https://doi.org/10.29289/259453942021V31S2101

GENETIC EVALUATION OF MICROCALCIFICATIONS AS A PROGNOSTIC FACTOR

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Introduction: Breast cancer is the most recurring type of cancer among women, with reduced mortality at an initial stage of lesion. From a radiological perspective, perceived microcalcifications may be associated with histological findings such as proliferative injuries with or without atypical features and ductal carcinoma in situ. Currently, percutaneous and vacuum biopsies allow for the correlation between anatomoradiological and identification of previous lesions and those that offer the risk of cancer. No biomarker has been established to predict the risk of cancer in women diagnosed with benign mammary disease. Doing so could strengthen the possibility of stratifying the individual risk of benign injuries for cancer. The platelet-derived growth factor receptor A (PDGFRA) plays its part in tumor oncogenesis, angiogenesis, and metastasis, and its activation is found in some kinds of cancer. In contrast, DNA methylation standards are initial changes to the development of cancer and may be helpful in its early identification, being regulated by a family of enzymes called DNMTs (DNA methyltransferase). **Methods**: The aim of this study was to evaluate the profile of BI-RADS® 4 and 5 mammary microcalcification women carriers and determine the level of the gene expression of possible molecular markers in 37 patients with mammary microcalcification (paraffin blocks) and 26 patients with breast cancer (fresh in RNA later tissue) cared for at the Hospital Barão de Lucena's Mastology Ambulatory. Anatomoradiological aspects along with clinical findings have been evaluated , and percentage rates have been calculated. The PDGFRA and DNMTs (DMNT3a) gene expressions have been established using quantitative polymerase chain reaction (qPCR), with the use of β-actin as reference gene. **Discussion**: In the patients with mammary microcalcification, the average age was 55.9; predominantly white-skinned subjects ($p<0.014$). Most of them were mothers ($p<0.001$) and breastfeeding ($p<0.001$), and the average menarche age was 13. The subgroups that presented greater significance were patients classified BI-RADS® in category IV (67.6%) and histological findings of nonproliferative lesion ($p<0.001$). Lesions of the ductal carcinoma in situ type (100%) presented positive estrogen and progesterone receptors, and 94.6% have undergone sectorectomy surgery by prior needling ($p<0.001$). The most damaged breast was the left one (62.2%), and the most affected quadrant was the top lateral one (59.5%) ($p<0.001$). There was no family history in 83.8% of the cases. In the tested microcalcification samples, it was not possible to observe the expression of PDGFRA. Nevertheless, 15 out of 37 patients with microcalcification showed an increase in the gene expression of DMNT3a, most of them greater than Luminal and triple-negative cancer types. **Conclusion**: The data presented here highlight the improvement on the description of BI-RADS® 4 subclassification in order to better conduct the clinical decision and also demonstrated the potential of DNMTs evaluation in microcalcification samples as a strategy to access the understanding about the role of these molecules in the breast cancer development.

Keywords: Benign Mammary Disease; Biological Risk Factors; Mammary Neoplastic; Mammography; Gene Expression.