SHORT REPORTS

Coffee and serum cholesterol

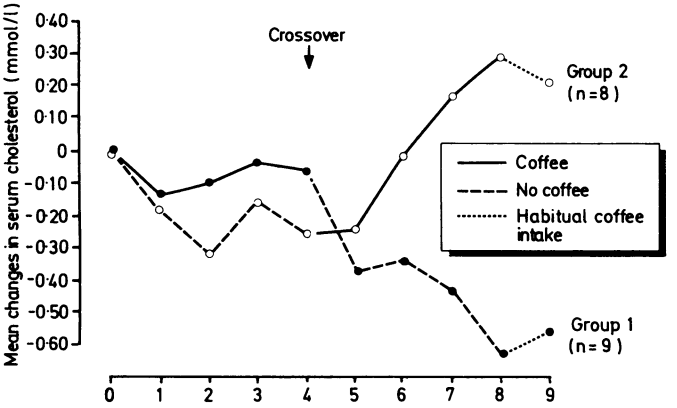
A strong and consistent association between the total cholesterol concentration and coffee consumption was observed in a cross sectional study of 14 581 subjects.[1] The effect of coffee drinking on the serum cholesterol concentration was therefore examined in a crossover experiment.

Methods and results

The study lasted nine weeks, being performed in 17 healthy volunteers divided into two groups. Group 1 started with coffee and changed to no coffee after four weeks. Group 2 followed the same procedure in inverted order. In the last week the participants returned to their habitual intake of coffee. Weekly serum samples were drawn and coffee consumption registered. The participants committed themselves to drink at least six cups of coffee daily during the coffee period and otherwise make no changes in their diet. Tea was allowed in the no coffee periods. The coffee consumed was predominantly black, boiled coffee. There were no drop outs.

Testing was done according to the preset protocol with paired t test on the difference ("coffee response"), within each participant, between the mean of the two last lipid determinations in the coffee period and the mean of the corresponding two determinations in the no coffee period. Cholesterol was measured blindly and directly by the enzymatic oxidase method. High density lipoprotein (HDL) cholesterol and triglycerides were assayed as described.[1]

In group 1 the serum cholesterol remained at the same concentration during the first four week coffee period. In the no coffee period the mean cholesterol concentration decreased from 5·33 to 4·93 mmol/l (206 to 190 mg/100 ml). In group 2 cholesterol decreased from 5·78 to 5·52 mmol/l (223 to 213 mg/100 ml) in the no coffee period and increased thereafter to 6·08 mmol/l (235 mg/100 ml) in the coffee period. The last week both groups moved toward baseline. The figure shows the weekly means of the difference from the subject's baseline in the two groups. The individual coffee response varied from 1·47 to −0·67 mmol/l (57 and 26 mg/100 ml) giving a mean of 0·45 (SD 0·48) mmol/l (17 (SD 19) mg/100 ml) ($p=0·0012$), or 8·7% of the overall mean cholesterol concentration. Only two had a negative response.



Mean changes from baseline in serum cholesterol concentration according to group and study period.

Conversion: SI to traditional units—Cholesterol: 1 mmol/l ≈ 39 mg/100 ml.

The difference between the last determination in the coffee and the no coffee period was 0·55 (SD 0·56) mmol/l (21 (SD 22) mg/100 ml), 10·1% of the overall mean cholesterol concentration. HDL cholesterol and triglycerides did not change significantly during the study period.

Comment

Since the acting substance in coffee is unknown, we accepted an open study. To minimise secular trends and variance, a design with two groups with inverted crossover was chosen. The participants' weights were unchanged during the study, indicating no systematic changes in food intake. Measurement of coffee intake and type of coffee consumed were not strictly standardised and hence a dose response between coffee and cholesterol could not be analysed. The study protocol stated a conservative estimate of the effect of coffee on serum cholesterol, as the response time seems to exceed four weeks.

The cholesterol concentration in group 1 did not change significantly during the first coffee period, probably owing to a too small increment in coffee consumption compared with the prestudy intake. Two participants used milk, one took sugar in the coffee, and four participants were daily smokers. None of these factors could be responsible for the increase in cholesterol concentration and no interaction with smoking was observed, as suggested by Heyden *et al.*[2]

Our findings agree with those of a study in man.[3] Experiments in animals, however, have shown conflicting results. Many studies have focused on caffeine, but neither the experiment in man,[3] nor the missing effect of tea in the present and other studies[4] provide any basis for singling out caffeine as the responsible culprit. We conclude that a daily intake of six or more cups of boiled coffee increases the serum cholesterol concentration in healthy subjects.

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[1] Thelle DS, Arnesen E, Førde OH. The Tromsø heart study: does cholesterol raise serum cholesterol? *N Engl J Med* 1983;**308**:1454-7.
[2] Heyden S, Heiss G, Manegold C, *et al.* The combined effect of smoking and coffee drinking on LDL and HDL cholesterol. *Circulation* 1979;**60**:22-5.
[3] Naismith DJ, Akinyanju PA, Szanto P, Yudkin J. The effect in volunteers of coffee and decaffeinated coffee on blood glucose, insulin, plasma lipids and some factors involved in blood clotting. *Nutr Metabol* 1970;**12**:144-51.
[4] Prineas RJ, Jacobs Jr DR, Crow RS, Blackburn H. Coffee, tea and VPB. *J Chron Dis* 1980;**33**:67-72.

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Suppression of foreign body granuloma by recombinant interferon

Injection or implantation of foreign substances into the tissues may result in the formation of granulomas. Two types are recognised—namely, simple non-allergic granulomas, which typically contain macrophages and giant cells around the foreign material, and allergic granulomas (considered to be a manifestation of delayed hypersensitivity), which resemble the granulomas of tuberculosis or sarcoidosis, showing a predominance of epithelioid cells and varying proportions of giant cells in addition to the foreign material.[1] We used recombinant interferon to treat a patient with widespread metastases from a malignant carcinoid tumour. We report the effect of interferon on an allergic foreign body granuloma in this patient.

Case report

A 48 year old housewife had undergone right partial pneumonectomy for a primary lung carcinoid tumour seven years previously. During the past 18 months she had developed increasing upper abdominal pain, and metastatic disease was confirmed. Computed tomography showed metastases of the liver (confirmed by needle biopsy) and upper para-aortic nodes. Though hepatic metastases were present, the carcinoid triad of flushing, diarrhoea, and wheezing was absent and urinary excretion of hydroxyindole acetic acid was repeatedly normal. The disease continued to progress despite the administration of conventional chemotherapy and fluorouracil for nine months. Two nodules 1 cm in diameter subsequently appeared around the site of the drain from her previous thoracotomy. A biopsy specimen from one of these showed numerous non-caseating epithelioid granulomas with giant cells containing birefringent, glassy material. Lymphocytic infiltration was sparse, and there was no evidence of metastatic carcinoid tumour. The birefringent particles had the microscopic appearance of talc (magnesium trisilicate), which had presumably been introduced into the tissues during surgery seven years previously.

Six weeks after the appearance of the nodules she underwent a trial of