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Coffee, Alcohol and Coronary Risk Factors

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Background

If you want to stick out your head, and expose yourself to flak from all corners; start examining coffee. The number of letters, particularly in Norwegian and Swedish journals and papers, and the level of emotions which this finding arouse came as a big surprise, and even if no other physiological effects can be attributed to coffee, it at least increases the heart rate both of the investigators and the letterwriters.

What is coffee, a drink without any known nutritional value. However, after grain and oil, the most important single commodity when finance is considered.

Frequency and Usage

The per capita consumption per year, varies from 2 kg in UK to 10–11 kg in the Nordic countries, the Netherlands and the USA are taking an in-between-position. This implies that coffee is the main source of fluid intake in some countries, and 10–12 kg/capita/year is equivalent of approximately half a litre or one pint of brewed ooffee per day.

Why this habit of taking in a drink without any nutritional value?

The coffeehouses were established 200–400 years ago. They were looked upon as intellectual resorts and, at that time, as an alternative to alcohol waterholes. In Norway around 1830 the mean alcohol intake per capita per year was 11–12 l pure liquor. Coffee was introduced as a means to reduce the alcohol intake. Obviously this must have had a public health impact. Later coffee has been associated with the cultural trait of a protestant country, and it has been looked upon as the common man's drink. Thus in the cultural setting of puritan, protestant Norway, coffee played, and still plays, an enormous part as a means of bridging the gap between people. Even measuring distances by saying that the length of a walk is equivalent to two coffee breaks gives an indication of the importance of this hot fluid.

With this in mind, coffee was taken in and registered via a questionnaire in The Second Heart Study in Tromsö in Northern Norway in 1979–80.

Coffee and Coronary Risk Factors

Altogether, 21,239 subjects were invited, 16,621 were examined and 14,667 of these completed the set of questions concerning, among others, dietary items. The objective, was to assess the external determinants of total cholesterol and other lipids.

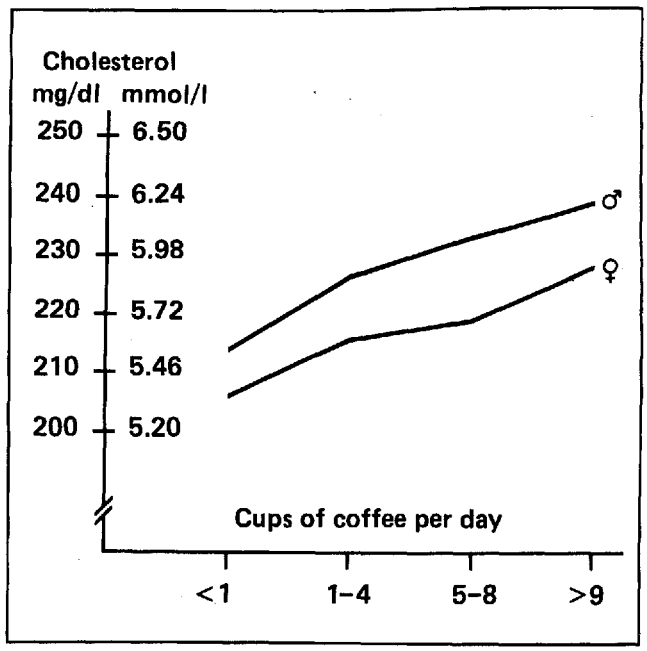

Fig. 1. Total cholesterol according to coffee consumption adjusted for body mass index, smoking, physical activity and age.

In a univariate analysis we found an increasing cholesterol level with increasing coffee consumption (Fig. 1) [1]. There was a direct linear relationship even if we adjusted for age, physical activity, body mass index, and smoking habits. Thus we had discovered a cross-sectional association, and how do we assess a result or a positive observation in a cross-sectional study?

The first thought when assessing this kind of observation is that it is due to a confounding variable, that some other third factor is the true culprit. That is that one variable already collected but so far not taken into account could be responsible for the positive association, or that factors you did not think of, the big unknown area for which you cannot correct or adjust, is the cause of the association.

The idea that this assocation should be due to a selection bias was found to be highly unlikely. That would imply that high cholesterol subjects with low coffee intake would actually be more prone to not attending the examination; not probable.

Any finding in a cross-sectional study may be due to chance, could this be a random event? Looking at the probability for this, it is not likely, but chance associations do cccur.

Is the finding due to a true relationship?
If so, there are a number of criteria which should be fulfilled to have this relationship established.
The confounding variables, which we did adjust for, did not change the pattern. What about other dietary items? Health conscious people might be great tea drinkers, and thereby abstain from coffee, was this the explanation? We took into account the dietary variables available, based upon the frequency questionnaire. The items included were milk consumption, type of milk consumed, bread, butter, margarine, fish, the use of minced meat or fat meat, and the frequency of alcohol intake.

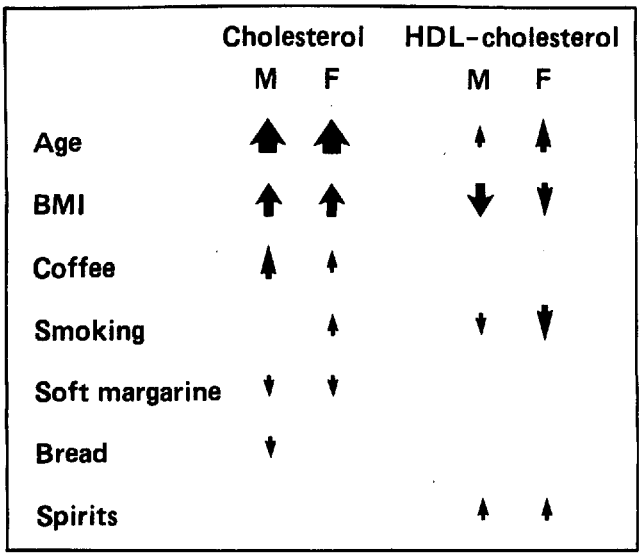

Fig. 2. Summary of a multiple regression analysis with total cholesterol and HDL cholesterol as dependent variables and some dietary factors as independent variables.

All these variables were included in a multivariate analysis, a multiple regression. Figure 2 shows the relative contribution to the variation of the total cholesterol and again coffee comes out as of major importance among the dietary items. So what? There are still a number of questions to be asked and answered to establish a true causal relationship.
Are these data consistent with data from other sources? Twenty two cross-sectional studies involving 130,000 persons from 8 different countries have reported their findings on the association between coffee consumption and cholesterol levels [2]. Results of these reports display a variety of trends in the association between coffee intake and serum cholesterol concentrations: Eight (36%; studies demonstrated a significant positive association in both sexes and five (23%) studies showed no association in men or women. In three other reports where both sexes were included, significant positive associations were observed only in women. The remaining six investigations examined only men with four (18%) reporting a significant correlation between coffee and cholesterol.

This unexplained incongruity of cross-sectional data points to a relationship between coffee and cholesterol in some populations, which needs to be further explored. The seven available human experiments showed the same low level of agreement in the results among small numbers of volunteers. Experiments involving different brewing methods suggest that a major part of the cholesterolincreasing effect can be explained by different brewing methods.
And this leads to the latest survey in the Tromsö population where brewing methods were also recorded. The preliminary data show that there is a relationship between brewing method and level of cholesterol associated with the coffee intake. Consumers mainly drinking coffee boiled in the north Scandinavian way do have higher cholesterol levels than those drinking the filter brew. The difference is sufficient to expect a 10–15% increased risk of coronary heart disease in those consuming the boiled version. The true impact of coffee on coronary heart disease has to be assessed in the followup of the population studies, but until now, in our effort to reduce the cholesterol level we recommend a change in brewing method to the more continental filter method, and in hypercholesterolaemic subjects a coffee-free periode of some four weeks can be used to assess the possible effect of coffee on that single individual.

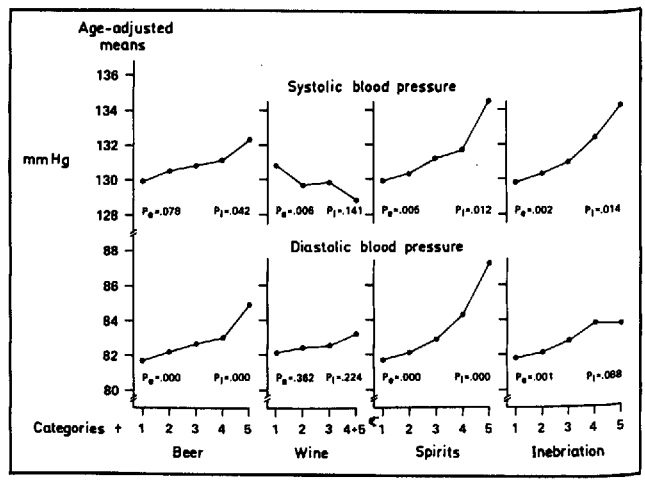

Fig. 3. Mean levels of risk factors in men according to alcolhol class.

Alcohol and Coronary Risk Factors

The relationship between coronary disease and alcohol has been debated for a long time. A number of studies have reported a U-shape relationship with those having a so-called moderate intake of alcohol (mostly 2–3 drinks per day) running the lowest risk for cardiovascular disease, and specially coronary heart disease [3]. On the other hand there are reports showing relationship between cerebrovascular disease and alcohol. The mechanism for this is unclear, but an increasing number of reports have shown that alcohol may have a blood pressure increasing effect. The following is a

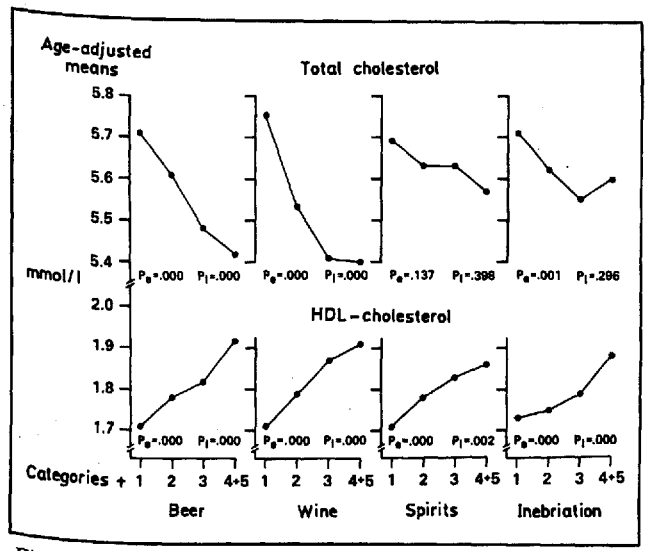

Fig. 4. Mean levels of risk factors in women according to alcohol class.

short presentation of some of the cross-sectional data from the Tromsö Heart Study on the relationship between alcohol intake and coronary risk factors [4].

The alcoholinformation has be grouped according to type of alcohol and frequency of being intoxicated or inebriated. The mean levels of blood lipids, and blood pressure are shown according to alcohol intake (Fig. 3 and 4).

There was an increasing level of HDL cholesterol in both sexes with increasing alcohol disregarding type of alcoholbeverages. There was also a striking decrease in total cholesterol with wine consumption in this material again particular for women. Blood pressure increased in men whereas the pattern was inconsistent in women. In general the results confirm what was already known, expect that the blood pressure increase with alcohol intake was less than expected and the decrease in total cholesterol has to my knowledge not been previously reported.

It is probable that the positive relationship between wine intake and total cholesterol is due to some other factors. The wine consumers in this population could be different in other ways e.g. social class, etc.

The blood pressure increase is sufficiently large to represent true differences and it is likely that this will be reflected in different insidences of strokes according to alcohol intake in the future. There is a message here to the general practitioner who is responsible for treating high blood pressure; namely to look more actively for alcohol intake among the hypertensive patients.

Both coffee and alcohol are so frequently distributed and consumed by so many of our patients and in the general population that any risk increase even if it maybe very small may have a large impact on the public health agenda. However the last has not been said on this issue and further results may be expected in the future.

Summary

In a number of studies coffee consumption has been shown to be related to total cholesterol levels. The finding is not consistent and the possibilities for a causal relationship is discussed. The U-shaped relation between risk of coronary heart disease and alcohol consumption is also reviewed as well as the possible relationship between some of the coronary risk factors and alcohol consumption.

Résumé

Café, alcool et facteurs de risque de maladies coronariennes

De nombreuses études sur la consommation de café ont montré une relation directe avec le cholestérol total. Les résultats ne sont pas très concordants. La possibilité d'une relation causale est étudiée. Une courbe en U entre les facteurs de risque de maladies coronariennes et la consommation d'alcool est discutée, ainsi que les relations possibles entre certains facteurs de risque coronaires et la consommation d'alcool.

Zusammenfassung

Kaffee, Alkohol und die koronaren Risikofaktoren

In verschiedenen Studien fand sich eine direkte Beziehung zwischen Kaffeekonsum und dem Cholesterinspiegel. Die Resultate sind jedoch nicht übereinstimmend. Möglichkeiten einer kausalen Relation werden untersucht. Die U-förmige Beziehung zwischen Alkoholkonsum und dem koronaren Risiko wird überprüft, ebenso wie die Möglichkeit einer Beziehung zwischen Alkoholkonsum und den klassischen Risikofaktoren.

References

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