

Environmental Estrogens and Breast Cancer

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Background: Recent studies revealed that various man-made chemicals with endocrine-disrupting properties contribute in the development of breast cancer.

Objective: To review the state of the science of the endocrine-disrupting chemicals (EDC) and their role in the development of breast cancer.

Methods: Key papers on experimental and epidemiologic studies examining the associations between EDC and breast cancer were searched through the Google Scholar and PubMed using keywords "EDC", "xenoestrogens", and "breast cancer".

Results: EDC effects depend on the level and timing of exposure, with critical window on developmental stages. Diethylstilbestrol (DES) and bisphenol A (BPA) are two thoroughly studied environmental estrogenic compounds. Epidemiological studies showed increased breast cancer incident in women exposed to DES during gestation. Experimental studies revealed that BPA induces architectural and gene expression profile changes in rodent mammary gland, with the stroma of fetal mammary gland as the primary target. The effects of these environmental estrogens are mostly mediated through the estrogen receptors α and β . Their exposure may further sensitize the mammary tissue to the hit of other carcinogens. Epigenome alteration in the mammary gland has also been implicated in its neoplastic development.

Conclusions: Fetal and perinatal stages are the critical exposure windows to environmental estrogens and multiple mechanism is implicated in the development of breast cancer resulted from this exposure.