

20: Postpartum breast involution reveals regression of secretory lobules mediated by tissue-remodeling

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Scientists have long been interested in the changes in the breast during pregnancy, breast feeding and weaning, and how these affect breast cancer risk. They already know that about 35 percent breast cancer cases in younger women are negatively affected by a recent pregnancy.

The changes in the postpartum breast are dramatic as the body shifts back to pre-pregnancy conditions. The mammary glands undergo programmed cell death (apoptosis) and tissue remodeling when those glands are no longer needed for breast feeding. For most women, this takes about 12 to 18 months after weaning.

This “involution” is normal and natural. However, in some women, this process sets up conditions that enable cancer cells to evolve and grow. Women who develop breast cancer during this postpartum involution have poorer outcomes than women from other demographics.

Methods:

For this study, researchers wanted to see if changes they had observed in postpartum mice were similar to those of postpartum women. Specifically, they wanted to study postpartum involution in the lobular tissue of the breast.

They used normal breast tissue samples from clinical biopsies of 151 premenopausal women, aged 20 to 45 years, grouped into several categories: those who had never been pregnant, those pregnant and those lactating, and by time since last delivery. They examined four types of lobules common in each of those categories to see what changes occurred and when, to pinpoint where in the process cancer could develop.

Findings:

One strength of this study is that it examined tissue from women who had never been pregnant, which gave researchers a baseline to compare changes in breast tissue during and after pregnancy and breast feeding.

They found several conditions during the involution time frame that may contribute to rise of cancer cells. For example, inflammation, natural cell death and wound-healing-like processes are conditions that could trigger an environment for cancer cells to develop.

Why this study is important:

The findings of this study identify a concrete window of time when the breast is completely remodeling, a time when some cellular changes also could set the stage for development of breast cancer. More research could lead to methods to identify and prevent those potentially dangerous changes.