

The Utility of Magnetic Resonance Imaging (MRI) in predicting response of lymph nodes in HER2 positive (HER2+) and Triple Negative Breast Cancer (TNBC) to Combination Neoadjuvant Immunotherapy and Chemotherapy (NAICT) and its implications on Axillary Surgical Management.

Noeline Rajarajan, MBBS, Robert Weinfurtner, MD, Adrian Lopez, MD, John Kiluk, MD, M. Catherine Lee, MD, Brian Czerniecki, PhD, MD, Nazanin Khakpour, MD.

Department of Breast Oncology, H. Lee. Moffitt Cancer Center and Research Institute. Tampa, FL

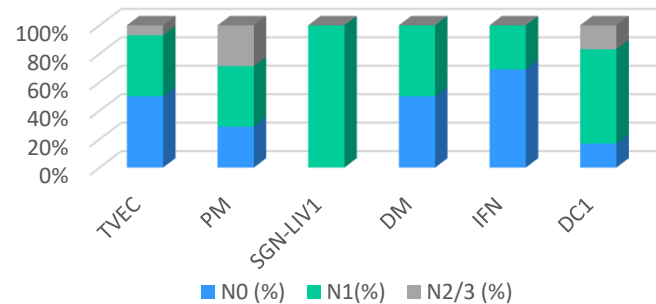
Introduction

Immunotherapy is increasingly used in combination with chemotherapy (NAICT) in the neoadjuvant setting for the treatment of certain breast cancers with a goal of increasing pathological complete response (pCR). The aim of this study was to evaluate the ability of Magnetic Resonance Imaging (MRI) to detect pathological complete response (pCR) of the axilla (Ax) among patients (pts) treated with NAICT and assess its implications on axillary surgical management.

Results

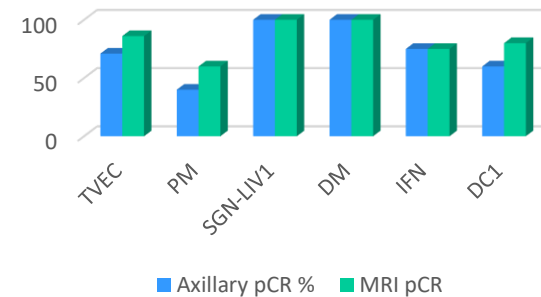
IT Regimen	TVEC	PM	SGN-LIV	DM	IFN	DC1
CT Regimen	TddAC	TddAC	ddAC	TddAC	THP	TCHP
Number of Pts	14	7	1	2	13	6
% Pts +ve FNA	50	71	100	100	31	83

Nodal status across the IT Protocols



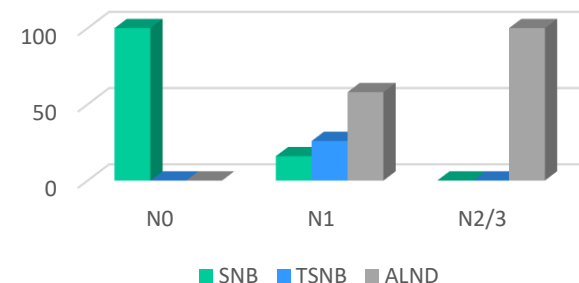
Clinical Nodal Status	Number of Pts	pCR of Ax	MRI pCR Ax	MRI Accuracy
N0	20 (47%)	N/A	N/A	95%
N1	19 (44%)	13 (68%)	16 (84%)	74%
N2/3	4 (9%)	2 (50%)	2 (50%)	100%

Axillary pCR compared to pCR on MRI



MRI detection of pCR in Patients with Nodal Dx	
Sensitivity	93%
Specificity	50%
PPV	78%
NPV	83%
Accuracy	78%

Final Axillary Surgery performed according to Nodal Status



Discussion

The type of axillary surgery performed after neoadjuvant chemotherapy continues to be a topic of much debate. Some surgeons use post treatment MRI to aid in this decision making. This study reveals that the sensitivity of MRI to detect pCR of the axilla in patients with nodal disease treated with NAICT is high at 93% with an accuracy of 78%. Specificity however is low, with false positive patients often found to have either micro metastatic disease or a single positive lymph node. Improvement in accuracy was seen in patients with higher nodal tumor burden.

Conclusion

- NAICT does not interfere with the accuracy of MRI in assessment of node negative disease.
- The accuracy of MRI increases with greater nodal burden.
- In N2/N3 disease MRI may be useful in discriminating pts who can undergo a selective Targeted Sentinel Node Biopsy (TSNB) versus those who require a formal Axillary Lymph Node Dissection (ALND).



Methods

We retrospectively reviewed the clinicopathological data of 43 women with HER2+ and TNBC treated at a single institution who had undergone definitive surgery after IRB approved protocols of NAICT.

- Intratumoral Talimogene Laherparepvec (TVEC) with weekly Paclitaxel (T) -> Adriamycin and Cytoxan (ddAC);
- Subcutaneous Interferon Gamma (IFN) injections with weekly T and Trastuzumab and Pertuzumab (HP)
- HER2 pulsed dendritic cell vaccines (DC1) pulsed for 3 weeks -> Taxotere, Carboplatin, and HP
- Pembrolizumab (PMB) with weekly T-> ddAC
- SGN- LIV1A -> ddAC
- Durvalumab (DM) and Olaparib with T -> ddAC.