



Estrogen Metabolism Linked To Cancer

It's not just what you have, but how your body uses it

Scientists are gaining new insight into how we might better prevent cancers that depend on estrogen for their primary "fuel." And the key may lie in evaluating how the body breaks down estrogen.

Estradiol is the most powerful form of estrogen in the body. Higher levels of this hormone may cause cells in certain tissues to multiply faster (i.e., proliferate), possibly fueling the growth and spread of tumors. But high estradiol is just part of the picture. How the hormone is metabolized in the body may play a crucial role in determining its effect on cell proliferation.

Risk appears to be much greater when estradiol is converted into an active, potent metabolite called 16alpha-hydroxyestrone (16a-OHE1), as opposed to the weaker, anti-estrogenic 2-hydroxyestrone (2-OHE1). 16a-OHE1 binds strongly to special receptors inside cells that control the rate of DNA synthesis and cell multiplication.

Several studies have found a low ratio of 2-OHE1 to 16a-OHE1 associated with breast and cervical cancers. A new study extends these findings, by implicating the dysregulation of estrogen metabolism in cancers of the head and neck as well.

Comparing estrogen metabolism in two groups of patients, researchers found that 30% of patients with head and neck cancer had low 2-OHE1/16a-OHE1 ratios, compared to just 4% of the healthy controls.

"...We have demonstrated for the first time, that head and neck cancer patients metabolize estrogen differently than healthy matched controls," they reported.

While the cancer itself could dysregulate estrogen metabolism, researchers pointed out that there are also genetic factors that could trigger imbalances before cancer develops. For example, women with a certain genetic make-up (Cyp 1A1 polymorphism) could be more vulnerable to enzyme imbalances that promote the breakdown of estradiol into its more bioactive form, 16a-OHE1, thus increasing cancer risk.

Several interventions can shift metabolism toward the much less potent 2-OHE1 and away from the 16a-OHE1 form. These include a low-fat diet, exercise, and indole-3-carbinol (I3C), a chemical found naturally in certain cruciferous vegetables (like broccoli, Brussels sprouts, and cauliflower).

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These are just some ways to potentially reduce cancer risk by modifying estrogen metabolism. "The ability to alter estrogen metabolic pathways through chemoprevention may diminish cancer risk at multiple sites including the aerodigestive tract," the researchers emphasized.

NOTE: The Women's Hormonal Health Assessment is a convenient one-day, single sample serum assessment that allows an in-depth evaluation of sex hormone metabolism in pre- and post-menopausal women and monitoring of responses to dietary, lifestyle, and other preventive interventions. This profile incorporates innovative, new assays to measure hydroxyestrone metabolites in serum - all fully validated. In addition to 2-OHE1, 16a-OHE1, and their ratio, this profile includes estradiol, estrone, estriol, testosterone, progesterone, DHEA-S, sex-hormone-binding globulin, and other clinically significant ratios.

Source: Yoo HJ, Sepkovic DW, Bradlow HL, Yu GP, Sirilian HV, Schantz SP. Estrogen metabolism as a risk factor for head and neck cancer. Otolaryngology Head Neck Surg 2001; 124: 241-7.

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