



coffee&health

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coffee & health topics

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Liver function

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1. 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 alcoholic 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, alcoholic 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.

2. Liver function in Europe

Liver disease is estimated to affect 6% of the EU's population (approx. 29 million people)¹.

There are several different types of liver disease including hepatitis, alcohol-related diseases, fatty liver disease and cancer. Of these, liver cancer is the third most common cause of cancer-related deaths globally² and is the leading cause of death amongst patients with liver cirrhosis³.

Throughout Europe, alcohol remains the most important cause of liver disease, responsible for over 70% of all deaths⁴.



3. Coffee consumption and liver function

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 cancer⁶.

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 review⁷ concluded that patients with higher coffee consumption displayed a slower progression of fibrosis, especially those with alcoholic liver disease. Any slowing down in fibrosis development prolongs the function of the liver, delaying the progression to cirrhosis and irreparable liver damage.

Four recent patient studies^{8,9,10,11} 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 fibrosis⁸, cirrhosis⁹, non-alcoholic fatty liver disease¹⁰ and Hepatitis-C related liver disease¹¹.

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.



4. Potential mechanisms

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 alcoholic cirrhosis. Several potential mechanisms, which may be responsible for these effects, are currently under investigation.

The role of caffeine

There is some evidence for a potential role for caffeine on liver cancer. Two reviews^{7,12} and another recent study¹³ 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, alcoholic 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.

Possible roles for other coffee constituents

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 cancer¹⁴.

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 virus¹⁵. 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 alcoholic 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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