Clinical Implications of 18F-FES PET/CT in ER+ Breast Cancer: A Retrospective Analysis of Institutional Use, Staging Treatment Decisions, and Diagnostic Performance

Introduction: Breast cancer treatment relies heavily on biomarker expression profiles, especially estrogen receptors (ER). While immunohistochemical (IHC) staining of tissue biopsies remains the gold standard for ER evaluation, 18F-fluoro-17β-estradiol positron emission tomography (FES PET/CT) is a non-invasive imaging alternative that can assess ER-positive breast cancer. This study sought to assess the real-world clinical utility of FES PET/CT in a rural Appalachian region, including its diagnostic performance, impact on staging and treatment decisions.

Methods: A retrospective chart review was conducted on 68 patients with ER-positive breast cancer who underwent FES PET/CT at a tertiary referral cancer center between February 2023 and February 2024. Patient demographics, tumor characteristics, treatment history, and outcomes were collected. Changes in staging, treatment plans, and correlations between FES PET/CT SUV values and ER expression were assessed.

Results: FES PET/CT detected ER-positive disease in 73.6% of patients, including two cases missed by initial biopsy. Scans resulted in upstaging in 37.2% of patients, prompting treatment changes in 50%. These changes included treatment escalation, de-escalation, and initiation of new adjuvant, maintenance, palliative, or neoadjuvant therapies. The median time to change in therapy after FES PET/CT was 12 days.

Discussion: The study demonstrated FES PET/CT's clinical utility in identifying ER-positive disease, sometimes missed by traditional methods. It aided in upstaging and significantly impacted treatment decisions, potentially improving outcomes. A notable discordance was observed between primary and metastatic lesions in terms of ER and PR status, highlighting the importance of comprehensive metastatic evaluation.

FES PET/CT played a pivotal role in confirming ER-positive metastases, assessing disease progression, and avoiding unnecessary biopsies. It offers a non-invasive way to assess ER status, particularly in cases where biopsies are challenging or risky. This study further supports FES PET/CT's role in the management of advanced or metastatic breast cancer, aligning with current guidelines.

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