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Meeting abstract

The importance of MUC1 and cyclin B1 antibodies in nipple aspiration fluid (NAF): preliminary results

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MUC1 glycoprotein is produced by normal breast epithelial cells and cyclin B1 is involved in the transition from G2-to-M phase of the normal cell cycle. In cancer cells, including breast cancer, MUC1 and cyclin B1 are overexpressed and aberrantly expressed leading to their recognition by the immune system and production of specific antibodies detected in the serum of cancer patients. Because MUC1 and cyclin B1 are expected to be deregulated early in disease, we hypothesized that monitoring these antibody responses may be of diagnostic or prognostic value in breast cancer (BC). Furthermore, we wanted to test if NAF can be an alternative source of these antibodies.

Objective/hypothesis

The hypothesis is that NAF would contain anti MUC1 and anti-cyclin B1 antibodies in patients with BC and premalignant lesions in comparison with healthy women.

Aim

The aim of this project was to test NAF for the presence of anti-MUC1 and anti cyclin B1 antibody in patients with BC, premalignant lesions and healthy women.

Materials and methods

We collected the pretreatment NAF of patients with BC, non invasie tumor, premalignant lesions (atypical ductal-, and lobular hyperplasia), and also healthy women. Anti MUC1 and anti cyclin B1 antibody levels were measured by an enzyme linked immunosorbent assay (ELISA). NAF samples were taken from breasts with disease and the contralateral healthy breast, and breasts of healthy women operated upon for benign breast diseases. The mean level of the antibody levels of patients and healthy controls in NAF were compared by a t-test. The discrimination of the antibody levels of patients and healthy controls in NAF were assessed by calculating the area under (AUC) the receiver operating characteristic curve (ROC).

Results

A total 82 NAF samples from 50 patients were collected; 35 NAF samples were collected from breasts with invasive cancer, 12 samples with ADH and ALH, 5 samples with DCIS and LCIS, 2 samples with benign lesions and 28 samples from healthy breasts. There were no statistically significant difference between the invasive tumor, high-risk lesion and control groups, but AUC under the ROC was 0.78 and 0.69 in anti MUC1 and anti Cyclin B1 IgM groups between non-invasive tumor group and controls; it is generally accepted that AUC values 0.7–0.8 represent good discrimination.

Conclusion

This is the first study investigating anti-MUC1 and anti cyclin B1 antibodies in NAF of BC patients. Even though the sample size is still small and additional samples are being accumulated, finding the tumor specific IgM in the NAF of the non invasive patients is encouraging. Development of more sensitive techniques for antibody detection may allow detection of low antibody levels in the non

invasive tumor and premalignant lesions and boost the usefulness of NAF as the source for this diagnostic assay. Combining NAF biomarkers with clinical parameters such as breast density and scoring systems for the clinical judgment of breast tumors may be clarified by future studies.