



## **Study: Daily Tea Consumption Reduces Risk of Hypertension**

Scientists at the National Cheng Kung University in Taiwan have completed what they consider to be the first study that shows a definitive association between regular tea consumption and a reduced risk of hypertension. In their study, published in a recent issue of the *Archives of Internal Medicine*, the scientists found that drinking a half-cup or more of green or oolong tea for a minimum of one year could cut a person's risk of developing hypertension by approximately 50 percent, even after taking into account factors such as differences in lifestyle and diet.

After water, tea is the most widely consumed beverage in the world. A staple of Chinese culture and cuisine for centuries, more than 350 varieties of tea are known to exist, with approximately 300 grown in China alone. Researchers estimate that certain varieties of tea can contain more than 4,000 chemical compounds. While some of them have been shown to reduce blood cholesterol levels, and may even protect the body against certain types of cancer, the vast majority of the ingredients in tea may affect the body in ways that have yet to be determined.

One area of research that has intrigued scientists for years is the apparent ability of tea to treat hypertension. In China, regular tea consumption has long been associated with reduced blood pressure, while animal studies conducted in Japan in elsewhere have shown that long-term use of green tea can lower blood pressure substantially. To date, however, comparatively few studies have examined the role of green tea in reducing blood pressure levels in humans.

To determine the effects regular tea consumption could have on reducing the incidence of hypertension, a group of scientists led by Dr. Yi-Ching Yang recruited 1,507 men and women living in Tainan, a large city in southern Taiwan. All of the participants were at least 20 years old, and had no previous history of high blood pressure. Blood pressure readings and body mass index measurements were taken by physicians and trained nurses at the start of the study as part of a screening health examination.

The subjects were divided into two groups based on reported tea consumption. Those who drank less than 120 milliliters (approximately 4 ounces) per day were labeled "non-habitual" tea drinkers. The remaining subjects, "habitual" tea drinkers, drank at least 120 milliliters of tea per day for one or more years, and were further divided based on tea intake: 120-599 milliliters per day and 600 or more milliliters per day.

Because the size of the cup used in drinking tea varies widely in Chinese culture, participants were asked to provide details about what kind of cup was used, how the tea was prepared, the amount drunk, and the frequency of drinking to calculate average daily tea consumption as accurately as possible. Participants were also asked to record what kind of tea they used (black, green or oolong), and whether milk and/or sugar were added.

In addition to tea consumption, the study participants were asked about a variety of lifestyle and dietary factors, including cigarette smoking, amount and duration of physical activity, sodium intake and types of food eaten.

## Results

Approximately 40 percent of the participants met the criteria for habitual tea consumption. An overwhelming majority (96.3 percent) drank either green or oolong tea; only 4.8 percent added milk to their tea on a regular basis.

Habitual tea drinkers tended to be male, were about two years younger than non-habitual drinkers, and had higher educational levels. Interestingly, habitual tea drinkers were also considered “more generally and centrally obese,” than non-drinkers, and “smoked more, consumed more alcohol, ate fewer vegetables, and had more frequent high sodium intake” than those who did not drink tea regularly.

Despite these findings, the investigators were surprised to find that after adjusting for all of the lifestyle factors, regular tea drinkers still had lower systolic and diastolic blood pressure levels (SBP and DBP) compared to non-tea drinkers. Those who drank larger amounts of tea for longer periods of time had the lowest blood pressure readings of any group. “The adjusted mean SBP and DBP values were lowest among the subjects who drank 600 milliliters/day or more, or those who drank for 10 years or more, compared with the other two subgroups,” the authors noted. “Although the differences in SBP and DBP were small, these could be significant on a population-wide basis.”

Perhaps most importantly, the number of people who developed hypertension over the course of the study was significantly lower among those who drank tea on a regular basis. According to the researchers:

“Compared with non-habitual tea drinkers, the risk of developing hypertension decreased by 46% for those who drank 120 to 599 milliliters/day, and was further reduced by 65% for those who drank 600 milliliters/day or more, when we adjusted using five covariates for lifestyle (total physical activity, high sodium intake, cigarette smoking, alcohol drinking and coffee consumption) and seven selected dietary factors (vegetable, fruit, unrefined grain, fish, milk, food with visible fat, and deep fried food intake) in addition to the traditional major risk factors for hypertension.”

The study authors were unable to pinpoint the element in tea that reduces blood pressure, but offered several possibilities, including:

- caffeine, which is known to reduce blood pressure, but only for short intervals;
- theanine, a component of the amino acids found in green tea and a neurotransmitter in the brain, which has been shown to reduce blood pressure in rats;
- polyphenols, which act as antioxidants and help reduce the effects of free radicals;
- extracts in green tea that may relax smooth muscle; and
- other, as-yet-undetermined compounds.

While failing to confirm which ingredient is responsible for lowering blood pressure in humans, they were able to establish a link between tea consumption and reduced risk of hypertension, using a large patient base and adjusting for a variety of dietary and lifestyle factors that could otherwise skew the results of the study. They also recommended that future long-term studies be

conducted using a randomized sample of patients to validate their findings. As the scientists noted in their conclusion:

“In this study, we noted a comprehensive link between lifestyle factors and tea consumption and improved control for potential confounders and measurement of the many characteristics of tea, including duration and amount of consumption in detail ... The possible protective effects of tea consumption on hypertension risk have been suggested by our epidemiological study, and the possible blood pressure-lowering effect and mechanism of tea extracts were supported by some animal laboratory studies. However, more evidence is needed to fortify our preliminary inference about the link between tea consumption and hypertension risk.

*Reference*

Yang YC, Lu FH, Wu JS, et al. The protective effect of habitual tea consumption on hypertension. *Archives of Internal Medicine* July 26, 2004;164:1534-1540.