

PCNA nm23

Clinical Significance of PCNA and nm23 Expression in Invasive Colorectal Carcinoma

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Purpose: It is known that PCNA (proliferating cell antigen) is associated with cell proliferating activity. We elucidate the relationships of PCNA labeling and nm23 expression in carcinoma cells with survival in patients with invasive colorectal carcinoma.

Methods: Immunohistochemical study was performed using monoclonal antibodies for PCNA and nm23 gene product on 45 cases of paraffin-embedded tissue made of invasive colorectal cancer.

Results: Five-year survival rate was lower in those with high PCNA labeling index than that with low one. PCNA labeling index was not associated with the tumor stages. Expression of nm23 was not associated with survival rate, tumor stage, site, and PCNA labeling index.

Conclusions: Although PCNA labeling index was not associated with tumor stages, this study suggests that PCNA labeling index will be a good prognostic factor in colorectal carcinoma. **JKSCP 2001;17:47-52**

Key Words: PCNA, nm23, Colorectal carcinoma

PCNA (proliferating cell nuclear antigen) nm23

PCNA (repair) DNA homotrimer (repair) DNA RFC (replication factor C) 가 가 DNA sliding clamp clamp loader DNA polymerases() FEN1 (flap endonuclease 1) PCNA DNA 가 p21^{1,2} (Cdk < cyclin dependent kinase > interacting protein 1/ WAF-1) DNA 가 PCNA DNA (cell cycle) G1 DNA p53 p21 PCNA G1 S 가 , mm23 17q21.3-22 , NDPK (nucleoside diphosphate kinase) nm23 18.5 KDa nm23-H1 17 KDa nm23-H2가 88% , NDPK-A NDPK-B⁸⁻¹¹ Steeg K-1735 (murine K-1735 melanoma cell line) nm23 RNA 가 가 (transformation)¹² Leone^{13,14} nm23 (transfection) MDA-MB-435 nm23

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PCNA nm23

1998 1 1990 12 45
 가 가 5
 가 ,
 1)
 4 5 μm xylene alcohol

(1) PCNA (proliferating cell nuclear antigen):

10 mM/l citrate (pH 6.0) microwave , 20 90 95°C 20 30 . 0.3%

10 PBS (phosphate buffered saline) . Blocking antibody Super block (Scytek, Utah, U.S.A.) 10 . PCNA (Transduction laboratories, Lexington, U.S.A.) 0.01% Tween in PBS pH 7.6 200 37°C 1 . 2

UltraTek anti-polyvalent, biotinylated antibody, UltraTek HRP (Scytek, Utah, U.S.A.) 10 PBS , DAB (diaminobenzidine) , Mayer's hematoxylin

(2) nm23:

0.1% trypsin (Transduction laboratories, Lexington, U.S.A.) (KAKO, Denmark) 37°C 30 . nm23 (Transduction labo-

ratories, Lexington, U.S.A.) 200

2)

PCNA

가

3 4 500

labeling index)

(Fig. 1). nm23

가

grade 0,

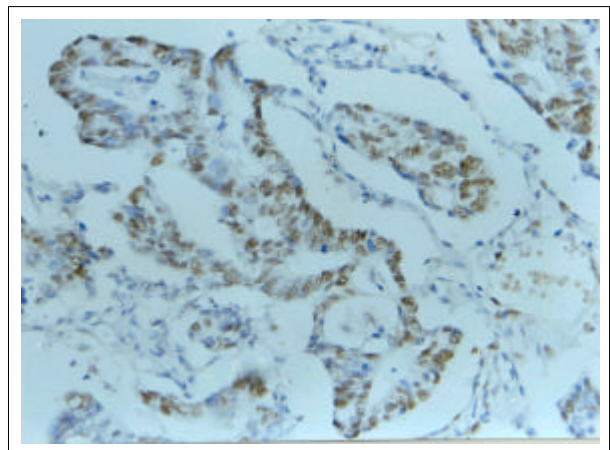


Fig. 1. Immunostaining for PCNA shows a strong positive reaction in the nuclei. × 100, original magnification.

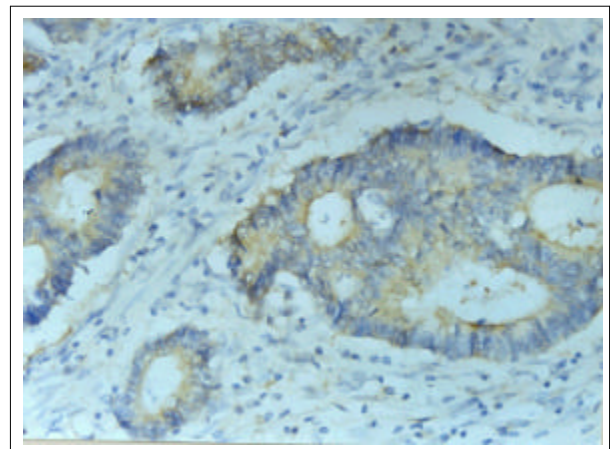


Fig. 2. Immunostaining for nm23 shows positive reactions in the cytoplasm of carcinoma cells (grade 3). × 100, original magnification.

grade 1, grade 2, grade 3 (Fig. 2).
 3) PCNA nm23 Kaplan-Meier log-rank test PCNA nm23 chi-square test, t test, ANOVA One-Way
 1) 22, 23, 28, 83, 57, 54(±13.1), 59.6(±12.6), Astler-Coller B1 8 (17.7%), B2가 17 (37.8%), C1 2 (4.4%), C2가 16 (35.6%), D가 2 (4.4%), 23 (51.1%) 가, 6, 5, S- 4, 가 3, 3, 가 1.
 2) (1) PCNA : PCNA

Table 1. PCNA index according to the site and stage in invasive colorectal carcinoma

	Numbers	PCNA index	p value
Site			
Rectum-sigmoid	30	57.3±23.4	0.50
Cecum-T colon	15	51.8±30.0	
Stage			
B 1	8	60.6±26.7	0.78
B2	17	51.0±25.0	
C1	2	46.5±19.1	
C2	16	56.7±28.3	
D	2	71±12.7	
B1+B2	25	54.1±25.4	0.85
C1+C2	18	55.6±27.2	

PCNA nm23 가 (Table 1). S PCNA 57.3 가 . Astler-Coller B 1+B2 C1+C2 가 . (2) nm23 : nm23 (Table 2). nm23 PCNA (Table 3). (3) PCNA nm23 : PCNA 가 60% 5 60% 5 nm23 grade 0+1 grade 2+3 가 (Fig. 3, 4).

Table 2. Expression of nm23 according to the site and stage in the colorectal carcinoma

	Number	nm23 grade				p value
		0	1	2	3	
Site						
Rectum-sigmoid	30	1	9	12	8	0.270
Cecum-T colon	15	1	2	4	8	
Stage						
B 1	8	0	3	4	1	0.166
B2	17	2	3	7	5	
C1	2	0	2	0	0	
C2	16	0	2	5	9	
D	2	0	1	0	1	

Table 3. Relationship between PCNA index and nm23 expression in the colorectal carcinoma

nm23 expression (grade)	No.	PCNA index	p value
0	2	47.5±38.9	0.92
1	11	58.7±19.9	
2	16	53.4±23.7	
3	16	56.3±31.3	
0+1	13	57.0±21.8	0.80
2+3	32	54.8±27.3	

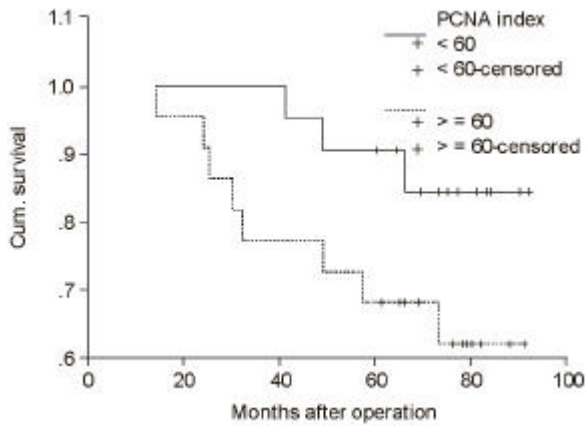


Fig. 3. Patients with low PCNA index show better survival rate than patients with high one.

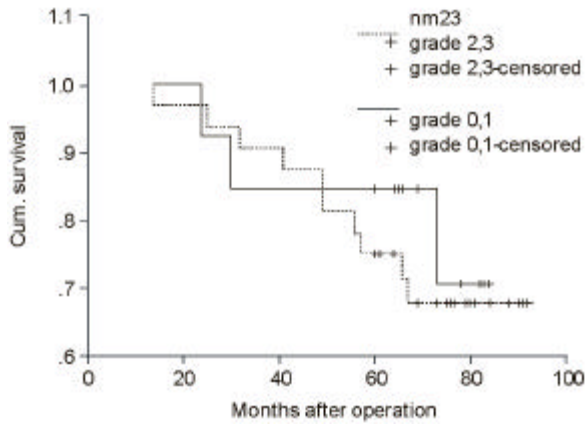


Fig. 4. Survival by nm23 expression in 45 cases of invasive colorectal carcinoma. nm23 expression has no significance in relation to survival.

PCNA

Al-Sheneber PCNA

Dukes 가

, TNM , 가 PCNA , Dukes 가

RNA 가

Garzetti⁶ (curettage)

PCNA 가 30 (disease-free survival)

PCNA 가 (anti-metastatic)

PCNA^{3,4} nm23 (gene product) mRNA (loss of heterozygosity, LOH)^{10,27}

nm23 (overexpression)¹⁶

Berney¹⁵ Dukes B

nm23 Yamaguchi²⁵ nm23-H1 , mRNA 가

Hwang²⁰ nm23-H1 가

Campo²⁶ nm23

17 DNA (aneuploidy)

Okada²⁷ nm23 (allelic defect)

Bauer 가 20% (aneuploidy)²³

²⁴ -

nm23²⁸ nm23²⁹ nm23
 가 . Strivatsa¹⁷
 nm23 (upregulation)
 (ploidy status),
 nm23¹⁸
 가¹⁹ nm23
 가 nm23²¹
 , nm23
 가 가 nm23
 .²² nm23
 . nm23
 nm23
 , nm23 p53
 nm23 가
 nm23
 .^{20,21}
 PCNA
 nm23 가
 가 . 45
 PCNA nm23
 PCNA 가 5
 PCNA

. nm23
 , , PCNA
 가 . PCNA 가

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