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CLINICAL AND MOLECULAR EVALUATION OF MICROCALCIFICATIONS CLASSIFIED AS BIRADS® 4 AND 5

Darley de Lima Ferreira Filho¹, Nancy Cistina Ferraz de Lucena Ferreira¹, Thais de Lucena Ferreira²¹Hospital Barão de Lucena – Recife (PE), Brazil.²Faculdade Pernambucana de Saúde – FPS – Recife (PE), Brazil.

Breast cancer is the most recurring type of cancer amongst 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 cancer in women diagnosed with benign mammary disease, and identifying it 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. On the other hand, 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 methyl transferase). 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 RNAlater tissue) cared for at the Hospital Barão de Lucena's Mastology Ambulatory. Anatomoradiological aspects have been evaluated together with clinical findings, and percentage rates have been calculated. The PDGFRA and DNMTs (DNMT3a) gene expressions have been established by means of quantitative PCR (qPCR), with the use of actin as reference gene. Among the patients with mammary microcalcification, the average age was 55.9; predominantly white-skinned subjects, ($p < 0.014$). Most of them were mothers ($p < 0.001$), 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 non-proliferative 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 of 37 patients with microcalcification showed increase in the gene expression of DNMT3a, most of them greater than Luminal and Triple Negative cancer types. The data presented here highlights the improvement on the description of BI-RADS 4 sub-classification in order to better conduct the clinical decision. Data 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.