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DUAL TIME FDG PET/CT IN PRONE POSITION AND METABOLIC CORRELATION WITH MOLECULAR SUBTYPES AND PROGNOSTIC FACTORS IN BREAST CANCER

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BACKGROUND-AIM

To evaluate if metabolic information with FDG PET/CT is correlated with molecular phenotypes and biologic prognostic features in breast cancer patients.

METHODS

A prospective study involved 80 women with newly diagnosed breast cancer (cT2- cT3) who performed FDG PET/CT for initial staging. A standard whole body PET/CT scan was acquired (PET1) followed by a delayed prone acquisition of the thorax with a dedicate breast device 2 hours post-injection (PET2). The results were evaluated qualitatively and semiquantitatively in all lesions with SUVmax, respectively SUV1 in PET1 and SUV2 in PET2, the percentage variation between SUV values (⊗SUV) was calculated. Hormone receptor status, HER-2 expression and biological prognostic parameters were obtained from primary tumor tissue. Tumor subtypes were classified according to the recommendations of the 12th International Breast Conference by immunohistochemical surrogates as Luminal A (n. 26), Luminal B-HER2 neg (n. 32), Luminal B-HER2 pos (n.10), HER2 pos (n. 6) and Basal Like (n. 6). Statistical analysis of variance (ANOVA), kappa and paired t tests were used to compare variables.

RESULTS

SUV values were lower in LA and LB-HER2 neg (t test < 0,0001), in these phenotypes we mainly registered negative ⊗SUVs (in 14/15 tumors). Significant statistical differences were noticed between metabolic information (SUV 1, SUV2) and grading (P=0,0039), ki-67 (P=0,0439) and molecular subtypes (P=0,0069) but there was not high correlation between ⊗SUV, ki-67 and grading (respectively P= 0.1207 and P= 0.7536).

CONCLUSION

FDG uptake and ⊗SUV are influenced by biological tumor features. There are subgroups of invasive breast lesions, mainly Luminal A subtype, characterized by low glycolytic metabolism and a decrease uptake over time, which could be misinterpreted as benign lesions. The knowledge of all these factors is important for a better interpretation of metabolic results.