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File: ■ Green Tea (*Camellia sinensis*)
■ Black Tea (*Camellia sinensis*)
■ Gynecologic Cancers

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RE: Green Tea Intake Associated with Reduced Risk for Gynecologic Cancers

Butler LM, Wu AH. Green and black tea in relation to gynecologic cancers. *Mol Nutr Food Res*. 2011 Jun;55(6):931-940.

Among gynecologic cancers (those of the ovary, endometrium, cervix, vagina, and vulva), the incidence of ovarian and endometrial cancers is highest among developed Western countries and is increasing among developing Asian countries. Cervical cancer has relatively poor survival rates in areas with the highest incidence—developing countries in Asia and South America. Although dietary factors are not thought to play major roles in the etiology of most gynecologic cancers, some observational studies have evaluated the relationship between the intake of green tea (*Camellia sinensis*), which contains polyphenols with chemopreventive properties, and ovarian and endometrial cancers. In addition, the antiviral and immunomodulating properties of green tea catechins may help protect against human papillomavirus (HPV) infection, a cause of cervical, vaginal, and vulval cancers. These authors report the results of meta-analyses on green tea and black tea intake and risk for ovarian and endometrial cancers; summarize the experimental evidence for the antiviral activities of green tea catechins; and present randomized clinical trial data evaluating the efficacy of green tea catechins in treating cervical lesions and external genital warts (EGWs).

The authors searched PubMed (from 1962 to December 2010) for English-language articles (with one exception) on human epidemiologic studies that evaluated tea intake and cancers of the ovary, endometrium, cervix, vagina, and/or vulva.

Of the gynecologic cancers, ovarian cancer has been evaluated most often for its risk relationship to tea intake. During the past three decades, at least 17 epidemiologic studies have evaluated tea and ovarian cancer risk; however, only four case-control studies (one in Australia, two in the United States, and one in China) have published results specifically for green tea intake and ovarian cancer risk. The combined odds ratios (ORs) from those four studies show a significant inverse association between green tea intake and risk for ovarian cancer (OR=0.66; 95% confidence interval [CI]: 0.54, 0.80). The authors note that the daily intake of green tea ranged from 2.7% in the United States to 37% in China in those studies.

Although a protective effect of black tea on ovarian cancer risk has been observed, the cited meta-analyses present conflicting results.

A cited meta-analysis on tea and endometrial cancer, using data from five studies conducted among Asian populations, reported a relative risk of 0.81 (95% CI: 0.71, 0.93). Though not reported, the authors presume that the study focused on green tea. In a large case-control study in China, green tea intake was inversely associated with endometrial cancer risk (OR=0.78; 95% CI: 0.64, 0.94). A separate analysis of the same data revealed statistically significant dose-dependent trends for greater amounts of tea consumed (P for trend=0.03) and greater frequency of tea intake (P for trend=0.006).

In contrast, black tea intake appears to be positively associated with risk for endometrial cancer. In studies in the United States, Canada, and Europe, the combined OR for black tea and endometrial cancer was 1.20 (95% CI: 1.05, 1.38).

Persistent HPV infection can lead to the development of invasive genital cancers as well as premalignant and nonmalignant lesions, including EGWs. The authors note the lack of published data from epidemiological studies of green tea intake and risk for cervical, vaginal, or vulval cancers. Four randomized clinical trials report positive results of treatment with green tea catechin ointment in treating premalignant cervical lesions and EGWs.

The authors cite in vitro studies demonstrating the effect of the green tea catechin, epigallocatechin-3-gallate (EGCG), on inhibiting growth and inducing apoptosis in HPV-infected cervical cells and cervical cancer cell lines. They also discuss the in vivo evidence for EGCG's antitumor immunity effect on HPV-infected tumors. Evidence suggests that green tea catechins may modulate the immune system by disrupting the proinflammatory cascade via antioxidant effects, altering cell signaling, cytokines, or proinflammatory mediators.

Overall, the authors report that in their critical review and meta-analyses of published studies from observational data, green tea intake is associated with decreases of 32% for ovarian cancer risk and 23% for endometrial cancer risk. "The lack of any prospective cohort study results on green tea intake and risk for ovarian cancer suggests a cautious interpretation of the inverse association," they caution. Both prospective and retrospective observational data supported an inverse association for green tea and endometrial cancer. Black tea, however, is positively associated with endometrial cancer risk. The strong experimental evidence for the antitumor, antiviral, and immunomodulatory effects of green tea catechins on HPV-positive cells and tumors supports an underlying mechanism for green tea and protection against genital cancers.

—Shari Henson

The American Botanical Council has chosen not to reprint the original article.