

Green Tea Found to Cut All-Cause and Cardiovascular Mortality

By Judith Groch, Senior Writer, MedPage Today

Reviewed by [Robert Jasmer, MD; Assistant Professor of Medicine, University of California, San Francisco](#)

September 12, 2006

SENDAI, Japan, Sept. 12 -- Cup after cup of green tea earned a high grade for reducing all-cause and cardiovascular mortality in a study here, but cancer mortality drew a blank.

Compared with participants who consumed less than one cup of green tea a day, those who drank five or more cups had a risk of all-cause mortality that was 16% lower during 11 years of follow-up and 26% lower for cardiovascular deaths during seven years of follow-up, according to a report in the Sept. 13 issue of *JAMA*.

In contrast, green tea, sipped or quaffed, came up null for an association with cancer death rates, said Shinichi Kuriyama, M.D., Ph.D., of the Tohoku University School of Public Policy here, and colleagues.

Although the inverse association for green tea consumption was observed in both sexes, the associations of all-cause and cardiovascular disease mortality were strongest among women ($P=0.03$ for interaction with sex), the researchers said.

These findings came from the Ohsaki National Health Insurance Cohort Study, a population-based prospective study started in 1994. The study included 40,530 adults (ages 40 to 79) in Northeastern Japan, where 80% of the population drinks green tea and more than half consumes three or more cups a day. The participants had no history of coronary heart disease, stroke, or cancer at baseline.

Over 11 years of follow-up, 1995 through 2005, (follow-up rate, 86.1%), 4,209 participants died. Over seven years, 1995 to 2001, (follow-up rate, 89.6%), 892 participants died of cardiovascular disease while 1,134 participants died of cancer.

Among men, the multivariate hazard ratios of mortality from all causes compared with those who consumed less than one cup a day of green tea, associated with different green tea consumption frequencies, were 1.00 (reference) for less than one cup/day, 0.93 (95% confidence interval 0.83-1.05), for one to two cups/day, 0.95 (CI, 0.85-1.06), for three to four cups/day, and 0.88 (CI, 0.79-0.98) for five or more cups/day, respectively ($P=0.03$ for trend).

The corresponding all-cause data for women were 1.00, 0.98 (CI, 0.84-1.15), 0.82 (CI, 0.70-0.95), and 0.77 (CI, 0.67-0.89), respectively ($P<0.001$ for trend).

The inverse association with cardiovascular disease mortality was stronger than that for all-cause mortality, and this association was also stronger in women ($P=0.08$ for interaction with sex), the researchers said.

In women, the multivariate hazard ratios of cardiovascular disease mortality across increasing green tea consumption categories were 1.00, 0.84 (CI, 0.63-1.12), 0.69 (CI, 0.52-0.93), and 0.69 (CI, 0.53-0.90),

respectively ($P=0.004$ for trend).

The reason for the discrepancy between men and women is uncertain, the researchers said, but may be linked to cigarette smoking, still more common among men. The finding of an inverse association appeared to be a threshold effect rather than a dose-response relationship, such that persons who consumed at least one cup of tea may receive some benefit, the researchers suggested.

Among the types of cardiovascular disease mortality for men and women, the strongest inverse association was observed for stroke mortality, specifically cerebral infarction, the researchers said.

In contrast, the hazard ratios of cancer mortality were not significantly different from 1.00 in all green-tea categories compared with the lowest-consumption category.

There were weak or neutral relationships for mortality for black tea and oolong tea, the researchers said, suggesting a specific role for substances that are rich in green tea. However, smaller consumption of the non-green teas may have contributed in part to their lack of association with mortality, they added.

The beneficial effect of green tea on cardiovascular disease mortality could be mediated by beneficial effects on cardiovascular risk factors, such as hypertension and obesity. However, the results indicate that these risks were not a factor, the researchers said.

Other mechanisms might play a role, they suggested. Green tea polyphenols, especially (-)-epigallocatechin-3-gallate, have been extensively studied and might explain the observed association of reduced all-cause mortality and cardiovascular mortality, irrespective of risk profiles.

A number of biological mechanisms have been proposed, including radical scavenging and antioxidant properties for different models of chronic disease. For example, they said, it is also possible that given the effect of green tea on cerebral infarction but not cerebral hemorrhage, that green tea polyphenols might directly affect atherosclerosis itself, irrespective of traditional cardiovascular risk profiles.

Among the study's limitations, the researchers noted that the number of cases of cardiovascular and cancer mortality was modest, suggesting that the study may not have had sufficient power to detect significant results in coronary heart disease or in detecting small changes in cancer risk.

Although the questionnaires were self-administered, they said, some misclassification of consumption was possible, although the impact would tend to lead to underestimation.

Finally, they noted that healthy or unhealthy behavior in association with green tea drinking could have confounded the results. However, they said, all Japanese people consume green tea as one of their favorite beverages, and it is unlikely that consumption was driven by health concerns.

Summing up, Dr. Kuriyama and colleagues wrote, "Clinical trials are ultimately necessary to confirm the protective effect of green tea on mortality."

Action Points

Inform interested patients that in a Japanese study drinking large amounts of green tea (three to five or more cups a day) reduced all-cause and cardiovascular death rates, but not rates for cancer mortality.

Primary source: Journal of the American Medical Association

Source reference:

Kuriyama, S., et al ["Green Tea Consumption and Mortality Due to Cardiovascular Disease, Cancer, and All Causes in Japan: The Ohsaki Study"](#) *JAMA* 2006; 296 (10): 1255-1266.