Estrogen Metabolism and Breast Cancer Risk among Postmenopausal Women

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Abstract

Endogenous estrogens have been implicated with an increase in hormone-related cancers such as cancers of the breast and endometrium; however, the role of estrogen metabolism remains less clear. Earlier research suggested that the ratio of two estrogen metabolites, 2-hydroxyestrone (2-OHE1) and 16α-hydroxyestrone (16α-OHE1), may serve as a useful biomarker of breast cancer risk yet this hypothesis was not largely supported by the few epidemiological studies of breast cancer that evaluated these metabolites. These prior studies, however, captured only a portion of the estrogen profile and were also restricted by the limitations of commercial immunoassays. A liquid-chromatography-tandem mass spectrometry assay developed at the NCI Frederick National Laboratory quantifies 15 estrogens and estrogen metabolites simultaneously, providing an opportunity to comprehensively assess endogenous estrogen and estrogen metabolite exposures with improved reproducibility, sensitivity and specificity. Three prospective studies of postmenopausal breast cancer risk have since utilized this assay. Findings from the recent analysis of circulating estrogen metabolites and breast cancer risk in the B~FIT cohort (Breast and Bone Follow-up to the Fracture Intervention Trial) will be discussed.

Keywords: Estrogen metabolism, Postmenopausal, Cancer risk.

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