

Cyclin E

The Correlations between the Expression of Cyclin E and Clinical Features of the Primary Breast Cancer

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Purpose: Cyclin E is a key regulatory protein in the G1-S transition during the cell cycle. The correlations between cyclin E protein and the clinical features of breast cancer were investigated in order to evaluate its clinical utility in invasive breast cancer.

Methods: An immunohistochemical assay for cyclin E was performed in 101 consecutive invasive breast cancers. The correlation between cyclin E expression and the clinicobiological parameters including patient survival was analyzed.

Results: Cyclin E expression was observed in 50 patients (49.5%). The scoring of the cyclin E expression level was divided into low (< 25%) and high (≥ 25%). In high nuclear grade tumors, cyclin E overexpression was much higher than that in low nuclear grade tumors (P=0.049). In the younger age group (< 50 yrs), cyclin E expression was significantly higher than the older age group (P=0.016). No significant correlation was observed between cyclin E and the tumor size, lymph node status, hormonal receptor status, histological grade, mitotic index and Ki67. In multivariate analysis, only the lymph node status was significantly associated with the patients' outcome (P=0.002).

Conclusion: Cyclin E overexpression did not have prognostic impact on the patients' survival rate in invasive breast cancer. In high nuclear grade tumors, the cyclin E expression level was much higher. The definite value

of cyclin E as a clinicobiologic marker should be further investigated by prospective studies with other cell regulatory proteins. (*J Korean Surg Soc* 2002;63:372-377)

Key Words: Breast cancer, Cell proliferation, Cyclin E, Nuclear grade, Prognosis

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 cyclin E G1
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 cyclin E

Table 1. Clinical profiles of the 101 patients

	Number	Percentage(%)
Age		
< 50	65	64.4
≥ 50	36	35.6
Tumor size (cm)		
< 2	22	21.6
2-5	72	72.2
> 5	7	6.2
Axillary LN		
0	52	51.5
1-3	27	26.7
4-9	13	12.9
≥ 10	9	8.9
Stage		
I	15	14.8
II	62	61.6
III	21	20.7
IV	3	2.8
ER status		
+	54	53.5
-	57	46.5
PR status		
+	60	59.4
-	41	40.6
Histologic grade		
I	11	10.9
II	44	43.6
III	46	45.5
Nuclear grade		
I	50	49.5
II	43	42.6
III	8	7.9
Ki67		
Low	67	66.3
Intermediate	19	18.8
High	15	14.9
Mitotic index		
1+	47	46.6
2+	19	18.8
3+	45	44.6
Cyclin E		
Low	51	50.5
High	50	49.5

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1 가 15 (14.9%), 2 가 62 (61.4%), 3 가 21 (20.8%), 4 가 3 (2.9%)

(Table 1).

가 101

(49/101) (52/101) (91%), (68.3%) (67.3%)

1) 3.8×2.2 cm recipient block 2 mm H&E donor block

3 μm 2 mm adhesive coated slide system (Instrument Inc., New Jersey, USA)

101

, 15 95°C 가

. Rabbit polyclonal IgG anti-cyclin E (Santa Cruz Biotechnology, California, USA) cyclin E

가 low cyclin E (<25%), high (≥25%)

Nottingham modification of Scarff-Bloom-Richardson scoring system (9) Ki67, mitotic index

2)

cyclin E

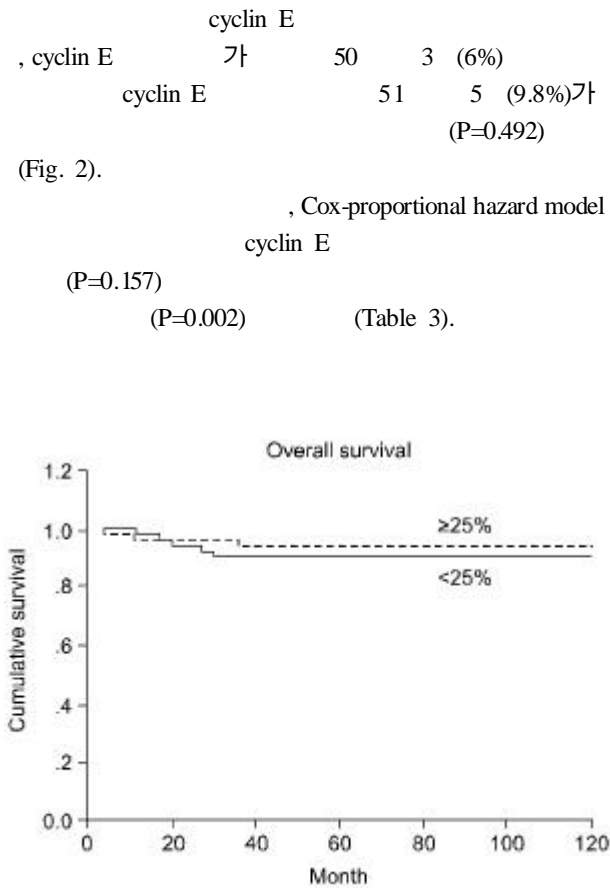


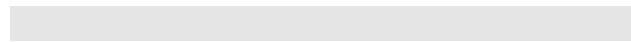
Fig. 2. Overall survival of the patients with primary breast cancer according to cyclin E expression. Overexpression of cyclin E was not associated with overall survival of the patients.

Table 3. Overall survival and disease free survival in 101 primary breast cancer patients

Prognostic factor	Overall survival			Disease free survival		
	Multivariate analysis			Multivariate analysis		
	P-value	B	Relative risk	P-value	B	Relative risk
Age	0.462	-0.036	0.964 (0.876 1.062)	0.461	-0.015	0.985 (0.945 1.026)
Tumor size	0.338	-0.254	0.776 (0.462 1.304)	0.365	-0.128	0.880 (0.668 1.160)
Nodal status	0.002	0.220	1.246 (1.082 1.435)	0.001	0.103	1.108 (1.042 1.179)
ER	0.189	-2.900	0.055 (0.001 4.176)	0.054	-1.289	0.276 (0.074 1.022)
PR	0.080	-2.140	0.118 (0.011 1.289)	0.333	-0.476	0.621 (0.237 1.629)
Histologic grade	0.092	3.343	28.297 (0.581 1377.659)	0.595	0.458	1.580 (0.292 8.544)
Nuclear grade	0.409	1.364	3.910 (0.154 99.517)	0.919	-0.079	0.924 (0.200 4.258)
Mitotic index	0.140	-0.034	0.966 (0.923 1.011)	0.239	-0.012	0.988 (0.969 1.008)
Ki67	0.121	-1.703	0.182 (0.021 1.572)	0.314	-0.497	0.608 (0.231 1.601)
Cyclin E	0.157	0.032	1.033 (0.988 1.080)	0.394	0.010	1.010 (0.989 1.031)

Multivariate analysis was conducted using Cox-proportional hazard model; Results are showed as P value. Relative risk determined by Cox-proportional hazard model; 95% confidence interval in parenthesis. P value less than 0.05 was considered as statistically significant.

Cyclin E G1-S
 . Cyclin E
 가 가
 Ki67 mitotic index
 cyclin E
 가
 p16INK4a p27Kip1, cyclin D1,
 .(16-19,22,23)
 cyclin E
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