

CLINICAL @LERT

Review: substantial coffee consumption was associated with a lower risk of colorectal cancer in the general population

Giovannucci E. Meta-analysis of coffee consumption and risk of colorectal cancer. *Am J Epidemiol* 1998 Jun 1;147:1043–52.

Question

Is coffee consumption associated with the risk of colorectal cancer in the general population?

Data sources

Studies were identified by searching Medline and CANCELIT (to June 1997) and scanning bibliographies of relevant studies.

Study selection

Studies were selected if they reported on coffee consumption and colorectal cancer risk and if they provided risk estimates with confidence intervals that were adjusted for age and sex.

Data extraction

Data were extracted on study years, study design, type of controls (hospital or population based), setting, coffee consumption, and colorectal cancer risk.

Main results

12 case control studies (6 hospital based and 6 population based) and 5 cohort studies met the inclusion criteria. High categories of coffee consumption (mean 4 cups [948 ml]/d in 13 studies that reported amount of coffee consumed) were compared with low categories of coffee consumption (<1 cup [237 ml]/d) and the results were pooled using a random effects model. The mean follow up was {6 years (range 1 to 20 y)}*. Substantial coffee consumption was associated with a lower risk of colorectal cancer ($p<0.001$); this association did not exist when results from the cohort studies only were pooled ($p=0.83$)

(table). The association remained for studies from northern Europe (5 studies, $p<0.001$), southern Europe (5 studies, $p=0.003$), and Asia (2 studies, $p<0.001$) but not for studies from the US (3 studies, $p=0.49$) or studies of special populations (i.e., Seventh Day Adventists and Latter-day Saints) in the US (2 studies, $p=0.10$) (table).

Conclusion

Substantial coffee consumption was associated with a lower risk of colorectal cancer in the general population.

*Follow up calculated from data in article.

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For correspondence: Dr E Giovannucci, Channing Laboratory, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School, 181 Longwood Avenue, Boston, MA 02115, USA. Fax +1 617 432 2435.

Risk of colorectal cancer associated with substantial coffee consumption

Study type	No of studies	Relative risk (95% CI)†
All studies	17	0.76 (0.66 to 0.89)
Cohort	5	0.97 (0.73 to 1.29)‡
Case control	12	0.72 (0.61 to 0.84)
Study country	No of studies	Relative risk (CI)†
Northern Europe	5	0.65 (0.53 to 0.79)
Southern Europe	5	0.72 (0.57 to 0.89)
US	3	0.87 (0.59 to 1.29)‡
Asia	2	0.57 (0.44 to 0.75)
Special populations¶	2	1.45 (0.93 to 2.26)‡

†Relative risk was estimated by using odds ratios for case control studies and relative risks for cohort studies.

‡Not significant.

¶Seventh Day Adventists and Latter-day Saints.

Commentary

Due to public health concerns and import costs, coffee prohibition was introduced in Finland/Sweden during the 18th century. After the ban was lifted two condemned men were reprieved. One was put on daily consumption of coffee and the other acted as a control. Both were lost to follow up 20 years later when they left prison without any signs of harmful effects including colorectal cancer. This study highlights the difficulties in assessing the impact of coffee on health—the need for long term follow up, a strictly controlled environment to ensure that controls are not exposed to any coffee products, and the problem of sufficient statistical power. In spite of the lack of any adverse effects in the Swedish study, the notion that coffee is bad for you has been a dogma among physicians since the 18th century; one just has to turn over the right

stone to add coffee consumption to alcohol misuse, tobacco, and unprotected sex.

This preconception has frequently created problems for researchers trying to deal with the results of an inverse association in studies of coffee and colorectal cancer. In most instances such findings have been attributed to chance. It is therefore of great value that the recent meta-analysis by Giovannucci *et al* has summarised studies which have explored the association between coffee and colorectal cancer. The authors are able to show, with the exception of two studies with questionable internal validity, a consistent protective effect. This association is independent of geographic location, sex, and control selection, and persists unaltered in those studies which have been adjusted for potential confounders. Moreover, there is

also an even stronger inverse association between coffee and adenomas.

In interpreting their findings the authors are almost as reluctant as their predecessors to infer a causal inverse effect. Equal weights are given to a causal protective effect and the hypothesis that the protective effect is the result of a specific phenotype, which allows high coffee consumption and is also associated with a decreased risk for colorectal cancer. However, whatever the biological mechanism, coffee drinkers are at lower risk of developing colorectal cancer compared with those who have chosen or been forced into a life without this stimulus.

A EKBOM
Department of Medical Epidemiology,
Karolinska Institute,
PO Box 281,
SE-171 77 Stockholm,
Sweden