steatosis/not-NASH, NASH stage 0-1, and NASH stage 204. 306 patients responded to the CC questionnaire. Average milligrams of total caffeine/coffee CC per day in controls, bland steatosis/not-NASH, NASH stage 0-1, and NASH stage 2-4 were 307/228, 229/160, 351/255, and 252/152 respectively. When comparing the patients with bland steatosis/not-NASH to those with NASH stage 0-1, there was a significant difference in caffeine consumption between the two groups ($p = 0.005$). Additionally, when comparing the patients with NASH stage 0-1 to those with NASH stage 2-4, there was a significant difference in coffee CC ($p = 0.016$). Spearmans rank correlation analysis further supported a negative relationship between coffee CC and hepatic fibrosis ($r = 0.215$, $p = 0.035$).

CONCLUSION

Coffee caffeine consumption is associated with a significant reduction in risk of fibrosis among NASH patients.

The effect of caffeine and alcohol consumption on liver fibrosis – a study of 1045 Asian hepatitis-B patients using transient elastography

A Ong et al (2011)

Liver International

http://www.ncbi.nlm.nih.gov/pubmed/21733095

BACKGROUND

Role of caffeine consumption in chronic hepatitis B virus (HBV)-infected patients and the interaction with alcohol consumption is unclear.

AIM

This study aimed to investigate the relationship between caffeine and alcohol consumption and liver stiffness in chronic HBV-infected patients.

METHODS

Chronic HBV-infected patients who underwent transient elastography examination in 2006–2008 were studied. Advanced fibrosis was defined as liver stiffness 49 kPa for patients with normal alanine aminotransferase (ALT) or 412 kPa for those with elevated ALT according to previous validation study. Caffeine and alcohol consumption was recorded using a standardized questionnaire. Excessive alcohol intake was defined as 30 g/day in men and 20 g/day in women.

RESULTS

The liver stiffness of 1045 patients who completed the questionnaire was 8.36.2 kPa. Two hundred and sixteen (20.7%) patients had advanced fibrosis. Ninety-five (19.0%) patients who drank Z1 cup of coffee had advanced fibrosis, compared with 121 (22.2%) patients who drank o1 cup (P = 0.21). The amount of caffeine intake had positive correlation with the amount of alcohol intake (rs = 0.167, Po0.001). Although 231 (22.1%) patients reported alcohol consumption, only 11 (1%) had excessive alcohol intake. The prevalence of advanced fibrosis among patients with mild to moderate alcohol intake (26, 18.8%) was comparable to that among non-drinkers (190, 21.0%) (P = 0.57).

CONCLUSION

Caffeine intake does not affect liver stiffness in chronic HBV-infected patients. Patients who drink coffee regularly tend to drink alcohol. Most chronic HBV infected patients do not have excessive alcohol consumption. The prevalence of advanced fibrosis among mild to moderate alcohol drinkers was low in this population.

Moderate coffee consumption reduces the risk of hepatocellular carcinoma in hepatitis B chronic carriers: a case-control study

W W Leung et al (2011)

Journal of Epidemiology & Community Health, Volume 65

http://www.ncbi.nlm.nih.gov/pubmed/20693491

BACKGROUND

Recent epidemiological studies have reported a dose-dependent protective effect of coffee on hepatocellular carcinoma (HCC) with risk reduction ranging from 30% to 80% in daily coffee drinkers compared with non-drinkers. This study examined whether coffee has a similar protective effect when consumed in moderate quantities in chronic hepatitis B virus (HBV) carriers, a group at high risk of developing liver cancer.

METHODS

A case control design was employed. 234 HBV chronic carriers (109 cases and 125 controls) were recruited from the Prince of Wales Hospital in Hong Kong from December 2007 to May 2008. Data collection included review of medical records and face-to-face interview. Univariate and multivariate logistic regressions adjusting for age, gender, cigarette smoking, alcohol use, tea consumption and physical activity were conducted with dose response analysis.

RESULTS

Moderate coffee consumption significantly reduced the risk of HCC by almost half (OR 0.54, 95% CI 0.30 to 0.97) with a significant dose response effect (c2¼5.41, df¼1, p¼0.02), reducing the risk for moderate drinkers by 59% (OR 0.41, 95% CI 0.19 to 0.89).

CONCLUSION

The findings provided evidence to support the protective effect of coffee consumption in moderate quantities in HBV chronic carriers.

Association of caffeine intake and histological features of chronic hepatitis C

C E Costentin et al (2010)

Journal of Hepatology, December 2010

http://www.journal-of-hepatology.eu/article/S0168-8278(10)00934-7/abstract

ABSTRACT

BACKGROUND & AIMS

The severity of chronic hepatitis C (CHC) is modulated by host and environmental factors. Several reports suggest that caffeine intake exerts hepatoprotective effects in patients with chronic liver disease. The aim of this study was to evaluate the impact of caffeine consumption on activity grade and fibrosis stage in patients with CHC.

METHODS

A total of 238 treatment-naïve patients with histologically-proven CHC were included in the study. Demographic, epidemiological, environmental, virological, and metabolic data were collected, including daily consumption of alcohol, cannabis, tobacco, and caffeine during the six month preceding liver biopsy. Daily caffeine consumption was estimated as the sum of mean intakes of caffeinated coffee, tea, and caffeine-containing sodas. Histological activity grade and fibrosis stage were scored according to Metavir. Patients (154 men, 84 women, mean age: 45±11years) were categorized according to caffeine consumption quartiles: group 1 (<225mg/day, n=59), group 2 (225-407mg/day, n=57), group 3 (408-678mg/day, n=62), and group 4 (>678mg/day, n=60).

RESULTS

There was a significant inverse relationship between activity grade and daily caffeine consumption: activity grade>A2 was present in 78%, 61%, 52%, and 48% of patients in group 1, 2, 3, and 4, respectively ($p<0.001$). By multivariate analysis, daily caffeine consumption greater than 408mg/day was associated with a lesser risk of activity grade>A2 (OR=0.32 (0.12-0.85). Caffeine intake showed no relation with fibrosis stage.

CONCLUSIONS

Caffeine consumption greater than 408mg/day (3 cups or more) is associated with reduced histological activity in patients with CHC. These findings support potential hepatoprotective properties of caffeine in chronic liver diseases.

Protective role of coffee in non-alcohol related fatty liver disease (NAFLD)

D Catalano et al (2010)

http://www.ncbi.nlm.nih.gov/pubmed/20165979

ABSTRACT

AIM

The benefits of coffee on abnormal liver biochemistry, cirrhosis and hepatocellular carcinoma have been reported, but there is a lack of satisfactory explanation. Thus, this study aims to investigate if coffee use has any relationship with bright liver, measured by ultrasound bright liver score (BLS), in patients with non-alcohol related fatty liver disease (NAFLD), and which relationship, if any, is present with BMI and insulin resistance.

METHODS

This study was performed on 245 patients, 137 with NAFLD and 108 controls. Coffee drinking was defined according to the absolute number of cups of coffee (only espresso coffee), and also graded as 1 (0 cups of coffee/day), 2 (1-2 cups of coffee/day) 3 (≥3 cups of coffee/day). Insulin resistance was assessed by homoeostasis model-insulin resistance index (HOMA).

RESULTS

Less fatty liver involvement is present in coffee vs. non-coffee drinkers. Odds ratios show that obesity, higher insulin resistance, lower HDL cholesterol, older age and arterial hypertension are associated with a greater risk of more severe BLS; to the contrary, coffee drinking is associated with less severe BLS. In the multiple logistic regression (MLR) model, number of cups of coffee, HOMA and BMI account for 35.8% of the variance to BLS. Coffee use is inversely associated with the degree of bright liver, along with insulin resistance and obesity, which, to the contrary, are directly associated with greater likelihood and severity of bright liver appearance.

CONCLUSIONS

A possible opposite, if not antagonistic, role of coffee with regard to overweightness and insulin resistance, similar to that reported in hepatocarcinoma and cirrhosis, is envisaged in the natural history of NAFLD.

Potential Counter Indications

Patrick Holford

The Truth about Coffee, 27 March 2014

Every day Britons drink 70 million cups of coffee – roughly two each per adult. Is it good or bad for you? Do coffee drinkers die young or live longer?

Many people get caught in the sugar, nicotine, caffeine trap, thinking this combination is good for energy. But in fact this combination feeds increasing fatigue, anxiety and weight gain. In my own research we surveyed over 55,000 people and found the two foods that most predict fatigue and stress are caffeinated drinks and sugary foods, both addictive substances. Many people become hooked on caffeine and sugar to keep going, gaining weight and losing health as a result.

But what are the long-term consequences? Do coffee drinkers live longer or die young? A study following the fate of almost 400,000 people found that, overall, coffee drinkers are more likely to die younger.[1] But is that a result of the coffee or associated habits? When the researchers adjusted for smoking, the risk of death actually reversed. Coffee drinkers tended to have a slightly lower risk of death, although the decreased risk didn't consistently become greater the more coffee was drunk. Slightly less risk was observed for deaths due to heart disease, respiratory disease, stroke, diabetes, and infections, but not for deaths due to cancer.

Coffee, diabetes and weight

However, as far as diabetes is concerned you may be pleased to know that there is now enough evidence to show that coffee actually decreases risk. In fact there have been eighteen studies involving almost half a million people that show overall that coffee, decaffeinated coffee and tea do slightly reduce risk of diabetes.[2] There are various theories as to why this might be since having a lot of caffeine itself isn't good for your health. Both tea and coffee are high in antioxidants, which is a potential benefit.

Two recent studies have shown that coffee doesn't cause the release of insulin, and may even reduce insulin resistance[3,4]. Interestingly, this effect is true for both coffee and decaf coffee, suggesting that it is isn't the caffeine that reduces insulin resistance. In fact, decaf may even help keep insulin producing cells healthy.

Before you hit the coffee though, there's something you need to know. Rather than reducing insulin resistance, if you combine coffee with a carb snack such as a croissant or a muffin, it has the opposite effect. To explore the consequence of this much loved combination researchers at Canada's University of Guelph gave volunteers a carbohydrate snack, such as a croissant, muffin or toast, together with either a decaf or coffee. Those having the coffee/carb combo had triple the increase in blood sugar levels and insulin sensitivity was almost halved[5]. This combination of high blood glucose levels and poor insulin function are a recipe for weight gain and increased diabetes risk because the excess blood glucose is dumped into storage as fat. This study shows that coffee with a carbohydrate snack is a dangerous combination. However, the decaf didn't make a difference to the glycaemic load of the snack.

One possible explanation for coffee's protective effect is that it might help weight loss. There is some evidence for this but it's not conclusive.[6] However, there is no question that having a coffee does tend to take the edge off hunger. This is because coffee promotes the release of the hormone glucagon, which helps raise glucose by breaking down glycogen. Coffee stimulates adrenal hormones and these, in turn, give you a burst of energy getting you ready to hunt. But, the trick is not to go hunting for sugar.

Coffee - Good or bad for cancer?

While some studies have shown an increased incidence of pancreatic cancer with coffee consumption,[7] further studies have not shown such an association. Over the last decade considerable research has been done on the cancer-coffee link. Most of these studies have come to the conclusion that coffee is unlikely to increase the risk of any cancer, except possibly for bladder cancer.

Coffee may also reduce risk of fatal prostate cancer. Drinking six cups of coffee a day can half the risk of fatal prostate cancer, according to a study published in the Journal of the National Cancer Institute.[8] Dr Wilson from the Harvard School of Public Health surveyed 48,000 health professionals every four years for two decades, and found that in addition to the dramatic risk reduction for lethal forms of the disease, each cup of coffee reduced overall prostate cancer risk by about 5%. Decaf coffee produced a similar reduction, so the protection is likely to be related to non-caffeine compounds of coffee.

However, caffeine may increase symptoms of fibrocystic breast disease, a common but benign breast condition - a significant association was found in those drinking four or more cups a day.[9]

Coffee raises inflammation

Caffeine also raises levels of the stress hormones adrenalin and cortisol and also substances that reliably indicate inflammation, such as interleukin-6, TNF, C-reactive protein and homocysteine[10]. A Greek study from 2004 that involved over 3,000 participants found that those consuming 200ml of coffee – two cups – had between 28 and 50 per cent higher levels of three kinds of inflammatory markers compared to non-coffee consumers[11]. It also raises blood pressure, although decaf does not.[12]

Coffee and Alzheimer's

There's no doubt that coffee raises homocysteine levels, which are strongly associated with increased risk of Alzheimer's disease.

A group of doctors from the University Hospital Nijmegen tested the effects of coffee by assigning volunteers to drink a litre of unfiltered coffee a day – that's about four cups – for two weeks. At the start of the two weeks their average H score was 12.8 μM, slightly above the national average of 10 to 11. At the end of the two weeks their H score was 14.[13]

A study by Dr Verhoef and co. at the Wageningen Centre for Food Sciences in the Netherlands showed that two cups of regular coffee increased homocysteine by 11% after only four hours, while caffeine tablets without coffee increased it by 5%.[14]

However, whether coffee drinking actually increases Alzheimer's risk is not yet clear. There are studies pointing both ways.

In summary, the research does suggest that, if you are going to drink coffee it is best to do it on its own, without either a sweetener or carb snack, and then wait at least 30 minutes before eating. Also, it is best to not overdo it, having perhaps one or two coffees a day at most. More than this is likely to make you more stressed and agitated.

Almost all the benefits of coffee are also reported for decaf, which eliminates a fair amount of the downsides. So, a decaf a day may actually help rather than hinder your health as far as diabetes and blood sugar control is concerned.

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Coffee - Good for cancer?

25 Oct 2013

A report today, based on 16 studies, says that drinking three cups of coffee may reduce the risk of liver cancer. Another concludes that coffee reduces prostate cancer risk. But it's not all good news.

Every day Britons drink 70 million cups of coffee – roughly two each per adult. But is it good or bad for you? Many people get caught in the sugar, nicotine, caffeine trap, thinking this combination is good for energy. But this combination feeds increasing fatigue, anxiety and weight gain. In my own research we surveyed over 55,000 people and found that the two foods that most predict fatigue and stress are caffeinated drinks and sugary foods, both addictive substances. Many become hooked on caffeine and sugar to keep going, gaining weight and losing health as a result. But what are the long-term consequences?

This recent review of 16 studies involving 3,153 people (not that many for surveys) concludes that three cups of coffee a day is associated with halving risk for liver cancer.

While some studies have shown an increased incidence of pancreatic cancer with coffee consumption, further studies have not shown such an association. Over the last decade considerable research has been done on the cancer-coffee link.

Coffee may also reduce risk of fatal prostate cancer. Drinking six cups of coffee a day can half the risk of fatal prostate cancer, according to a study published in the Journal of the National Cancer Institute. Dr Wilson from the Harvard School of Public Health surveyed 48,000 health professionals every four years for two decades, and found that in addition to the dramatic risk reduction for lethal forms of the disease, each cup of coffee reduced overall prostate cancer risk by about 5%.

Most of these studies have come to the conclusion that coffee is unlikely to increase the risk of any cancer, except possibly for bladder cancer.

Coffee and Diabetes

As far as diabetes is concerned you may be pleased to know that there is now enough evidence to show that coffee actually decreases risk. In fact there have been eighteen studies involving almost half a million people that do show overall that coffee, decaffeinated coffee and tea do slightly reduce risk of diabetes.

One plausible explanation for coffee drinkers having less diabetes and liver cancer could be that coffee drinkers use caffeine, instead of sugar, as their stimulant. Sugar both promotes diabetes and liver cancer. Perhaps coffee drinkers also drink less alcohol? Intuitively I expect this is not the case, but these kind of variables need to be explored to tease out why coffee may have a benefit.

Do coffee drinkers live longer or die young?

A study following the fate of almost 400,000 people has found that, overall, coffee drinkers are more likely to die younger. But is that a result of the coffee or associated habits? When the researchers adjusted for smoking, the risk of death actually reversed. Coffee drinkers tended to have a slightly lower risk of death, although the decreased risk didn't consistently become greater the more coffee was drunk. Slightly less risk were observed for deaths due to heart disease, respiratory disease, stroke, diabetes, and infections, but not for deaths due to cancer.

Does coffee help you lose weight?

There are various theories as to why this might be since having a lot of caffeine itself isn't good for your health. Both tea and coffee are high in antioxidants which is a potential benefit. Two recent studies have shown that coffee doesn't cause the release of insulin, and may even reduce insulin resistance. Interestingly, this effect is true for both coffee and decaf coffee, suggesting that it is isn't the caffeine that reduces insulin resistance. In fact, decaf may even help keep insulin producing cells healthy. Before you hit the coffee, there's something you need to know. Rather than reducing insulin resistance, if you combine coffee with a carb snack such as a croissant or a muffin, it has the opposite effect. To explore the consequence of this much loved combination researchers at Canada's University of Guelph gave volunteers a carbohydrate snack, such as a croissant, muffin or toast, together with either a decaf or coffee. Those having the coffee/carb combo had triple the increase in blood sugar levels and insulin sensitivity, the hormone that controls blood sugar levels, was almost halved.

One possible explanation for coffee's protective effect is that it might help weight loss. There is some evidence for this but it's not conclusive. However, there is no question that having a coffee does tend to take the edge off hunger. This is because coffee promotes the release of the hormone glucagon, which helps raise glucose by breaking down glycogen.

Coffee stimulates adrenal hormones and these, in turn, give you a burst of energy getting you ready to hunt. But, the trick is not to go hunting for sugar.

Decaf coffee produced a similar reduction, so the protection is likely to be related to non-caffeine compounds of coffee. However, caffeine may increase symptoms of fibrocystic breast disease, a common but benign breast condition - a significant association was found in those drinking four or more cups a day.

Coffee raises inflammation

Caffeine also raises levels of the stress hormones adrenalin and cortisol and also substances that reliably indicate inflammation, such as interleukin-6, TNF, C-reactive protein and homocysteine). A Greek study from 2004 that involved over 3,000 participants found that those consuming 200ml of coffee – two cups – had between 28 and 50 per cent higher levels of three kinds of inflammatory markers compared to non-coffee consumers. It also raises blood pressure, although decaf does not.

Coffee and Alzheimer's

There's no doubt that coffee raises homocysteine levels, which are strongly associated with increased risk of Alzheimer's disease. A group of doctors from the University Hospital Nijmegen tested the effects of coffee by assigning volunteers to drink a litre of unfiltered coffee a day – that's about four cups – for two weeks. At the start of the two weeks their average H score was 12.8 μM, slightly above the national average of 10 to 11. At the end of the two weeks their H score was 14. A study by Dr Verhoef and co. at the Wageningen Centre for Food Sciences in the Netherlands showed that two cups of regular coffee increased homocysteine by 11% after only four hours, while caffeine tablets without coffee increased it by 5%. However, whether coffee drinking actually increases Alzheimer's risk is not yet clear. There are studies pointing both ways.

In summary, the research does suggest that, if you are going to drink coffee it is best to do it on its own, without either a sweetener or carb snack, then wait at least 30 minutes before eating. Also, it is best to not overdo it having perhaps one or two coffees at most. More than this is likely to make you more stressed and agitated. Almost all the benefits of coffee are also reported for decaf, which eliminates a fair amount of the downsides. So, a decaf a day may actually help rather than hinder your health as far as diabetes and blood sugar control is concerned. The cancer studies didn't investigate the impact of decaf so we'll have to wait and see.

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Do coffee drinkers die young or live long?

17 May 2012

Every day Britons drink 70 million cups of coffee – roughly two each per adult. Is it good or bad for you? Is there an Increase or decrease in diabetes risk? Do coffee drinkers die young or live long? A new study reports.

Many get caught in the sugar, nicotine, caffeine trap, thinking this combination is good for energy. But this combination feeds increasing fatigue, anxiety and weight gain. In my own research we surveyed over 55,000 people and found that the two foods that most predict fatigue and stress are caffeinated drinks and sugary foods, both addictive substances. Many people become hooked on caffeine and sugar to keep going, gaining weight and losing health as a result. But what are the long-term consequences?

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There are various theories as to why this might be since having a lot of caffeine itself isn't good for your health. Both tea and coffee are high in antioxidants which is a potential benefit. Two recent studies have shown that coffee doesn't cause the release of insulin, and may even reduce insulin resistance. Interestingly, this effect is true for both coffee and decaf coffee, suggesting that it is isn't the caffeine that reduces insulin resistance. In fact, decaf may even help keep insulin producing cells healthy. Before you hit the coffee, there's something you need to know. Rather than reducing insulin resistance, if you combine coffee with a carb snack such as a croissant or a muffin, it has the opposite effect. To explore the consequence of this much loved combination researchers at Canada's University of Guelph gave volunteers a carbohydrate snack, such as a croissant, muffin or toast, together with either a decaf or coffee. Those having the coffee/carb combo had triple the increase in blood sugar levels and insulin sensitivity, the hormone that controls blood sugar levels, was almost halved.

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This report reviews the growing body of evidence that drinking moderate amounts of coffee can reduce your chance of developing liver disease and can also limit the rate at which liver disease progresses. Professional medical advice should be obtained before acting on any of the information contained in this report.

For more information about all aspects of liver disease or to see if you are at risk please visit our website www.britishlivertrust.org.uk

Or contact us at

Tel: 01425 481320
Email: info@britishlivertrust.org.uk
Facebook.com/britishlivertrust
Twitter@LiverTrust

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BRITISH LIVER TRUST

Pioneering Liver Health