

Gene expression validated immunostain panel for breast cancer subtyping

ER	PR	HER2	EGFR	CK5/6	Ki67	Subtype
+	+	-			<18.75%	Luminal A
+	+	+				Luminal/HER2
+	-	-			>18.75%	Luminal B
-	-	+				HER2+
-	-	-	+	+		Basal-like

Tissue Microarrays (N = 4046)

- Early invasive breast cancers, 1986-1992
- Median follow-up = 12.53 years
- Local treatments:
 - (a) lumpectomy + XRT (43.2%)
 - (b) mastectomy (40.4%)
 - (c) mastectomy + XRT (16.4%)
- Adjuvant systemic treatments:
 - (a) No systemic therapy (41.7%)
 - (b) Tamoxifen only (32.0%)
 - (c) Chemotherapy only (18.8%)
 - (d) Chemotherapy + tamoxifen (7.6%)

Statistical Methods

- Local: ipsilateral breast or chest wall
- Regional: ipsilateral axillae, supraclavicular or internal mammary nodes
- Univariable Kaplan-Meier curves for local and regional relapses free survival analysis

Results: Multivariable Cox Model of Regional-relapse free survival

	Hazard Ratio (95% C.I.)	P-value
Tumor size (> 2cm vs ≤ 2cm)	1.25 (0.92-1.71)	0.17
Grade (3 vs 2 or 1)	1.55 (1.09-2.21)	0.015
Proportion of positive axillary lymph nodes involvement		
0-25 vs 0	1.49 (1.00-2.20)	0.05
> 25 vs 0	1.81 (1.19-2.75)	0.0055
Lymphovascular invasion (positive vs negative)	1.50 (1.05-2.13)	0.03
Margin status (positive vs negative or close)	1.11 (0.70-1.76)	0.67
Age at diagnosis, yr		
40-49 vs ≤ 40	0.77 (0.47-1.26)	0.29
50-65 vs ≤ 40	0.76 (0.48-1.21)	0.25
> 65 vs ≤ 40	0.72 (0.44-1.18)	0.19
Breast Cancer Subtypes		
Luminal A	Referent	
Luminal/HER2+	1.95 (1.13-3.37)	0.017
Luminal B	2.35 (1.55-3.57)	5.80E-05
HER2+	2.33 (1.40-3.88)	0.0012
Basal	3.24 (2.07-5.06)	2.80E-07

Conclusion

- Breast cancer subtyping identifies subgroups with distinct local and regional recurrence risks
- May be useful for tailoring local radiotherapy
- Newer targeted systemic treatments may modify this