

ARTICLES

Breast Carcinogenesis—Can the Examination of Ductal Fluid Enhance Our Understanding?

Kimberly Baltzell, RN, PhD(c), Suzanne E. Eder, NP, RN,
and Margaret Wensch, MPH, PhD

Purpose/Objectives: To explore current breast carcinogenesis theories and the possibility of examining breast epithelial cells to confirm steps in the carcinogenic process and the relationship between intraductal sampling techniques and their role in enhanced risk prediction.

Data Sources: Published articles, textbooks, and conference proceedings.

Data Synthesis: Examining breast epithelial cells may provide insight into the carcinogenic process while it is occurring. Methods of extracting breast epithelial cells include nipple aspiration, ductal lavage, and periareolar fine-needle aspiration.

Conclusions: Nipple aspiration, ductal lavage, and periareolar fine-needle aspiration are viable means of examining possible precursors to breast tumors. Differentiating between true precursors and benign changes is an important step in breast cancer risk assessment.

Implications for Nursing: Nipple aspiration and ductal lavage may be performed in an outpatient setting. RNs and advanced practice nurses may perform these procedures and discuss results with patients.

An understanding of normal cellular transformation to malignancy is not defined clearly in the study of breast cancer. Deciphering the breast cancer pathophysiology pathway is necessary for the design of effective cancer prevention strategies (Miller, Bates, & Nabell, 2002). Recent studies showing a significant association between proliferative breast cells and increased risk of breast cancer development highlight the importance of clarifying precursors to disease development (Fabian & Kimler, 2001; Wensch et al., 2001). Studzinski and Harrison (2002) wrote that precise breast cancer diagnosis, monitoring, and treatment require understanding the control of cell growth, which may lead to the ultimate goal—prevention. Studying the progression from normal cell growth patterns to malignancy has been difficult because of the populations on whom most research has been performed. These populations typically include patients with advanced or metastatic disease. These studies may be limited in their usefulness because events surrounding carcinogenesis already have taken place (Briand & Lykkesfeldt, 2001). Researchers generally agree that carcinogenesis is a result of a combination of inherited susceptibility (germline mutations)

Key Points . . .

- ▶ Many breast carcinogenic theories support the notion of a cellular continuum from normal epithelium through multiple proliferative stages to malignancy.
- ▶ Examining breast epithelial cells over time to determine when premalignant changes occur may lead to enhanced risk prediction.
- ▶ Obtaining breast epithelial cells via nipple aspiration, ductal lavage, or periareolar fine-needle aspiration may be a less invasive way to acquire information on breast cancer risk than currently achieved by breast biopsy.

and acquired genetic changes (somatic mutations), possibly involving more than 200 genes (Miller et al.; Studzinski & Harrison). This article will discuss the current theories of breast carcinogenesis, emphasizing the progression of normal cells through malignant transformation. Carcinogenesis theory lends support to the idea of using breast epithelial cells to analyze possible precursors to malignancy, leading to enhanced breast cancer risk-prediction models. Types of intraductal sampling techniques will be reviewed, as well as the correlation between tissue cytology and intraductal cytology.

Kimberly Baltzell, RN, PhD(c), is a doctoral candidate in the Department of Physiologic Nursing at the University of California, San Francisco (UCSF), Suzanne E. Eder, NP, RN, is a nurse practitioner at the UCSF Breast Care Center, and Margaret Wensch, MPH, PhD, is a professor in the Departments of Neurological Surgery and Epidemiology/Biostatistics at UCSF. (Submitted December 2003. Accepted for publication September 3, 2004.) (Mention of specific products and opinions related to those products do not indicate or imply endorsement by the Oncology Nursing Forum or the Oncology Nursing Society.)

Digital Object Identifier: 10.1188/05.ONF.33-39