

CEA

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= Abstract =

Immunohistochemical Characterization and Plasma Level of Carcinoembryonic Antigen in Ovarian Tumors

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This study was performed to assess the significance of plasma level and histochemical character of carcinoembryonic antigen(CEA) in early diagnosis and prognosis of ovarian tumor. Plasma level of CEA was measured using EIA method and immunohistochemical tissue staining of CEA was done using biotin-strepto avidin complex immunoperoxidase technique.

The percentage of patients with positive CEA level(above 2.5 ng/ml) was 23.1%(6/26) in malignant ovarian tumor and 15.6%(12/77) in benign ovarian tumor. Positive tissue staining of CEA was 42.3%(11/26) in malignant ovarian tumor and 19.5%(15/77) in benign ovarian tumor. In histologic typing, positive tissue staining of CEA was 18.1%(2/11) in serous cystadenocarcinoma, 85.7%(6/7) in mucinous cystadenocarcinoma, 37.5%(3/8) in other malignant ovarian tumors, 7.1%(1/15) in serous cystadenoma, 7.1%(1/14) in mucinous cystadenoma and 27.1%(13/48) in other benign ovarian tumors.

Among 5 cases of malignant ovarian tumors with positive CEA level, 3 cases(60%) showed positive tissue staining of CEA, whereas among 21 cases of malignant ovarian tumors with negative CEA level, 8 cases (38.1%) showed positive tissue staining of CEA. However, among 11 cases of benign ovarian tumors with positive CEA level, 4 cases(36.4%) showed positive tissue staining of CEA, whereas among 66 cases of benign ovarian tumors with negative CEA level, 11 cases(16.7%) showed positive tissue staining of CEA.

In the 3 year follow-up study of 12 cases with malignant ovarian tumor, among 3 cases with positive tissue staining of CEA, 2 cases(66.7%) survived. In 9 cases with negative tissue staining of CEA, 6 cases(66.7%) survived.

In conclusion, these results suggest that the measurement of tumor CEA may be of value in the differential diagnosis of malignant and benign ovarian tumor, especially in diagnosing

mucinous cystadenocarcinoma. However, due to the small amount of cases available for study, it was difficult to determine the correlation between the prognosis and tissue CEA staining of ovarian tumors.

Keywords: Ovarian tumors, Plasma level of CEA, Tissue staining of CEA

Test 가 18 25
 tube conjugate 200 μ l , standard
 S1 tube 1, 2 가, standard S2 tube
 3, 4 가, control serum 50 μ l tube
 11, 12 , 가 50 μ l tube 13 가 .
 1 37 2
 chromogen buffer 200 μ l 가 .
 30 18 30 stopping solution
 dman(1965) Gold Free- 100 μ l 가 Behring ELISA photometer CEA
 antigen(CEA) Carcinoembryonic (oncofetal antigen) BioGenex Laboratory Biotin-strepto Avidin Immu-
 nostaining kit peroxidase anti-peroxidase(PAP)
 CEA technique . 10%
 3 μ m
 Crohn's disease, , Avidin-biotinylated pero-
 xidase complex(ABC) CEA
 (Kleinman et al., 1972; Martin et al., 1972) CEA xylene
 가 , PBS
 가 (phosphate-buffered saline, 10ml, pH 7.6) 5
 3% H₂O₂ 5 PBS 2
 CEA CEA . 1 2
 mouse 5
 1 monoclonal CEA PBS 20 ,
 30 , PBS
 2 biotinylated anti-mouse immu-
 noglobulin 30 , PBS 2
 avidin-biotin peroxidase reagent
 30 . 1
 DAB(diaminobenzidine-4 HCL, Sigma) 0.1gm
 H₂O₂ 0.02ml Tris-buffer 100ml
 . Hematoxylin
 balsam
 1990 1 1993 12
 108 (26 ,
 5 , 77)
 CEA CEA
 CEA Enzygost-CEA[®] pack(Bering)
 (EIA)

1. CEA
 CEA 26 6
 (23.1%) (2.5ng/ml),
 I 2 (16.7%), II 0 (0%), III
 3 (42.9%), IV 1 (20%)
 77 12 (15.6%) (Table 1).

Table 1. Incidence of elevated plasma CEA level in ovarian tumors

type	no.	plasma CEA(ng/ml)	
		< 2.5	2.5
malignant	26	20(76.9%)	6(23.1%)
stage	12	10	2(16.7%)
stage	2	2	0(0.00%)
stage	7	4	3(42.9%)
stage	5	4	1(20.0%)
benign	77	65(84.4%)	12(15.6%)

2. CEA ()
 $\bar{x} \pm s$
 CEA
 $1.7 \pm 2.2\text{ng/ml}$, $1.8 \pm 2.4\text{ng/ml}$,
 $1.8 \pm 2.4\text{ng/ml}$,
 $1.4 \pm 1.6\text{ng/ml}$, $1.4 \pm 1.6\text{ng/ml}$,
 $1.4 \pm 1.7\text{ng/ml}$
 (P > 0.05)(Table 2).

3. CEA
 CEA
 26 11 (42.3%) CEA
 I

Table 2. Mean plasma CEA levels according to the histologic type

type	no	plasma CEA(ng/ml)
malignant	26	
serous	11	1.7 ± 2.2
mucinous	7	1.8 ± 2.4
others*	8	1.8 ± 2.4
benign	77	
serous	15	1.4 ± 1.6
mucinous	14	1.4 ± 1.6
others**	48	1.4 ± 1.7

*: Brenner's tumor, Granulosa cell ca., Krukenberg tumor, Undifferentiated cell ca.

**: Endometrioma, Mature teratoma, Parovarian cyst, Corpus luteal cyst

5 (41.7%), II 0 (0%), III 2 (28.6%), IV 4 (80%)
 77 15 (19.5%)

CEA
 CEA
 $1.7 \pm 2.3 \text{ ng/ml}$, $1.8 \pm 2.5 \text{ ng/ml}$,
 (P > 0.05)
 (Table 3).

4. CEA
 CEA

26
 CEA 2 (18.1%),
 6 (85.7%), 3 (37.5%)

Table 3. Relationship of tissue CEA staining and mean plasma CEA levels according to the clinical stage

type	no.	tissue CEA staining			
		positive	plasma CEA	negative	plasma CEA
malignant	26	11(42.3%)	1.8 ± 2.5	15(57.7%)	1.7 ± 2.3
stage	12	5(41.7%)	1.6 ± 2.2	7(58.3%)	1.7 ± 2.3
stage	2	0	-	2(100%)	1.6 ± 2.2
stage	7	2(28.6%)	4.5 ± 4.9	5(71.4%)	1.7 ± 2.3
stage	5	4(80%)	1.6 ± 2.1	1(20%)	1.9
benign	77	15(19.5%)	1.5 ± 1.7	62(80.5%)	1.4 ± 1.6

가
77
(27.1%)
(Table 4).

CEA 가 11 4 (36.4%)
CEA 66 55 (83.3%)
(Table 6).

5. CEA CEA

CEA 가 (2.5ng/ml) 5
CEA 3 (60%)
CEA 가 (2.5ng/ml) 21
CEA 8 (38.1%)
(Table 5).

Table 5. Tissue CEA staining related to plasma CEA levels in malignant ovarian tumors

group	no.	tissue CEA staining	
		positive	negative
elevated plasma CEA	5	3(60%)	2(40%)
normal plasma CEA	21	8(38.1%)	13(61.9%)
Total	26	11(42.3%)	15(57.7%)

6. CEA CEA

Table 6. Tissue CEA staining related to plasma CEA levels in benign ovarian tumors

group	no.	tissue CEA staining	
		positive	negative
elevated plasma CEA	11	4(36.4%)	7(63.6%)
normal plasma CEA	66	11(16.7%)	55(83.3%)
Total	77	15(19.5%)	62(80.5%)

7. CEA

26 가 12
CEA 3
CEA 3 2
(66.7%) CEA 9
6 (66.7%) (Table 7).

Table 4. Relationship of tissue CEA staining and mean plasma CEA levels according to the histologic type

type	no.	tissue CEA staining			
		positive	plasma CEA	negative	plasma CEA
malignant	26	11(42.3%)	1.8 ± 2.5	15	1.7 ± 2.3
serous	11	2(18.1%)	1.5 ± 1.6	9(81.9%)	1.7 ± 2.3
mucinous	7	6(85.7%)	1.8 ± 2.5	1(14.3%)	1.3
others*	8	3(37.5%)	3.1 ± 4.1	5(62.5%)	1.7 ± 2.3
benign					
serous	15	1(7.1%)	2.9	14(93%)	1.4 ± 1.7
mucinous	14	1(7.1%)	3.8	13(92.9%)	1.4 ± 1.6
others**	48	13(27.1%)	1.5 ± 1.8	35(72.9%)	1.4 ± 1.6

*: Brenner's tumor, Granulosa cell ca., Krukenberg tumor, Undifferentiated cell ca.

**: Endometrioma, Mature teratoma, Parovarian cyst, Corpus luteal cyst

Table 7. The comparison study between tissue CEA positivity and survival period

	stage	alive/dead	survival period	CEA positivity
case 1	c	alive	-	neg.
2	b	alive	-	neg.
3		alive	-	neg.
4	c	alive	-	pos.
5		alive	-	neg.
6	b	alive	-	neg.
7	a	alive	-	pos.
8	b	alive	-	neg.
9		dead	1yr	pos.
10	c	dead	3yrs	neg.
11	c	dead	1/2yr	neg.
12		dead	3yrs	neg.

(Finkler et al., 1987).

CEA, -FP, hCG
(Seppälä et al., 1975; Perlin et al., 1976; Purves et al., 1976; Franchimont et al., 1976; Stone et al., 1977).
Gold Freedman(1965)
CEA 가
CEA
(DeSaia et al., 1975; Martin et al., 1972; Tormey et al., 1978).
CEA 200,000dalton M.W. agar
Gel(pH 8.6) -globulin
7S-8S perchloric acid 50%
ammonium sulfate 가
(Shuster et al., 1973; Primus et al., 1974; Luric et al., 1975; Gerber et al., 1978).
Van Nagell (1972, 1975, 1978) DeSaia (1973)

(tumor specific antigen)
1930

가

가 (Reynoso et al., 1972; DeSaia et al., 1975; Gall et al., 1973),

, , ,
(Kleinman et al., 1972; Martin et al., 1972; Gerber et al., 1978; Stevens et al., 1973)
가 (Van Nagell et al., 1978). Stenehill Bendich (1970) CEA가

가 dere-

pression

CEA가 49~81%

CEA

CEA

CEA

CEA

Primus (1974)

Shuster (1973)

CEA

CEA

CEA

CEA

(Goldenberg et

al., 1976).

CEA 21 52% 85.7% 18.1%, 37.5%

(DeSaia et al., 1975; Barrelet et al., 1975; Samoan et al., 1976), Franchimont (1976) Goldenberg (1976) (1990)

Stone (1977) 10ng/ml, Seppälä (1975) CEA

5ng/ml CEA

가 2.5ng/ml 가

CEA 2.5ng/ml Van

Nagell (1978) 8%, 40% 15.6%, 23.1% Van

Nagell (1978)

CEA 108 CEA

I 16.7%, II 0%, III 42.9%, IV 20% CEA

가 (1990) I 11.3%, II 22.5%, III 30%, IV 50% (23.1%), 77 12 (15.6%)

CEA 가 CEA

CEA 26 11 (42.3%) 77 15 (19.5%)

가 가

(Reynoso et al., 1972; Goldenberg et al., 1976), DeSaia (1975) 80%, 50% CEA 26

18.1% CEA 85.7%, 2 (18.1%), 6 (85.7%), 3 (37.5%)

1 (7.1%), 13 (27.1%) 77 1 (7.1%),

Primus (1974) CEA 가 5

CEA CEA 3 (60%)

CEA 가 21 CEA

CEA 8 (38.1%) CEA 가 11

CEA 4 (36.4%) CEA

Goldenberg (1976) CEA 가 66 55 (83.3%)

CEA 가 26

50% CEA 12 CEA

CEA

42.3%, 19.5 3 3 2 (66.7%) CEA

% CEA

9 6 (66.7%)

가 가

가

가

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