Breast cancer aggressiveness, miRNA and choline

ABSTRACT

The level of choline kinase in human breast cancer cells was found to be overexpress as compared to normal human mammary epithelial cells. This book presents a study that we investigated the potential expression of choline in 18F-FCH PET/CT as compared to F18Fluorodeoxyglucose PET/CT and correlations with expression of miRNA, CD47 and histo-immunochemical markers of estrogen, progesterone and HER2 in detecting aggressiveness of breast cancer. Twenty one patients with Birads 4 or 5 on mammogram and recurrent breast carcinoma underwent imaging of 18F-Fluorocholine and 18FFluorodeoxyglucose PET/CT. Tissue biopsy and histo-immunochemical results with blood sampling of expression of miRNA-21,miRNA-155 and CD47 were recorded. The data were evaluated by experienced nuclear imaging using the biopsy and histo-immunochemical findings as a gold standard. There were 21 females with a mean age of 52.82 ± 10.71 years. There is a significant evidence of high uptake of 18F-Fluorocholine PET/CT in the metastatic lesions (2.27±3.19) as compare to 18F-Fluorodeoxyglucose (1.74±2.32, p=0.004). While there is a significant association between high 18F-Fluorocholine uptake (3.53±3.51,p=0.005) with HER2-ve (1.98±2.14, p=0.009) in metastatic lesions and lymph node. High uptake of 18F-Fluorocholine showed a significant correlation with expression of miRNA-21 in lymph node (1.81±2.21,p=0.05) and metastasis lesions (3.33±3.61,p=0.02). There is also a significant correlation between high choline uptake with expression of miRNA-155 (1.47±1.99,p=0.01) and CD47 (0.85±0.23,p=0.008) in lymph node and 18F-Fluorocholine showed high sensitivity and specificity (40%,68.8%) compared to 18F-Fluorodeoxyglucose (27.3%,60%). There is a significant association miRNA-155 between patients with recurrent breast cancer and non-recurrent breast cancer (p=0.026) and expression of HER2 –ve (p=0.042).We concluded that higher choline uptake in 18F-Fluorocholine would potentially be used as novel surrogate marker for detection and prediction of an aggressive breast cancer with strong correlation with the protein overexpression of miRNA-155, miRNA-21,CD47 and HER2-ve.