Background

- Background parenchymal enhancement (BPE) describes normal breast tissue uptake of intravenous contrast on breast MRI.
- BPE as an imaging biomarker may predict pathologic complete response (pCR) to neoadjuvant chemotherapy in patients with HER2+ disease. BPE can provide additive prediction to MRI-measured functional tumor volume (FTV) models.

Methods

- Subjects were identified who initially enrolled in the I-SPY 2 drug arms (all HER2+ cancers) using a prospective protocol (Figure 1).
- Inclusion criteria: Tumor Size ≥ 2.5 cm; hormone-receptor (HR)+/HER2- Mammogram (MP) high risk, HR-HER2+ patients. HER2- patients were not included in this substudy.

Results

- A total of 352 MRIs in 88 women (29-pCR, 59 non-pCR) were identified.
- Women with pCR were more often HR+ than non-pCR (24% vs. 61%).
- Women who achieved pCR tended to have higher absolute BPE values, at baseline, which decreased more at later time points treatment (Fig 4).

Table 2: Prespecified multivariate analyses of FTV/BE predictors

<table>
<thead>
<tr>
<th>Predictor</th>
<th>pCR vs NON-pCR OR (95% CI)</th>
<th>pCR vs NON-pCR OR (95% CI)</th>
<th>pCR vs NON-pCR OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTV0_1</td>
<td>0.89 (0.67-1.15)</td>
<td>0.94 (0.73-1.21)</td>
<td>0.91 (0.74-1.10)</td>
</tr>
<tr>
<td>FTV0_2</td>
<td>1.00 (0.84-1.19)</td>
<td>0.99 (0.83-1.17)</td>
<td>1.00 (0.87-1.13)</td>
</tr>
<tr>
<td>FTV0_3</td>
<td>1.00 (0.84-1.19)</td>
<td>0.99 (0.83-1.17)</td>
<td>1.00 (0.87-1.13)</td>
</tr>
</tbody>
</table>

Please note: For full table, please see the supplementary material.

Conclusions

- Quantitative whole breast BPE of the contratular breast decreases with neoadjuvant chemotherapy.
- BPE-HER2- does not show significant improvement in diagnostic performance when added to a multivariate predictor tumor volume model, although further study is warranted.

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