Epidemiological observations suggesting an inverse correlation between tea consumption and the incidence of cardiovascular diseases have been well established [1–4]. The review by Stangl et al. gives an overview of the effects of polyphenolic compounds in tea on the function of the cardiovascular system, especially on various signal transduction pathways in cardiovascular cells [5]. The underlying mechanisms of tea polyphenols in preventing cardiovascular disease, however, are yet to be well understood.

It is widely known, but still open to question, why the incidence of coronary events (death definitely or probably due to coronary heart disease or non-fatal myocardial infarction) in Japanese is substantially lower than in Western populations [6]. In Japan, as well as in other Asian countries, tea consumption is very high, and green tea, in particular, is favored by Japanese. Green tea is made by steaming, not fermenting, freshly harvested tea leaves and therefore contains more antioxidants and vitamins than fermented teas such as oolong or black tea. The major polyphenols of green tea are catechins, which constitute about one third of green tea’s total dry weight. The major catechin is (−)-epigallocatechin-3-gallate (EGCG). The biological effects of tea polyphenols are mainly focused on the effects of EGCG, including the prevention of LDL oxidation, reduction of platelet aggregation, lipid regulation, and inhibition of proliferation and migration of smooth muscle cells [7]. Any of these factors might be promising in reducing cardiovascular diseases. Recently, in Japan, a large population-based cohort study of 40,530 subjects showed green tea consumption to be inversely associated with mortality due to cardiovascular disease [8]. In another study that enrolled 203 patients who underwent coronary angiography, the observation that green tea consumption was significantly higher in patients without coronary artery disease than in those with coronary artery disease was made [9].

The review by Stangl et al. [5] compiles existing data on the beneficial effects of tea on the cardiovascular system. These molecular effects appear to be real. However, most effects of tea polyphenols in cell culture systems are obtained with rather high doses of these compounds, doses that are not compatible with tea intake in daily life. In addition, the bioavailability of tea catechins is very low. Because tea is comprised of many different ingredients, it is unresolved whether the beneficial effects of tea are due to EGCG or tea flavins, or combinations of any of tea’s ingredients.

Evidence from both basic experiments and prospective cohort studies is accumulating, though, as of yet, data from randomized, controlled clinical trials connecting basic experimental results to epidemiological observations are lacking. The possibility that dietary tea intake reduces the risk of cardiovascular events remains open to the need for further clinical trials to clarify the effects of tea polyphenols in humans in order to recommend their use against cardiovascular diseases.

References


