

## Coffee and Liver Function

### Overview

Scientific research published in the last decade suggests that coffee may help provide protection against the development of liver disease. Research points to properties found in coffee that are associated with a lower risk of liver cirrhosis, in particular alcoholic cirrhosis.

In a presentation at the Tea and Coffee Symposium in June 2003, Professor D'Amicis, head of Nutrition Information Unit at INRAN in Rome, Italy, drew attention to the possible protective effects of drinking coffee and liver disease, commenting that; "significant data shows us how drinking coffee could provide a real benefit to our health." The protective effects of coffee relate to:-

- **Cirrhosis of the liver;** a disease causing progressive damage and scarring of the liver tissue and function
- **Gallbladder disease;** by reducing the risk of gallstone formation
- **Liver enzyme activity in the blood;** a high liver enzyme is a recognised indicator of deterioration in the functioning of liver cells and possible development of disease of the liver.

In his presentation, Professor D'Amicis highlighted research (Klatsky et al. 1992), which showed coffee drinking was inversely related to alcoholic cirrhosis risk. This study, involving over 128,000 adults demonstrated that people drinking four cups of coffee per day experienced one fifth the risk of developing liver disease compared with those who did not drink any coffee. More recent studies have shown similar conclusions. A study by Corrao et al. (2001) found that it was specifically coffee, but not other beverages containing caffeine, thought to be the key factor in inhibiting the onset of both alcoholic and non-alcoholic cirrhosis of the liver. These findings were supported by Gallus et al. (2003) whose study confirmed the existence of a positive protective association between coffee drinking and liver cirrhosis.

Klatsky et al. (2006) published a further study involving over 125,000 people. The results support the hypothesis that there appears to be an ingredient in coffee that protects against liver cirrhosis, especially alcoholic cirrhosis.

Studies have also shown a reduced risk of gallstone disease among coffee drinkers. Leitzmann et al. (1999) showed that men who regularly drank two to three cups of coffee per day – filtered, instant, or espresso, had about a 30 to 40% reduction in the risk of gallstone disease. In a further study Leitzmann et al. (2002) reported a similar positive effect in women.

### **Coffee and Liver Function - Gallstones**

Gallstone disease affects millions of people around the world and cost \$billions to treat. Caffeine in coffee has been shown to have the ability to stimulate gallbladder contraction which could limit the risk of developing stones in the gallbladder. (Douglas et al. 1990; Lindaman et al. 2002)

In one large study, which was part of the Health Professionals Follow-up Study, consumption of coffee was monitored in 46,008 men aged between 40 – 75 years, all with no history of gallstone disease. The results of this study showed that men, who regularly drank two to three cups of coffee per day, had about a 30 to 40% reduction in risk of developing gallstone disease. For men who drank four cups per day, the reduction in risk was even more significant, in fact the risk was halved. (Leitzmann et al. 1999)

Leitzmann et al. (2002) also demonstrated that women who regularly drank coffee experienced similar reductions in gallstone risk. During a 20 year follow-up study in a group of 80,898 women aged between 34 and 59 years, again with no history of gallstone disease, results showed that with moderate consumption, coffee may play a role in the prevention of symptomatic gallstone disease also in women.

### **Coffee and Liver Function - Cirrhosis**

Our liver operates as one of the body's most efficient processing systems. It is the largest organ in the body and is essential in keeping us functioning properly. So, when studies show that individuals who drink coffee have a lower risk of cirrhosis of the liver (a disease causing progressive damage and scarring of the liver tissue and function), that could be of benefit to our health.

Studies have demonstrated that coffee drinking appears to be inversely related, or protective, to alcoholic cirrhosis of the liver. People drinking four cups of coffee per day were at one fifth the risk of those who did not drink any coffee. This study, involving 128,000 adults in Italy between 1978 and 1985, was part of the Kaiser Permanente Medical Care Programme which looked at risk profiles for the development of liver cirrhosis. (Klatsky et al. 1992)

Further studies (Corrao et al. 2001; Gallus et al. 2002; Klatsy et al. 2006; Tverdah 2003) suggest that it is specifically coffee, but not other caffeine containing drinks that is a key factor in reducing the risk of developing both alcoholic and non-alcoholic cirrhosis of the liver.

## Coffee and Liver Enzymes

In the same way as an oil filter keeps your car engine running smoothly, so a healthy liver helps keeping our bodies functioning efficiently. For those of us who wonder whether drinking a cup or two of coffee is beneficial, then the scientific data suggests that not only is coffee drinking in moderation perfectly safe, it may even have a role to play in supporting our liver functioning effectively. (Ruhl 2005)

A high liver enzyme activity in the blood is a recognised indicator that there has been deterioration in the functioning of liver cells.

The effects of regular coffee drinking on some liver enzymes were studied in a large number of subjects from the Italian general population and results showed that those drinking more than 3 cups of coffee a day had lower levels of liver enzymes in the blood than those drinking less than 3 cups per day and in those non coffee drinking individuals. (Casiglia et al. 1993)

## Frequently Asked Questions

### **Q. Is caffeine the active component in coffee influencing liver function?**

A. Caffeine does have a role to play, but there are other active substances, including the diterpenes; Cafestol and Kahweol and the antioxidants, which are thought to have a beneficial effect on liver function.

### **Q. Does drinking coffee permit us to drink more alcohol without the risk of developing liver cirrhosis?**

A. No. All medical advice makes clear that excessive alcohol consumption is detrimental to health. Adults, who choose to consume alcohol in moderation, should be aware of the recommended advice for safe consumption. Even though 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 have heard that the effects of alcohol can be different for women than for men. Is coffee effect different according to gender?**

A. Generally, the physiological effect of coffee drinking does not differ between the sexes, however, some groups – pregnant women, smokers, or women taking hormone replacement therapy do metabolise caffeine in a different time scale to those in the general population.

**Q. How many cups of coffee should I drink to assist my liver function?**

A. Although the research results are based on typical amounts of coffee consumption, it is too early to make recommendations concerning levels of coffee intake that may be protective for liver function. Drinking coffee in moderation is perfectly safe and can be enjoyed as part of a healthy diet and lifestyle.

**Q. Are the effects similar when drinking espresso, filter, or instant coffees?**

A. Studies on the effects of coffee and liver function have been conducted in relation to various types of coffee preparation including; filtered, instant and espresso coffee.

**Q. Are the effects of decaffeinated coffee on liver function as beneficial as those of regular coffee?**

A. Currently there are no published studies specifically investigating the effects of decaffeinated coffee and liver function.

**Q. I usually drink my coffee with milk and sugar. Can I also benefit from the effects reported for black coffee?**

A. There is no evidence from published studies to indicate that the addition of milk and/or sugar or their absence, affects the benefits associated with coffee and liver function.

## References

Casiglia, E., Spalao, P., Inocchio, G., Amrosio, B. Unexpected effects of coffee consumption on liver enzymes, *European Journal of Epidemiology*. 1993: 9; 293-297.

Corrao, G., Zamnoni, A., Bagnardi, V., D'Amicis, A., Klatsky, A. Coffee, caffeine and the risk of liver cirrhosis, *Annals of Epidemiology*. 2001: 7; 458-465

Douglas, B.R., Jansen, J.B., Tham, R.T., Lamers, C.B. Coffee stimulation of cholecystokinin release and gallbladder contraction in humans. *American Journal of Clinical Nutrition*. 1990: 52; 553-556.

Gallus, S., Tavani, A., Negri, E., La Vecchia, C. Does coffee protect against liver cirrhosis? *Annals of Epidemiology*. 2002: 12; 202-205.

Klatsky, A. L and Armstrong, M.A. Alcohol, smoking, coffee, and cirrhosis. *American Journal of Epidemiology*. 1992: 136; 1248-1257.

Klatsky, A. L., Morton, C., Udaltsova, N., Friedman G.D. Coffee, cirrhosis & transaminase enzymes. *Archives of Internal Medicine*. 2006:166;1248-1257.

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Leitzmann, M. F., Willett, W.C., Rimm, E.B., Stampfer, M.J., Spiegelman, D., Colditz G.A., Giovannuci E. A prospective study of coffee consumption and the risk of symptomatic gallstone disease in men. *Journal of the American Medical Association*. 1999: 281; 1190-1195.

Leitzmann, M. F., Willett, W.C., Rimm E.B., Stampher, M.J., Spiegelman, D., Colditz, G., Giovannuci, A. Coffee intake is associated with a lower risk of symptomatic gallstone disease in women. *Gastroenterology*. 2002: 123; 1823-1830.

Lindamann, B. A., Hinkhouse, M.M., Conklin, J.L., Cullen, J.J. The effect of phosphodiesterase inhibition on gallbladder motility in vitro. *Journal of Surg Research*. 2002: 105:102-108.

Ruhl, C.E., Everhart, J.E. Clinical liver, pancreas and biliary tract. Coffee and caffeine consumption reduce the risk of elevated serum alanine aminotransferase activity in the United States. *Gastroenterology*. 2005: 128: 24-32.

Tverdal, A., Skurtveit, S. Coffee intake and mortality from liver cirrhosis. *Ann Epidemiol*. 2003 (13)6; 419-423.