Comparison between the LRP model and Adjuvant!© Online in predicting 9-year distant disease-free survival

Mao Ding, MD[1]; Hong Zhang, MD[2]; Qian Wu, MD[3]; Hongyu Xiang, MD[1]; Yuanjia Cheng, MD[1]; Ling Xu, MD[1]

[1]Thyroid and Breast Surgery, Peking University First Hospital, Beijing, China; [2]National Cancer Center/National Clinical Research Center for Cancer/Cancer Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing, China; [3]Department of Interventional Medicine, China-Japan Friendship Hospital, Beijing, China

Introduction

- Breast cancer (BC) subtype can be determined based on quantitative detection of the mRNA level of the four genes *ESR1*, *PGR*, *ERBB2*, and *MKI67* in breast cancer FFPE tissue by a RT-qPCR kit (MammaTyper®).
- Low Risk Prediction (LRP) model generated from the results of MammaTyper® was demonstrated high predictive value for identifying the Oncotype DX ® recurrence score (ODX-RS) ≤ 25 in patients with ER+/HER2- breast cancer serving as a cost-effective alternative to the Oncotype DX® test.
- However, the prognostic value of the LRP model remains unclear and its performance compared with other prognostic tools such as Adjuvant!© Online needs to be evaluated.

Methods and Materials

- This retrospective study included women diagnosed with T1-2, N0-1, ER+/HER2- BC who received endocrine therapy (ET) ± chemotherapy (CT) between 2014 and 2018 at Peking University First Hospital.
- Patients were classified as low-risk or high-risk using MammaTyper® LRP model with a cut-off of 3.91.
- A modified version of Adjuvant!© Online was used to determine clinical risk groups.
- Distant disease-free survival (DDFS) was compared using log-rank tests and Cox proportional hazards models.

Results

A total of 402 eligible patients were included for classification as low-risk (LRP-low) or high-risk (LRP-high) using MammaTyper® LRP model with a cut-off of 3.91 (full-set). 352 samples of 402 were eligible for the modified version of Adjuvant!© Online (Adj-set) and successfully classified into clinical high-risk (C-high) and low-risk (C-low) groups. The median follow-up times were 85 months in both sets.

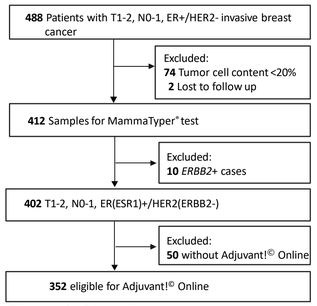


Figure 1. Flowchart.

LRP Stand-alone in the Full-set

- LRP low-risk patients in the full-set had significantly better 9-year DDFS than high-risk patients (96.2% vs. 87.0%, log-rank p=0.0021).

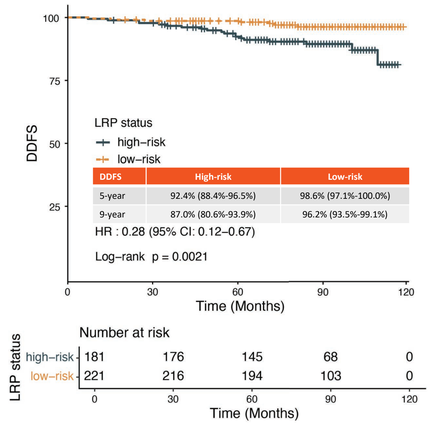


Figure 2. Kaplan-Meier curves for DDFS according to the LRP risk groups

- LRP was an independent prognostic factor for DDFS (adjusted HR 0.37 [0.14–0.97]).
- No significant DDFS differences were found between ET and ET+CT in LRP low-risk patients (HR 0.38 [0.05–3.17]).
- Significant differences in 9-year DDFS between the LRP low-risk and high-risk groups were observed in subgroups of patients aged >50 years, premenopausal patients, T2 stage, N1 stage, histological grade 2, and the chemotherapy (CT) group (all p < 0.05).

References

1. Lehr. et al. Prediction of oncotype DX® results based on local gene expression measurements by MammaTyper®. Cancer Res (2018) 78 (4_Supplement): P1-06-11. https://doi.org/10.1158/1538-7445.SABCS17-P1-06-11.
2. Lehr. et al. Standardized prediction of Oncotype DX® risk classes by local RT-qPCR. Cancer Res (2019) 79 (4_Supplement): P2-07-08. https://doi.org/10.1158/1538-7445.SABCS18-P2-07-08

LRP Compared with Adjuvant!© Online

- The LRP model showed greater statistical significance in differentiating low-risk from high-risk groups in terms of DDFS compared to Adjuvant!© Online (log-rank p = 0.0015 for the LRP model vs. log-rank p = 0.016 for Adjuvant!© Online).

Table 1. DDFS according to the LRP risk groups and clinical risk groups.

	DDFS	High-risk	Low-risk
LRP	5-year	91.6% (87.1%-96.3%)	98.5% (96.8%-100.0%)
	9-year	86.5% (79.6%-94.1%)	96.7% (94.1%-99.3%)
Adjuvant!© Online	5-year	93.4% (89.7%-97.3%)	97.6% (95.4%-100.0%)
	9-year	88.4% (82.5%-94.7%)	96.3% (93.4%-99.3%)

- Patients were categorized into four combined risk groups: C-low/LRP-low (33.5%), C-low/LRP-high (15.9%), C-high/LRP-low (23.3%), and C-high/LRP-high (27.3%). Patients in the C-low/LRP-low group had the highest 9-year DDFS rate of 97.3% (95% CI: 94.3-100.0%), whereas the lowest rate of 81.3% (95% CI: 70.6-93.6%) was observed in the C-high/LRP-high group.

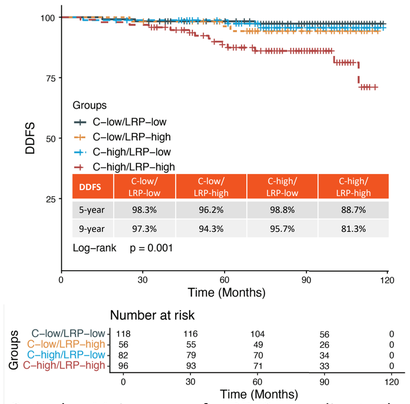


Figure 3. Kaplan-Meier curves for DDFS according to the four risk groups.

Combined Utility of LRP and Adjuvant!© Online

- Patients in the C-high/LRP-low group did not show a significant benefit from adjuvant chemotherapy in terms of DDFS (HR = 0.33, 95% CI: 0.03-3.65), suggesting the combined utility of LRP model with clinical pathological factors in daily clinical practice.

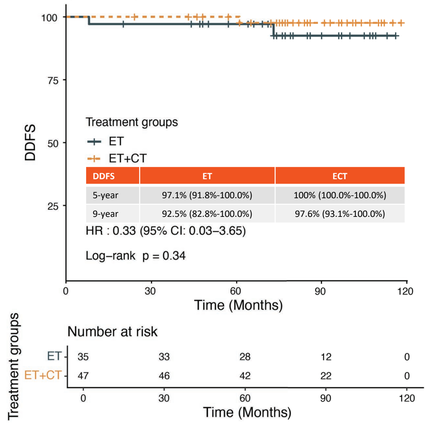


Figure 4. Kaplan-Meier curves for DDFS by treatment groups in the C-high/LRP-low group.

Conclusions

- **The MammaTyper® LRP model identified low-risk patients with higher 9-year DDFS than high-risk patients in T1-2, N0-1, ER+/HER2- breast cancer treated with ET±CT.**
- **No significant DDFS benefits were observed from adjuvant chemotherapy in LRP low-risk patients as well as in C-high/LRP-low group.**
- **Our results suggest that MammaTyper® may be useful as a locally available kit for identifying ER+/HER2- BC patients with low risk of recurrence.**

Contact

Ling Xu
Thyroid and Breast Surgery, Peking University First Hospital, Beijing 10034, China
Email: ling.xu@pkufh.com

PS3-10-06

Copies of this poster are for personal use only and may not be reproduced without permission from SABCS® and the authors.