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Green Tea and Cardiovascular Disease Mortality: Evidence From a Prospective Cohort Study

Green tea polyphenols have been extensively studied as cardiovascular disease (CVD) and cancer chemopreventive agents. Although substantial evidence from in vitro and animal studies indicate that green tea preparations inhibit CVD and carcinogenic processes, the possible protective role of green tea consumption against these diseases in humans remains unclear. If green tea does protect humans against CVD or cancer, it is expected that consumption of this beverage would substantially contribute to greater life expectancy, given that CVD and cancer are the two leading causes of death worldwide. To date, four studies have examined the association between green tea consumption and mortality, but their sample sizes were small and the results were inconsistent.

We therefore designed a prospective analysis to examine the association between green tea consumption and mortality from CVD, cancer and all causes, within a large population-based cohort study (the Ohsaki Study) of 40,530 persons in Miyagi prefecture, in northern Japan, where green tea is widely consumed. Within this region, 80% of the population drinks green tea, and more than half of them consume three or more cups per day.

The Ohsaki Study is a population-based, prospective cohort study initiated in 1994, of 40,530 Japanese adults, aged 40 to 79 years, without history of stroke, coronary heart disease or cancer at baseline. We followed the subjects for up to 11 years (1995-2005) for all-cause mortality and for up to seven years (1995-2001) for cause-specific mortality.

Over 11 years of follow-up, 4209 participants died and over seven years of follow-up, 892 participants died from cardiovascular disease and 1134 participants died from cancer. Green tea consumption was inversely associated with mortality from all causes and from cardiovascular disease. The inverse association with all-cause mortality was more pronounced in women compared to men ($P = 0.03$). In men, the multivariate hazard ratios (95% confidence intervals) of mortality from all causes associated with different green tea consumption frequencies were 1.00 (reference) for <1 cup/day, 0.93 (0.83-1.05) for 1-2 cups/day, 0.95 (0.85-1.06) for 3-4 cups/day, and 0.88 (0.79-0.98) for ≥ 5 cups/day, respectively (P for trend = 0.03). The corresponding figures in women were 1.00, 0.98 (0.84-1.15), 0.82 (0.70-0.95), 0.77 (0.67-0.89) (P for trend <0.0001).

The inverse association with cardiovascular disease mortality was more remarkable than that with all-cause mortality. The inverse association was also more pronounced in women ($P = 0.08$ for interaction with sex). In women, the multivariate hazard ratios (95% confidence intervals) of cardiovascular disease mortality across increasing green tea consumption categories were 1.00, 0.84 (0.63-1.12), 0.69 (0.52-0.93), and 0.69 (0.53-0.90) (P for trend = 0.004). Among the cardiovascular diseases mortality, the stronger inverse association was observed for stroke mortality. In contrast, the hazard ratios of cancer mortality were above unity in all green tea categories compared to the referent category.

This presentation will report the results of this study in detail and discuss the reason for the discrepancy between effects of green tea on CVD and on cancer deaths.