Dietary Soy Intake and Breast Cancer Risk

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Purpose/Objectives: To conduct a metasynthesis of the literature on human studies of the relationship between dietary soy intake and breast cancer risk.

Data Sources: Publications in English reporting human studies were searched with the terms *soy* and *breast cancer*, using Ovid®, PubMed, and EBSCO databases. Only human studies investigating the relationship of soy intake to breast cancer development in women published from January 1997 through June 2008 were included in the review.

Data Synthesis: A total of 364 publications were located; 18 of the studies met the inclusion criteria and 18 additional studies were located through other publications identified in the search. Because four articles reported on the same two studies, a total of 34 studies were included in the review.

Conclusions: The naturally occurring dietary intake of soy food or its components appears safe for women without breast cancer; however, the safety of high supplements of soy or its components is less certain.

Implications for Nursing: Nurses should become more knowledgeable about soy foods and supplements and include soy intake in dietary assessments. Nurses caring for women at high risk for or with a history of breast cancer should confer with dietitians on current practice recommendations. Women with health issues should avoid initiating high intake of soy dietary supplements until the possible effects are better understood.

About one in eight women born in the United States today is at risk for receiving a breast cancer diagnosis during his or her lifetime. In 2009, an estimated 192,370 women will be diagnosed with and 40,170 will die from breast cancer (National Cancer Institute [NCI], 2009). The risk for developing invasive breast cancer increases as women age, with about 66% aged 55 years or older at diagnosis (American Cancer Society [ACS], 2009). Age-related breast cancer risks, however, do not reflect an individual woman's risks, which may be greater or smaller depending on a number of factors. In addition to older age and female gender, being of Caucasian race, having inherited certain genetic mutations, having a family or personal history of breast cancer, having more dense breast tissue, having begun menstrual periods before the age of 12 years or menopause after the age of 55 years, radiation treatment to the chest area early in life, and prior treatment (mothers and daughters) with diethylstilbestrol are considered nonmodifiable risk factors. Modifiable risk factors include having not had children or having had the first pregnancy after the age of 30 years, having no history of breastfeeding, being overweight or obese, having a lack of exercise, recent use of birth control pills, postmenopausal hormone therapy, and alcohol use (ACS). The pressing need to discover some means to decrease the risk of breast cancer development has led scientists to examine soy foods as possible prevention strategies.

Soy Isoflavones, Sources, and Effects

Soy Isoflavones

Soybeans, also referred to as soy or soya, are plants of Asian originthat produce beans used in a variety of food products (Biology Online, 2005). Soybeans and soy products are a major source of phytoestrogen, an estrogen-like substance (MedlinePlus, 2008) also referred to as plant estrogen. Isoflavones, one class of phytoestrogens, are structurally similar to mammalian estrogens, have estrogenic properties, and are potential anticarcinogens (Peeters, Keinan-Boker, van der Schouw, & Grobbee, 2003). Isoflavones also are considered a subclass of flavonoids, a large family of compounds synthesized by plants and thought to have potential antioxidant properties (Linus Pauling Institute, 2008). Antioxidants are substances that protect cells from damage caused by free radicals produced by oxidation during normal metabolism, thought to play a role in cancer development (NCI, 2004). The most common dietary isoflavones are genistein, daidzein, and glycitein (Linus Pauling Institute), sometimes also referred to as isoflavonoids (Kelly, Nelson, Waring, Joannou, & Reeder, 1993). The major metabolite of daidzein is equol, a nonsteroidal estrogen produced in the intestines (Medicinenet.com, 2004). Only about 33% of the population from Western cultures are capable of producing equol based on the findings of urinary excretion studies (Setchell, Brown, & Lydeking-Olsen, 2002). Because equol has greater estrogenic activity than daidzein or other metabolites, differences