

The Effects of HER2 Positivity on Invasive Lobular Carcinoma of the Breast



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Background

Compared to invasive ductal carcinoma (IDC), invasive lobular carcinoma (ILC):

- May be less chemo responsive
- Has poorer survival rates
- Has rare HER2 positivity

Aim: to determine the effects of HER2 positivity on cancer outcomes in patients with ILC.

Methods

Retrospective cohort study

- National Cancer Database (2010-2017)
- Included: Stage I to III HER2+ ILC and IDC patients

To compare tumor, patient, and treatment characteristics between HER2+ ILC & IDC:

- Pearson's chi-squared test
- Cochran Armitage test for trend
- Logistic regression model

Overall survival (OS) was evaluated

- Kaplan-Meier method
- Cox proportional hazard model (age, race, Charlson comorbidity index (CCI), year of diagnosis, tumor grade, hormone receptor status, treatment)

Results

- 4798 patients with HER2+ ILC
- 134904 patients with HER2+ IDC
- Most ILC tumors were pleomorphic (58.9%)

Patient and Tumor Characteristics

Patients with HER2+ ILC (vs IDC) were:

- Older
- Non-Hispanic white

But had similar CCI

HER2+ ILC (vs IDC) were more likely to be:

- ER and PR positive
- Lower grade
- Larger in size

But had similar nodal positivity rates

Table 1A: Patient characteristics

HER2+	ILC		IDC		P-value
	n	%	n	%	
Age at Diagnosis (years)					<.0001
18-44	331	7	24,384	18	
45-54	867	18	34,768	26	
55-64	1,375	29	37,214	28	
65+	2,225	46	38,538	29	
Race					<.0001
Non-Hispanic White	3,825	80	95,597	71	
Black	459	10	18,038	13	
Other	514	11	21,269	16	
Charlson Comorbidity Index					0.30
0	4,037	84	114,846	85	
1	594	12	15,750	12	
2	120	3	3,059	2	
3	47	1	1,249	1	

Table 1B: Tumor characteristics

HER2+	ILC		IDC		p-value
	n	%	n	%	
Estrogen Receptor Status					<.0001
Negative	399	8	43,672	32	
Positive	4395	92	91,022	67	
Unknown	4	0	210	0	
Progesterone Receptor Status					<.0001
Negative	1,196	25	63,360	47	
Positive	3,600	75	71,283	53	
Unknown	2	0	261	0.2	
Grade					<.0001
1 and 2	3431	72	51,622	38	
3	907	19	75,148	56	
Unknown	460	10	8,134	6	
Tumor Size					<.0001
< 2 cm	1,981	41	56,563	42	
2 - 5 cm	2,010	42	62,758	47	
> 5 cm	721	15	11,378	8	
Unknown	86	2	4,205	3	
Node Status					<.0001
Negative	2,874	60	79,953	59	
Positive	1,582	33	46,540	35	
Not Identified	342	7	8,411	6	

Table 1C: Treatment characteristics

HER2+	ILC		IDC		p-value
	n	%	n	%	
Radiation					0.22
Yes	2,837	59	79,420	59	
No	1,846	38	51,676	38	
Unknown	115	2	3,808	3	
Chemotherapy					<.0001
Yes	3456	72	106,145	79	
No	1324	28	28,006	21	
Unknown	18	1	753	1	

Figure 1: Patients with HER2+ ILC had a lower OS compared to those with HER2+ IDC

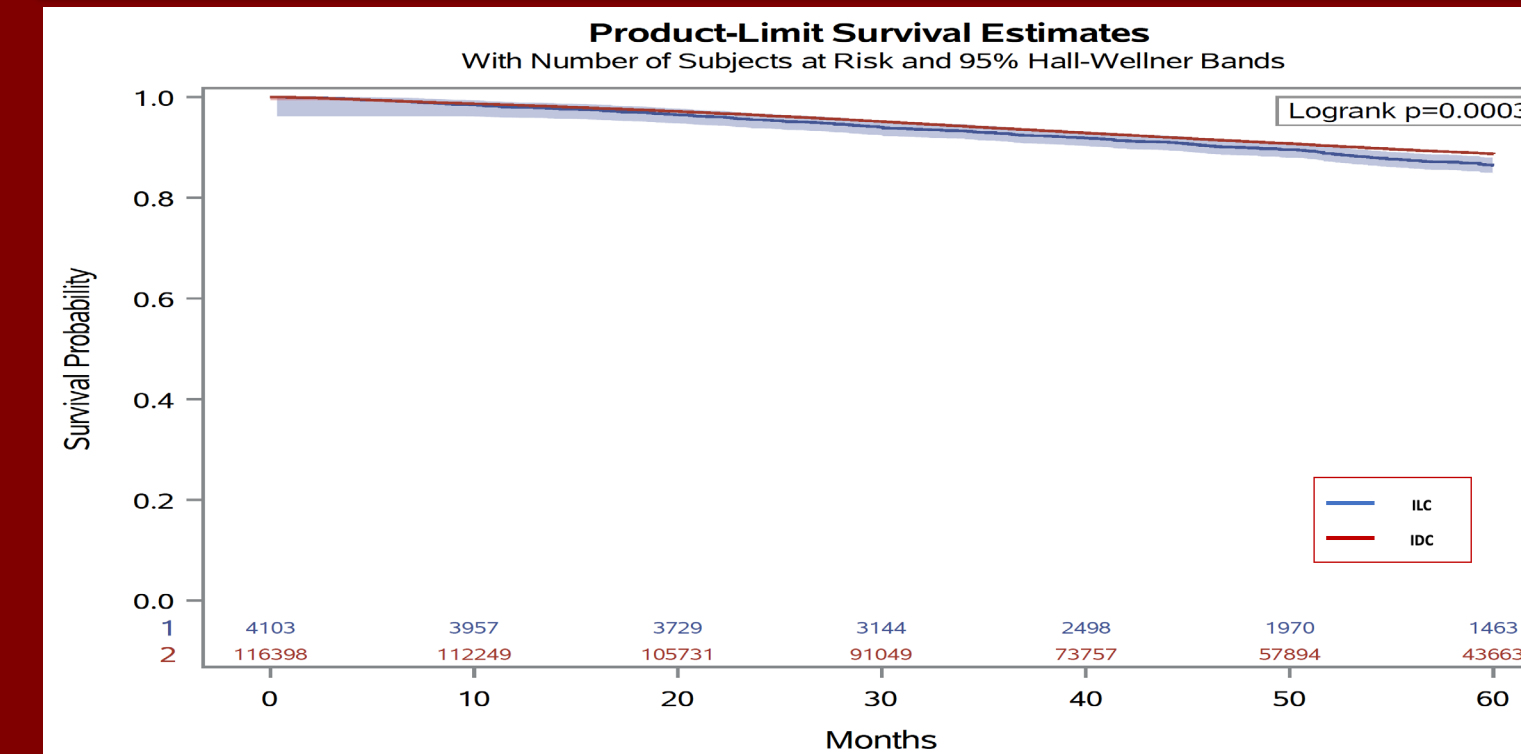


Figure 2: Chemotherapy is associated with higher 5-year OS for HER2+ ILC

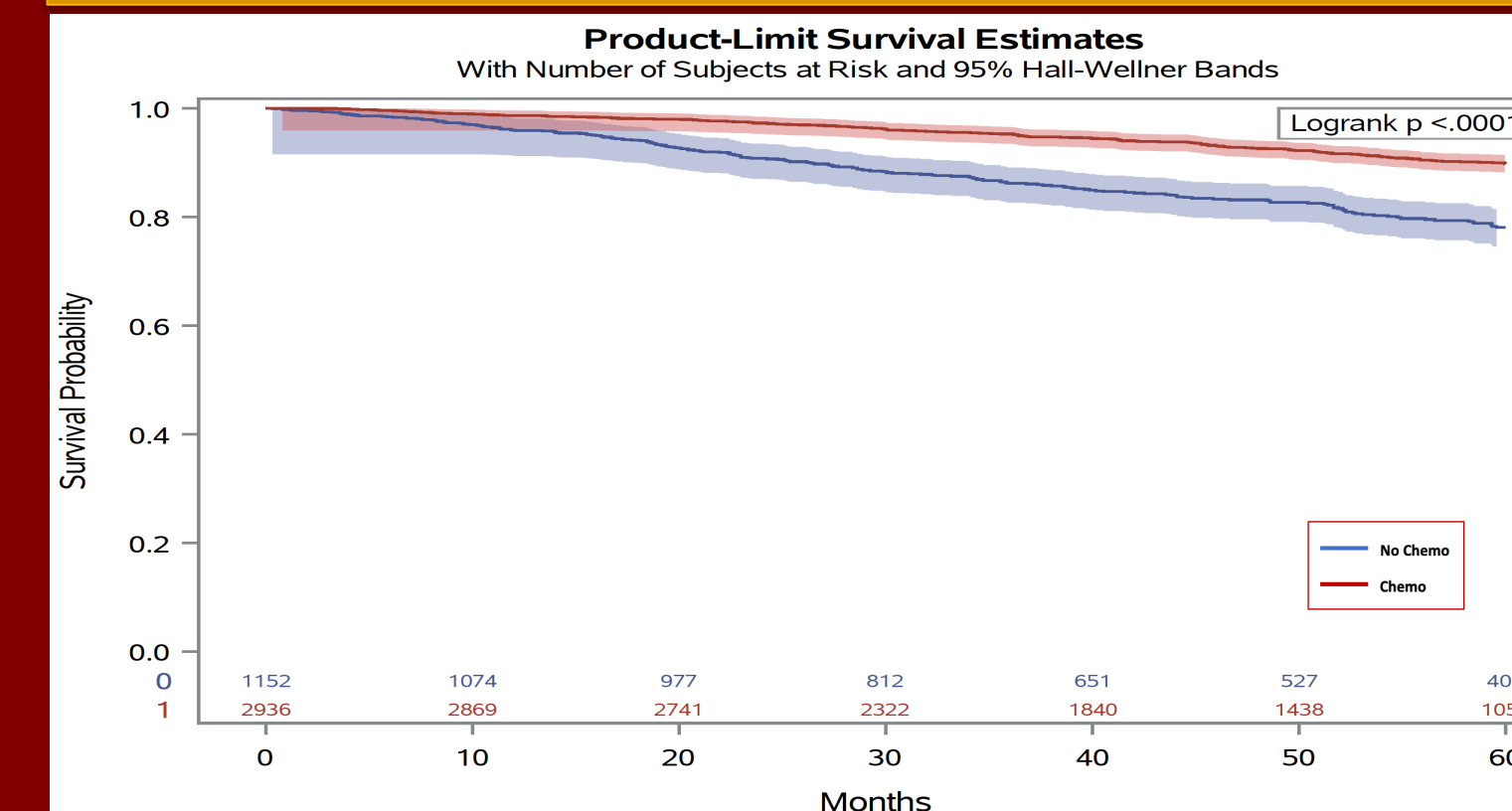
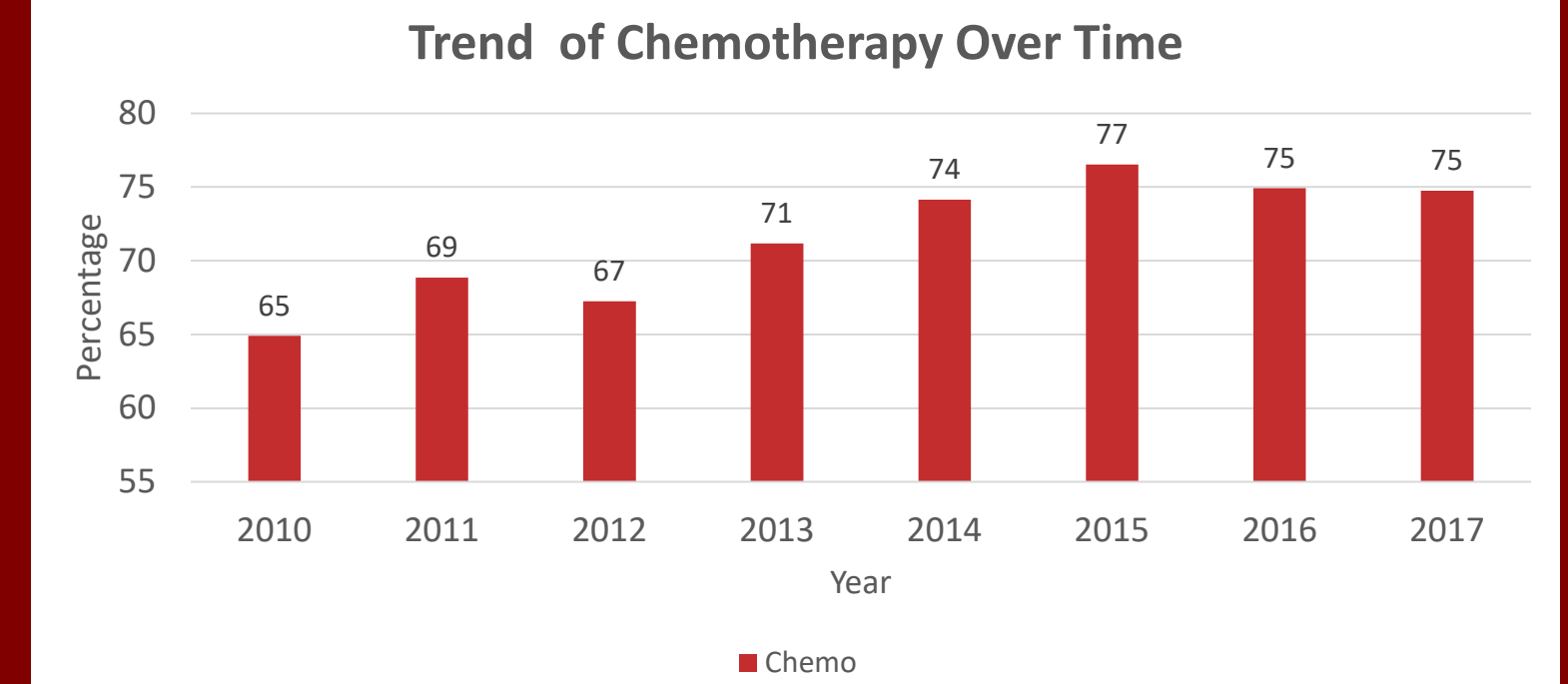


Figure 3: Increasing chemotherapy use over time for HER2+ ILC (Δ9.84%, p <0.0001)



Overall Survival

- 5-year OS 89% (ILC) vs 91% (IDC), p=0.0003

Chemotherapy and OS

- 72% of ILC and 79% of IDC patients received chemotherapy
- 5-yr OS rates:
 - ILC:
 - With chemo: 93%
 - Without chemo: 87%
 - HR 0.87, p<0.05
 - IDC:
 - With chemo: 94%
 - Without chemo: 86%
 - HR 0.97, p<0.05

Conclusions

- HER2+ ILC confers a worse prognosis than HER2+ IDC despite having lower tumor grades and increased ER and PR positivity.
- Unlike for HER2- ILC (and similar to HER2+ IDC) chemotherapy did improve OS for patients with HER2+ ILC.
- Emphasis should be placed on improving rates of chemotherapy delivery to these patients.