Incidence and clinical significance of focal breast uptake at 18F-FDG PET-CT in patients without known breast cancer

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INTRODUCTION

18-Fluorine fluorodeoxyglucose (FDG) PET-CT is a sensitive technique which is firmly established in the management of a range of tumours. Hypermetabolic foci unrelated to the primary malignancy are not infrequently encountered. The aim of this study was to evaluate the clinical significance of unexpected focal FDG uptake within the breast in patients undergoing PET-CT for assessment of other malignancies.

METHODS

Consecutive adult patients undergoing FDG PET-CT for assessment of a non-breast primary cancer between February 2009 and October 2012 at a single tertiary referral centre were retrospectively reviewed.

The incidence of focal FDG uptake within the breast was determined.

PET parameters including maximum standardized uptake value (SUVmax), metabolic tumour volume (MTV), and total lesion glycolysis (TLG) were recorded for each patient.

The presence and patterns of morphologic changes on CT were assessed.

Aetiology and clinical significance were confirmed histologically or by imaging and clinical follow-up.

RESULTS

<table>
<thead>
<tr>
<th>Benign breast lesion</th>
<th>Metastatic disease from non-breast primary</th>
<th>Primary breast cancer</th>
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</thead>
<tbody>
<tr>
<td>Mean Age (range)</td>
<td>54.2 (54-72)</td>
<td>57.5 (32-80)</td>
</tr>
<tr>
<td>Mean SUVmax (range)</td>
<td>3.5 (1.5-6.4)</td>
<td>4.2 (2.6-6.9)</td>
</tr>
<tr>
<td>Deaths</td>
<td>2</td>
<td>4</td>
</tr>
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</table>

Table 1: Characteristics of different FDG positive breast lesions

- 23 of 8972 patients (0.25%) had unexpected focal FDG uptake in the breast.
- 20 patients (86%) underwent biopsy, malignancy was confirmed in 16 patients (70%), 4 (17%) had disseminated disease from their primary cancer and 12 (52%) had an unsuspected synchronous breast cancer.
- 5 (23%) patients had histologically confirmed benign lesions.
- 8 patients (67%) with newly diagnosed breast cancer were out of the breast screening programme (≥47≥73 years).
- Only 5 patients (42%) had a breast lesion with a SUVmax > 4 and no PET parameters reliably distinguished benign from malignant pathology.

CONCLUSIONS

- Incidental focal FDG uptake in the breast is rare but requires further evaluation as approximately 50% of cases represent incidental synchronous breast carcinoma.
- In this series synchronous breast cancer was associated with a worse prognosis and was more common in older women.
- No PET parameters reliably distinguish benign from malignant pathology.