coffee&health

from the institute for scientific information on coffee

Good things in life:

Can coffee help in diabetes prevention?

An overview of the scientific evidence

www.coffeeandhealth.org

coffee & health

Type 2 Diabetes

FACTS ABOUT COFFEE AND TYPE 2 DIABETES

Regular coffee consumption is linked to a lower risk of type 2 diabetes

Studies in different populations have shown a statistically significant negative association for coffee and type 2 diabetes. In addition, a dose response effect is observed with a lower incidence of diabetes noted at higher levels of coffee consumption[1,2].

Six further epidemiological studies have since confirmed the negative association for coffee consumption[3,4,5,6,7,8].

Epidemiological evidence shows significant benefits from 3 to 4 cups of coffee a day

Drinking 3 to 4 cups of coffee per day is associated with an approximate 25% lower risk of developing type 2 diabetes, compared to consuming none or less than 2 cups per day[1,2].

Additional cups of coffee, up to 6-8 per day, associated with lower risk of diabetes

Specific diabetes focused research shows that every additional cup of coffee (regular or decaffeinated), up to 6-8 cups per day, is associated with a 5-10% lower risk of developing type 2 diabetes[1].

Decaffeinated coffee is also linked to a lower risk of type 2 diabetes

The majority of published studies which have evaluated the relationship between decaffeinated coffee drinking and risk of type 2 diabetes have reported negative associations[1,4,5,6].

More recently, a large US study with African American women and a French study also looked at the association for decaffeinated coffee. The latter study confirmed an association[5], however the former did not see a correlation[7].

coffee&health

from the institute for scientific information on coffee

EPIDEMIOLOGICAL EVIDENCE BEHIND THE FACTS

The evidence for the statistically significant negative association between coffee consumption and subsequent risk of type 2 diabetes is provided by the following papers:

- A large Dutch cohort study, specifically focused on diabetes, showed that those subjects drinking at least 7 cups of coffee per day were half as likely to develop type 2 diabetes[2]. This association was statistically significant. Since then, more than a dozen other studies have confirmed this finding in other populations.
- A systematic review with meta-analysis studied the available prospective epidemiological studies on type 2 diabetes and coffee, decaffeinated coffee and tea consumption in 457,922 individuals and 21,897 newly diagnosed cases of type 2 diabetes from 8 different countries. The results showed a statistically significant negative association between coffee consumption and subsequent risk of type 2 diabetes[1].
- Six further epidemiological studies have been published. All six, from different nationalities, confirmed the negative association with coffee consumption[3,4,5,6,7,8].
- Together, the significant negative observations from different population groups, and the dose response relation (lower incidence at higher consumption) are a strong indication for a true association between coffee consumption and the lower incidence of type 2 diabetes.

POTENTIAL MECHANISMS

Caffeine unlikely to play a role

Coffee and tea are the main sources of caffeine in the diet in most countries and it is difficult to separate an effect of caffeine from either coffee or tea. However, since decaffeinated coffee is reported to have a similar effect to regular coffee, it is unlikely that caffeine plays a role in the negative association for development of type 2 diabetes.

Potential antioxidant effect

Other coffee constituents, in particular antioxidants like chlorogenic acid and trigonelline, have been considered as potential mechanisms. These could have a role to play through an effect on subclinical inflammation.

A Finnish study tested the effects of a progressively increasing coffee consumption in obese volunteers in a medium term intervention trial. Coffee consumption appeared to have beneficial effects on some markers of subclinical inflammation considered to be risk factors for type 2 diabetes[9].

Because of its high content in antioxidant compounds and although still to be confirmed, coffee could contribute to the total antioxidant capacity of the diet that is necessary to reduce oxidative stress, in turn leading to unfavourable conditions for the development of type 2 diabetes[10,11]. Although this is yet to be confirmed, the research in this area is ongoing.

References

1 Huxley R. et al. (2009) Coffee, Decaffeinated Coffee, and Tea Consumption in Relation to Incident Type 2 Diabetes Mellitus. *Arch Intern Med*, 169: 2053-63.

2 van Dam R.M. et al. (2002) Coffee consumption and risk of type 2 diabetes mellitus. *Lancet*, 360: 1477-8.

3 Zhang Y. et al. (2011) Coffee consumption and the incidence of type 2 diabetes in men and women with normal glucose tolerance: The Strong Heart Study. *Nutr Metab Cardiovasc Dis*, 21: 418-423.

4 van Dieren S. et al. (2009) Coffee and tea consumption and risk of type 2 diabetes. *Diabetologia*, 52: 2561-9.

5 Sartorelli D.S. et al. (2010) Differential effects of coffee on the risk of type 2 diabetes according to meal consumption in a French cohort of women: the E3N/EPIC cohort study. *Am J Clin Nutr*, 91: 1002-12.

6 Oba S. et al. (2010) Consumption of coffee, green tea, oolong tea, black tea, chocolate snacks and the caffeine content in relation to risk of diabetes in Japanese men and women. *Br J Nutr*, 103: 453-9.

7 Boggs D.A. et al. (2010) Coffee, tea, and alcohol intake in relation to risk of type 2 diabetes in African American women. *Am J Clin Nutr*, 92: 960-6.

8 Hjellvik V et al. (2011) Boiled Coffee Intake and Subsequent Risk for Type 2 Diabetes. *Epidemiology*, 22(3):418-21.

9 Kempf K. et al. (2010) Effects of coffee consumption on subclinical inflammation and other risk factors for type 2 diabetes: a clinical trial. *Am J Clin Nutr*, 91: 950-7.

10 Mattila P. et al. (2006) Phenolic acids in berries, fruits, and beverages. *J Agric Food Chem*, 54: 7193-9.

11 Psaltopoulou T. et al (2010) The role of diet and lifestyle in primary, secondary, and tertiary diabetes prevention: a review of meta-analyses. *Rev Diabet Stud*, 7: 26-35.

www.coffeeandhealth.org

Basepoint Evesham, Crab Apple Way, Evesham, Worcestershire WR11 1GP

Tel: +44 (0) 1386 764777 Email: info@coffeeandhealth.org