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for Cancer Research**Control/Tracking Number :** 04-AB-4311-AACR**Activity :** Abstract Submission**Current Date/Time :** 11/14/2003 11:15:18 AM**The Effect of Iodine Replacement on Lactoperoxidase in Mammary Gland Dysplasia**

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Introduction. An iodine pathway has been described for the mammary glands (MG) and has a major effect on secretory and anatomical changes. This pathway is most evident during gestation, lactation and neoplasia, and is present, but less prominent in inactive MG. In neoplastic breast tissues, peroxidase activity (PA) is inversely related to estrogen receptor alpha (ER) concentration and tumor size in induced rat mammary carcinomas. In the iodine pathway of MG, PA may restrict estrogen action. Thus, iodine deficiency of the breast may reduce peroxidase protection by increasing ER concentrations.

Objective. The present study is designed to measure PA in iodine deficient (ID) and ID+ iodine- or iodide-treated rats given estrogen supplementation. The program includes replacement with iodine and iodide as well as tamoxifen therapy as a control.

Method. Sixteen SD female rats were divided into four groups for a short-term (21-day) study. Perchlorate-treated water was given for four days, estrogen injected every other day with an ID diet continuously. Breast tissues were analyzed for PA, and evaluated histologically. Additionally, thyroid glands and ovaries were removed for histology and weight; vaginal smears and venous blood were monitored for estrogen level.

Results. ID causes a reduction in peroxidase activity, and iodide replacement significantly increases peroxidase action (24%)($p < 0.01$). The tamoxifen control is unchanged ($p = NS$). Iodine causes some minimal changes in the peroxidase with the same treatment ($p < 0.02$). Histology showed moderate fibrocystic changes (FC) in the ID breasts, but were reduced in iodine- and iodide-treated rats.

Tamoxifen, likewise, showed an initial short-term reduction in benign FC.

Conclusions. This preliminary study indicates again that iodine deficiency results in FC or dysplastic changes in MG. Peroxidase levels are reduced in iodine deficiency which appears to be responsible for enhanced ER activity. Iodine replacement requires less peroxidase than iodide to promote the oxidation for the formation of iodoprotein. The antiestrogen, tamoxifen, acts directly on estrogen metabolism. Thus, this preliminary study proposes how iodine metabolism is associated with estrogen activity that results in dysplasia and neoplasia in the MG.

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