CEA CA 19-9

(4)

CEA CA 19-9

(4)

2000 12

_____

_____

_____

2000   **12**

,　　　，　　，

.

.

,

,

.

,

.

,

.

.

2000 　12

CEA CA 19-9

,

.

1996 1 3 1999 12 31

1563 4

.

SAS package program

, , ,

CEA, CA 19-9

(mixed model) .

.

.

47.8 , 40-50 86.0%,

79.0%, 60.5% .

68.6%, 33.3% ,

22 , 24 , 18 .

82.7% 75.6%,

22 , 27.2 , 3

40.4% .

( ) ( ) 73.5% .

(BMI)　　　　22.3(kg/m²),　　　23.8(kg/m²)

　　　　　　　　　　　　　　　　80.5%　　.

　　　　CEA　　CA 19-9

　　　　　　　　　　　　　　　　　　.

　　　　　　　　　　　　　　　　　　　(p=0.001)

(p=0.041)　　　　　CEA　　　　　　　　　　　　　　.

　CA 19-9

　　　　　　　.　　　　　　　　　　,　　　　　　,

　　　　　　　,　　　　　　CEA

　　　　(p=0.030).

　　　　,　　,　　　,

　　　CEA　　CA 19-9

(mixed model)　　　　　　　　,　　　　　　CEA

　　　　　　　(p=0.017).　　,　　CEA

　　　　　　　.

　　CEA　　CA 19-9

　　　　　　　　　　,　　　　　　CA 19-9

　　　　　　　.

　　　,　　CA 19-9　　　　,　,　,

　.　　　CEA

　　　　　　　　　　　　.

: CEA, CA 19-9,　　　,

I.

1.

,

(Tumor maker)   .

.

,   ,

(O'Rourke, 1993).

(Oncofetal protein)   carcinoembryonic

antigen(CEA)

,   carbohydrate antigen 19-9(CA

19-9)   . CEA

1965   Gold   Freedman

,

(Laurence   , 1972)

.   19%   CEA

(Sterens   , 1973; Alexander   , 1976),

. CA 19-9

monosialo-anglioside

(Magnani , 1982),   CEA   CEA

(Green , 1986),

CEA

(, 1990).

(Herbeth, 1980).

.   (1987)

,

.

CEA   CA 19-9

.   ,

.

,   AFP

CEA   CA 19-9

.

CEA、CA 19-9

，

．

2.

CEA,

CA 19-9   ，

．

．

，   CEA、CA 19-9   ．

，   CEA、CA 19-9

．

，CEA、CA 19-9   ，

．

3.

1) (Serum)

  (Blood)

  7% 70ml/kg . 30ml(45%)

  (Cellular elements) 40ml(55%) (plasma) .

  .

  (plasma) (blood collection)

(anticoagulant) .

  plasma calcium

  (clot) (retraction) (clot)

  (fibrin) .

  (serum) . (anticoagulant)

(blood) (fibrin) (fibrinogen)

  (serum) .

2)　　　　　　　　　(Cacinoembryonic Antigen, CEA)

　　　　　　　　(Cacinoembryonic Antigen)　　1965　　Gold　　Freedman

　　　　　　　　　　　　　　　　　　　，

　　. CEA　　　　　　　200,000dalton

　　　　　，　　　　　　，

　　　　　　.

　　　　　.　　　　Thompson,　　Logerfo

(Radioimmunoassay),　Egan　　　　　　　　　　　　(double　Antibody

technique)　　　　　　　　　　　　　　　　　，

　　，　　　，　　　　，

　　　　.　　　　　　　，　　，　　　　　　　　，

　　　　.

3) Cabohydrate Antigen 19-9 (CA 19-9)

Cabohydrate Antigen 19-9 (CA 19-9)   1978   Koprowski
                SW 1116   mouse   hybridoma
                SW 1116   NS 19-9
            carbohydrate antigen   CA 19-9   .
CA 19-9   SW 1116

                                            .

        (300)   mucin   .   epitope
sialylated lacto-N-fuco-pentoase II oligosaccharide   Lewis
                    , Lewis   sialic acid moiety
            .   ,   4-7%   Lewis
                    CA 19-9

    .

    CA 19-9   ,
    ,   ,   ,
                                                            .

                        59%,   86%,   89%,   9%,
        40%   .   ,   ,   ,
                                                            .

    CA 19-9   ,   .

II.

1. (Tumor marker)

(Tumor marker)

,   ,   ,

.   ,

,   ,

(O Rourke, 1993).

,

.

(tumor specific antigen : TSA)

,

(tumor associated antigen : TAA)

(Cooper, 1996).

Bence Jones Protein   1847

(multiple myeloma)

. 1938   Gutman

acid phosphatase   ,   1960

carcinoembryonic antigen(CEA)   - fetoprotein

.

human chorionic gonadotropin(HCG)   prostate-specific antigen
(PSA)   ,   carbohydrate antigen
19-9(CA 19-9), cacer antigen 125(CA 125)
(1).

1.

Tumor Antigens
Carcinoembryonic antigen
-Fetoprotein
CA 125
CA 19-9
Prostate-specific antigen
Hormones
Human chorionic gonadotropin
ACTH
ADH
Calcitonin
Parathormone
Enzymes
Acid phosphatase
Neuron specific enolase
Galactosyl transferase II
Immunoglobulins
Other
Polyamines
$_2$-Microglobulin

,

.   ,

,

.

,

(2).

.

2.

	Affinity

2.

(3).   3

,   .

                  3.

.	
Bence Jones	CRP(C-reactive protein)
	Marker
	-fetoprotein(AFP)
Hemoglobin	Ferritin, KM 01
.	Polyamine, CEA
PIVKA-II	₂-microglobulin
	TPA, CA 19-9, CA 15-3
Mucoprotein, Sialic acid	SCC, PAP, PSA, CA 50
isoenzyme	CA 125, NSE, SP 1
P-III-P	

1)

                  1   screening   .

                                    2   screening   .

screening

hCG ,

calcitonin   2   screening

.

.

.

.

(   )

.   DNA   ,

.

2)   •

.

(broad-spectrum tumor markers)

(relatively organ-spectrum tumor

markers)   .

broad-spectrum tumor markers

.

$_2$-microglobulin, ferritin, CEA, TPA,   polymine   .

,

.

marker   screening

           .

                     relatively   organ‑spectrum   tumor   markers

                                                              AFP,

       PAP(prostatic   acid   phosphatase)   (PSA;   prostatic

antigen),   ·   CA 19‑9 ,   CA 125,

       gonadotropin(hCG),   (,   )   SCC(squmous

cell   carcinoma)   ,

NSE(neuron‑specific   enolase)   .

                              marker   .

                   ,

          .   ,   ,

       .

                                            .

                                                                    .

                                            2   3

       .

3.   CEA   CA 19-9

                    (,   ,   ,   )

                                                       .

              .   .   ,   ,

   ,   ,

                    (Yvan Touitou   , 1998).

   1) Cacinoembryonic Antigen (CEA)

                              (CEA)

                                                       (Gold, 1978;   ,

   1983).   CEA   CEA

                         (Alexander 1976; Herbeth, 1980)

                 .   CEA   Herbeth

   (1980)   ,

      ,   ,   ,

      .

CEA　　　　　　　　　　　　Alexander　　(1976)　　276

　　　　　　　CEA

　　　　　　　CEA　　　　　　　　　　　　　　　　　　, Hirai　　(1977)

　　　　　　　40　　　　　　　　　　　　　　　　　　　CEA

　　　　　　　　　　　　　　　　　．　　　　　　　　　　　　(1981)

　　CEA　　　　　　　　　　　　　　　　　，　　　　　(1994)

　　　　　　　　　　　　　　(CEA)

．　　，　　　　(1981)　　　　　　　　50　　　CEA

　　　　　　　　(1982)　　　　　CEA

　　　，　　　　(1983)

　　　　　　　．

CEA

　　　　(Alexander　，1978;　　　，1979;　　　，1981;

，1983).　　　　(1981)

，　　　(1994)

．

CEA　　　　　　Hansen(1974)　Abbott(1984)　CEA

　　　　(polyclonal)　　　　(monoclonal)

　　　　　　　　　　　　　　　　　CEA

．Alexander　　(1976)

(1987)

. Alexander

(1976)   CEA

(1981)

,   (1981)

.   (1994)   ,

,

1-9   , 10-19   , 20

,

CEA

(P<0.05)   .   ,

CEA   .

Framingham study(1977)   CEA

,   National Institute of

Health   Concensus Development Conference(1980)   CEA

.   Logerfo   (1971)

CEA   ,   .

CEA

(Strauss, 1972).

Benjamin   (1975)   CEA   .

Loewenstein(1977)   Zamcheck(1978)

CEA   ,   10 ng/ml   ,

50%   CEA   .

                (1983)   CEA

                                        .   (1994)

                        ,   ,

                                                                        (4.0± 2.7

ng/ml)   (2.2± 2.9 ng/ml)

                        (P<0.05)   .

                                                        (1994)

                                CEA

                ,   CEA

        (body mass index)

        .

2) Cabohydrate Antigen 19-9 (CA 19-9)

        CA 19-9   ,

        ,   .

                                                                        3   30%

                                                (Farini, 1985 ;

Satake, 1985).   ,

                                                        .

CA 19-9   ,

.   (1998)

                              CA 19-9   ,

        CA 19-9   (r=0.23, p=0.054)   (r=0.28,
p=0.017)   ,

                                      CA 19-9   ,
                                                                    .

        Yvan Touitou   (1998)   CA 19-9

                                                    20 29   CA 19-9

                              60   .

            (1998)   CA 19-9   2.9%   70

        5.9%   ,   (4.0%)   (2.1%)

                              Yvan Touitou   (1988)

            .

                                    ,

(Pittaway, 1986). Paul   (1986)   496

                                                              CA 19-9

                                                              Yvan   (1988)

        .

        Paul   (1986)   CA 19-9

，　　　　　CA 19‑9　　　　　　　　CEA

　　　　　　　　　　　．

　　　　　　　　CA 19‑9

　　　　　　(P=0.038)　　　　　　　．

　　Yvan Touitou　(1998)　21　　　　　　　4.8%　　CA 19‑9

　　　　　　37U/ml　　　　　　　　　　　　，Arakawa

(1985)

　　　　　　　　　　　　20%　　　　CA 19‑9

　　37U/ml　　　　　　　　．

III.

1.

                           CEA   CA 19-9   4

,

(1).

* * * , *	**(BMI)**	* * * *	* * * *

CEA			
1996	**1997**	**1998**	**1999**

CA 19-9			
1996	**1997**	**1998**	**1999**
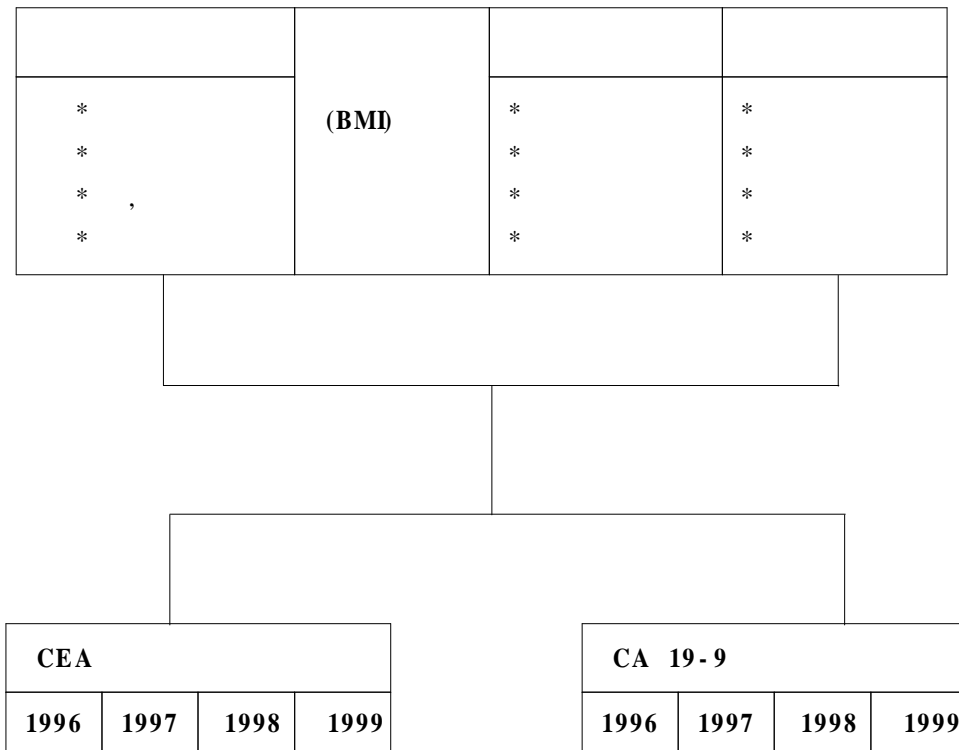
1.

2.

19   (

)   1996

1   3   1999   12   31   4   1563

(1234 ,   329)   (follow‑up study)   .

1996, 1997, 1998, 1999

,   CEA   CA 19‑9

.

,   ,   ,   ,   ,

.   CEA   CA 19‑9

R   D

Immunoradiometricassay kit   .

3.

CEA CA

19-9 , , ,

, .

(Immunoradiometric

assay) (CEA) carbohydrate

antigen 19-9(CA 19-9) .

, (BMI) ,

(4).

4.

(CEA) ⁱ⁾   : ng/ml

CA 19-9 ²⁾   : U/ml

1: , 2:

0
1
2
3
4
5
6

1
2
3

---
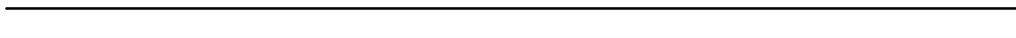
1) *CEA (Carcinoembryonic antigen):*   *(Immunoradiometric assay)* *(ng/ml).*

2) *CA 19-9(Carbohydrate Antigen 19-9):*   *(Immunoradiometric assay)* *(U/ml).*

4.

( )
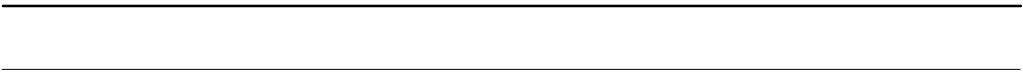
1
2
3

1 1
2 2 3
3 1 2
4 3 4
5 5 6
6

( )

(BMI) kg/m²

/ 1 , 2

4.

CEA   CA 19-9

SAS   (The SAS$^{\circledR}$ System for Window $_{\text{TM}}$(ver 6.12)

.   ,   4   CEA   CA 19-9

(mixed model)   ,

.

.

.

.

.   CEA   CA 19-9   4

(mixed model)   .

.

CEA   CA 19-9   (mixed model)

.

IV.

1.

1)

47.8± 9.0   ,

40- 59   86.0%

1234 (79.0%)   329 (21.0%)   .

60.5%   51.0%   9.5%

.   (BMI)

22.3(kg/ m^2)   ,   23.8(kg/ m^2)   .

80.5%

(5).

5.

29	3 (0.2)[a]	3 (0.2)	0 (0)
30-39	95 (6.1)	64 (4.1)	31 (2.0)
40-49	798 (51.1)	631 (40.4)	167 (10.7)
50-59	545 (34.9)	440 (28.2)	105 (6.7)
60-69	113 (7.2)	88 (5.6)	25 (1.6)
70	9 (0.6)	8 (0.5)	1 (0.1)
	16 (1.1)	9 (0.6)	7 (0.5)
	3 (0.2)	2 (0.1)	1 (0.1)
	22 (1.6)	12 (0.8)	10 (0.7)
	39 (2.8)	19 (1.3)	20 (1.4)
	217 (15.4)	109 (7.7)	108 (7.7)
	851 (60.5)	717 (51.0)	134 (9.5)
	258 (18.3)	249 (17.7)	9 (0.6)
	1258 (80.5)	989 (63.3)	269 (17.2)
	305 (19.5)	245 (15.6)	60 (3.9)
(kg/m^2)	23.1± 2.57[b]	22.3± 2.49	23.8± 2.22
	1563 (100)	1234 (79.0)	329 (21.0)

[a] (%) , [b] ±

2)

490 (31.4%) ,

1073 (68.6%) .

521 (33.3%), 552 (35.3%) .

22 (± 6.22) .

24 (± 7.43) 18 (± 9.25)

(6).

6.

	521 (33.3)[a]	511 (32.7)	10 (0.6)
	552 (35.3)	513 (32.9)	39 (2.4)
	490 (31.4)	210 (13.4)	280 (18.0)
( )	22.5± 6.22[b]	22.4± 6.14	29.9± 7.56
( )	24.8± 7.43	25.0± 7.31	14.3± 6.90
( )	17.9± 9.25	18.0± 9.23	12.0± 8.57
	1563 (100)	1234 (79.0)	329 (21.0)

[a] (%) , [b] ±

3)

270   (17.3%)

1290   (82.7%)   ,

75.6%   .

22   (± 6.09)   7   (± 13.60)   .

3   40.4%

1   2   36.9%   .

(   )   38.1%   ,   (   )

(   )   73.5%   (7).

7.

1179 (75.6)[a]	1080 (69.2)	99 (6.4)
111 (7.1)	69 (4.4)	42 (2.7)
270 (17.3)	86 (5.5)	184 (11.8)
( ) 22.6± 6.09[b]	22.3± 5.00	27.9± 14.41
( ) 27.2± 13.60	27.5± 13.57	16.4± 10.05
( )		
279 (21.8)	176 (13.8)	103 (8.2)
( ) 488 (38.1)	456 (35.6)	32 (2.5)
( ) 455 (35.6)	454 (35.5)	1 (0.1)
2 58 (4.5)	58 (4.5)	0 (0)
3 516 (40.4)	407 (31.9)	109 (8.5)
1-2 471 (36.9)	452 (35.4)	19 (1.5)
3-4 201 (15.8)	195 (15.3)	6 (0.5)
5-6 44 (3.4)	44 (3.4)	0 (0)
45 (3.5)	44 (3.4)	1 (0.1)
1280 (100)	1144 (89.4)	136 (10.6)

[a] (%) , [b] ±

2.   CEA   CA 19-9

1563   CEA(ng/ml)   1996

                            2.6± 1.68(ng/ml)   , 1997   1999

            2.5(ng/ml)   1.54, 1.59, 1.68

      .   CEA

    (2).

2.   CEA

^{*}(   )
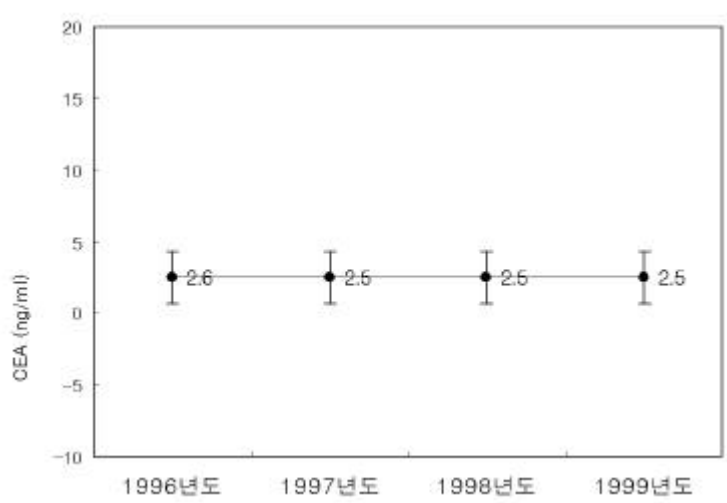
CA 19-9   1996   6.9± 6.93U/ml

, 1997   1998   7.5± 7.15U/ml, 7.3± 7.21U/ml

1999   8.4± 8.00U/ml   .   CA 19-9

(3).
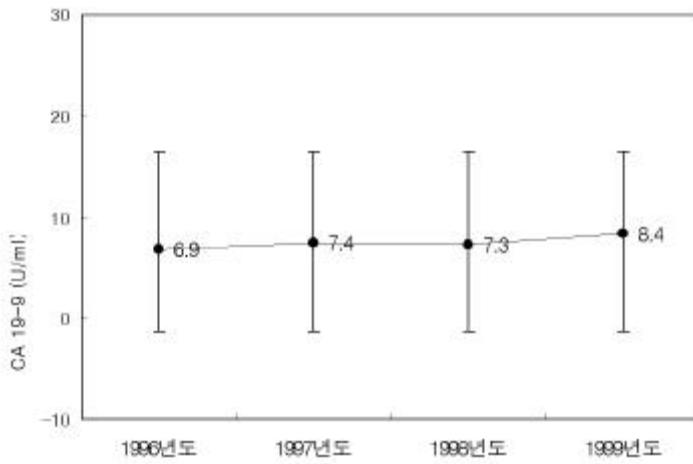
3.   CA 19-9

3.　　　　CEA　　　CA 19-9

(CEA)　　CA 19-9

CEA, CA 19-9

4　　　　　　　　　　　　　　　　(mixed model)

.

1)

　　CEA　　CA 19-9　　　　　　　　　　　　　　　　　，

CEA　　CA 19-9　　　　　　　　　　　.

2)

　　　　　　　CEA　　CA 19-9　　　　　　　　CEA

(　　4).　　　　，　　　　　　　　　　　　　(　　8).　　　CA 19-9

CEA

(　　5)(　9).
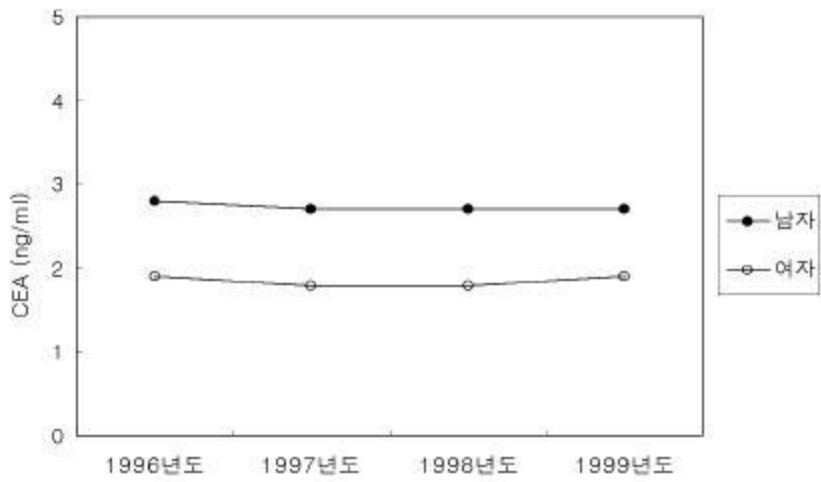
4.   CEA

*(   )

8.   CEA

			t	P-value
( )*	-3.1412	2.3901	-1.31	0.1890

*(   )   reference group   .
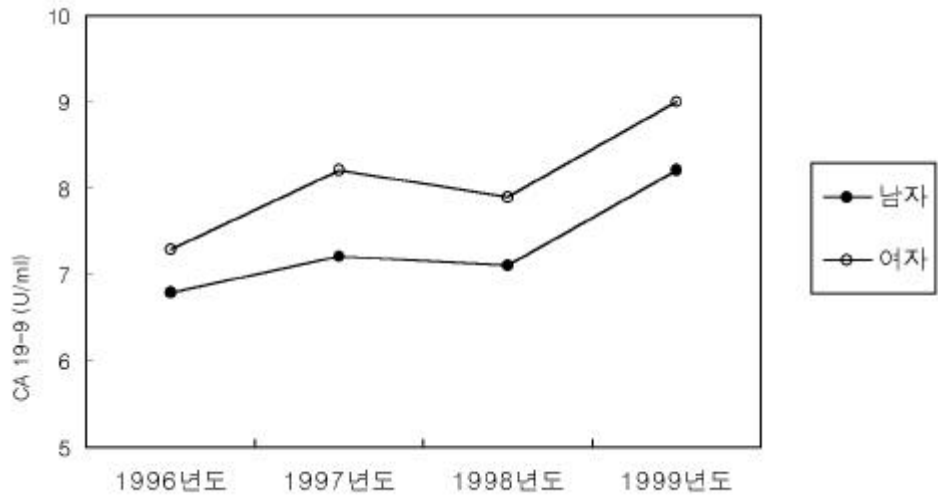
5.   CA 19-9

*(   )

9.   CA 19-9

			t	P-value
( )*	3.9238	8.3272	0.47	0.6376

*( )   reference group   .

3)

,

, CEA

3.1± 1.85ng/ml ,

2.4± 1.37ng/ml, 2.0± 1.25ng/ml

CEA (6).

6. CEA

*( )

CEA

(7, 8).

7.   CEA
*(   )

8.   CEA
*(   )

CEA

CEA
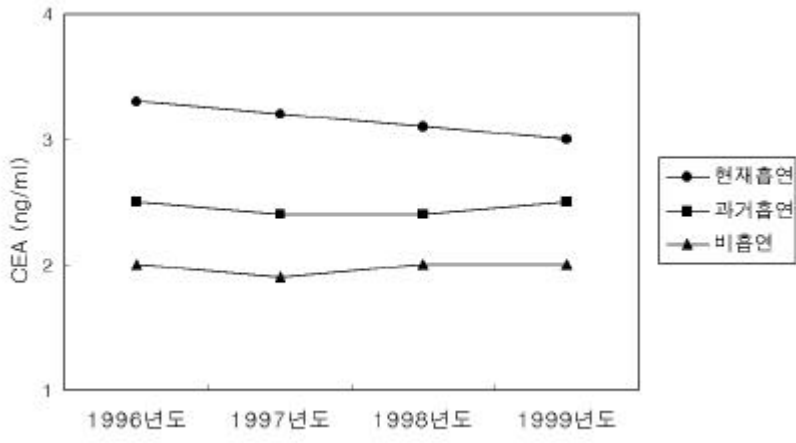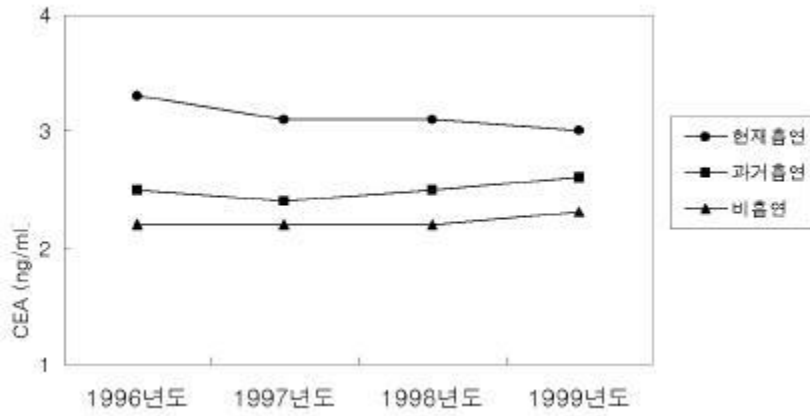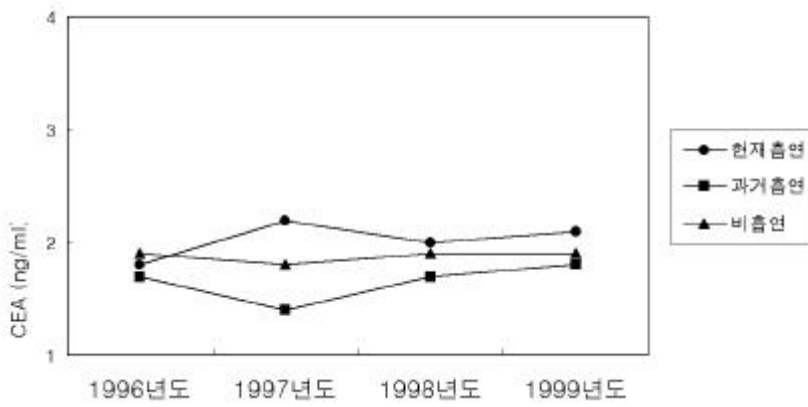
(P=0.001)(　　10).　　　　　　　　　　　　　　　　　　,

,　　　　　　　　　　　　　　　　　　　　　　　　CEA

(P=0.03).　　　　,

(　　11).

　　　　　　　　　10.　　　　　　　CEA

				t	P-value
(　　　)*	7.5893	2.4141	3.14	0.0017
(　　　)*	0.0082	2.3811	-0.00	0.9972

*( ) *reference group* .

　　　　　　　11.　　　　　　　　　　　　　　CEA

			t	P-value
-0.5099	0.2848	-1.79	0.0740
0.5462	0.2515	2.17	0.0303
0.1265	0.1766	0.72	0.4742

CA 19-9   ,

　　　　7.2± 7.05ng/ ml, 7.4± 7.13ng/ ml   ,   7.8±

7.42ng/ ml   CA 19-9

　　(　　9).
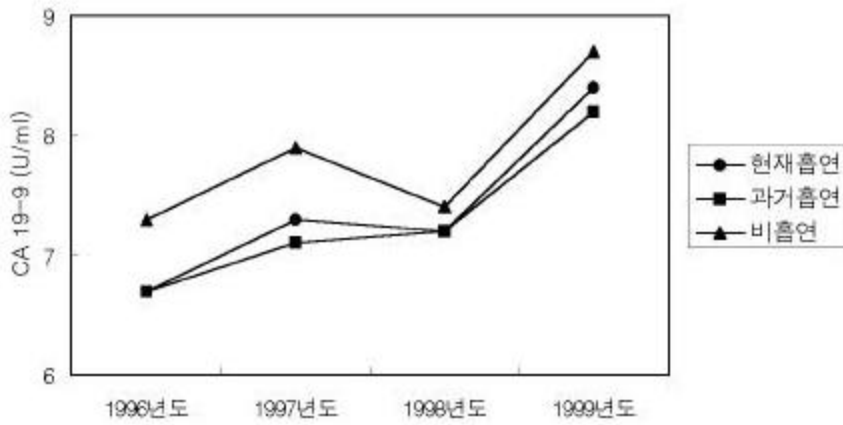
9.   CA 19-9
　　　　　*(   )

CA 19- 9

(10, 11)
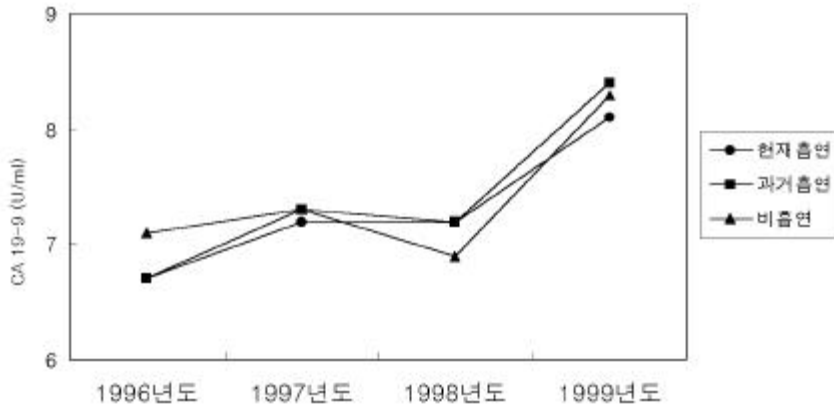
10.   CA 19- 9

*(   )
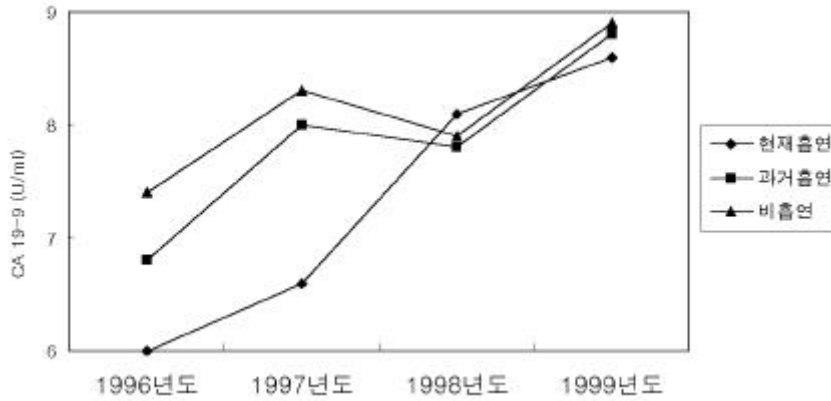
11.   CA 19- 9

*(   )

CA 19-9

(　 12).

　 , 　 ,

(　 13).

　 12. 　 CA 19-9

			t	P-value
(　)*	- 6.3227	8.4505	- 0.75	0.4544
(　)*	- 13.3735	8.3349	- 1.60	0.1088

* *( )　reference group　.*

　 13. 　 CA 19-9

			t	P-value
	- 1.0384	0.9583	- 1.08	0.2790
	- 0.8804	0.8110	- 1.09	0.2782
	0.4569	0.6058	0.75	0.4510

4)

, CEA

, CEA

2.6± 1.62ng/ml ,

2.7± 1.99ng/ml, 2.1± 1.38ng/ml

CEA (

12).

12. CEA

*( )

CEA

(13),   (14).

13.   CEA

*(   )

14.   CEA

*(   )

CEA

CEA   ,
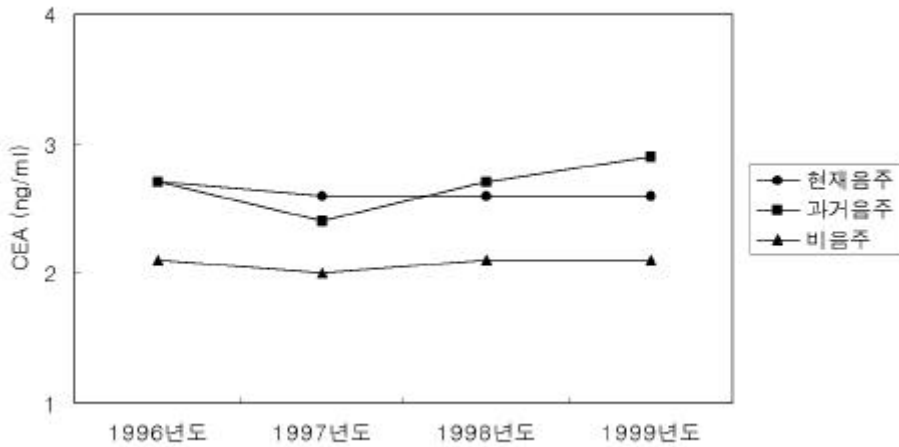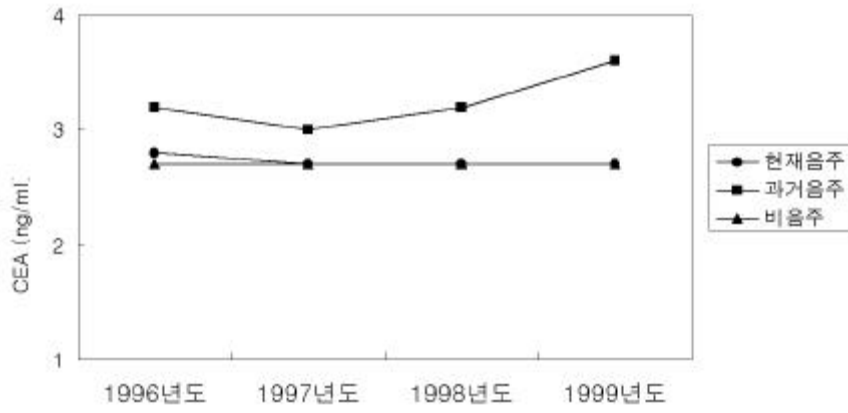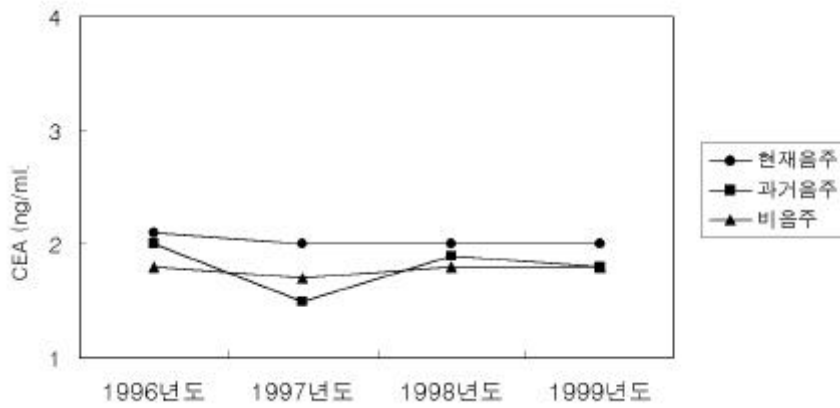
(P=0.041),   (14).

            ,   ,   CEA

                                                          (15).

14.   CEA

			t	P-value
( )*	5.2828	2.5879	2.04	0.0414
( )*	6.1534	4.3529	-1.41	0.1577

* (   )   *reference group*   .

15.   CEA

		t	P-value
-0.1739	0.2412	-0.72	0.4711
0.0267	0.0983	0.27	0.7854
1.1859	1.2224	0.97	0.3322
0.3495	0.8767	0.40	0.6902

CA 19-9

7.4± 7.09U/ ml, 7.5± 7.68U/ml   ,

8.0± 8.16U/ml

CA 19- 9   (15).
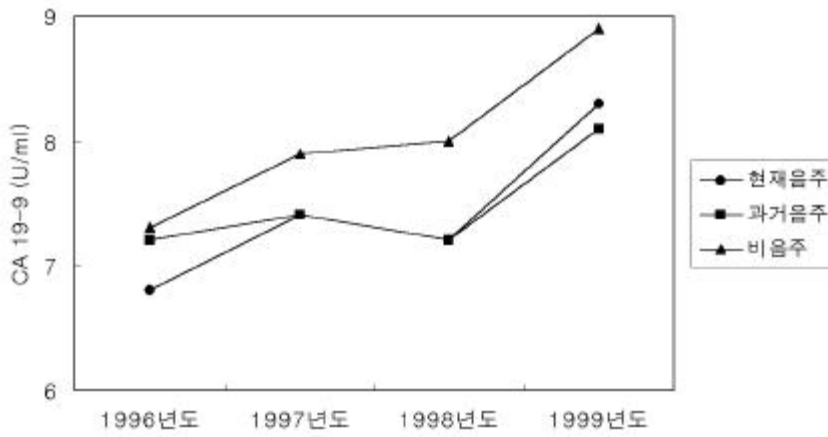
15.   CA 19- 9
                *(   )

CA 19-9

(16, 17).
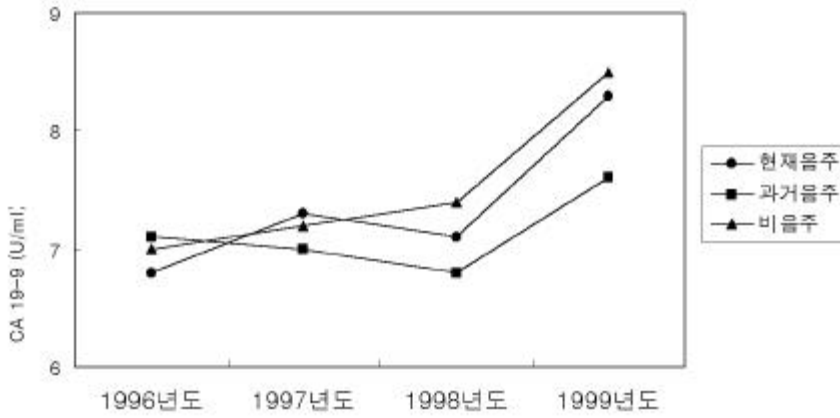
16.   CA 19-9

*(   )

17.   CA 19-9

*(   )
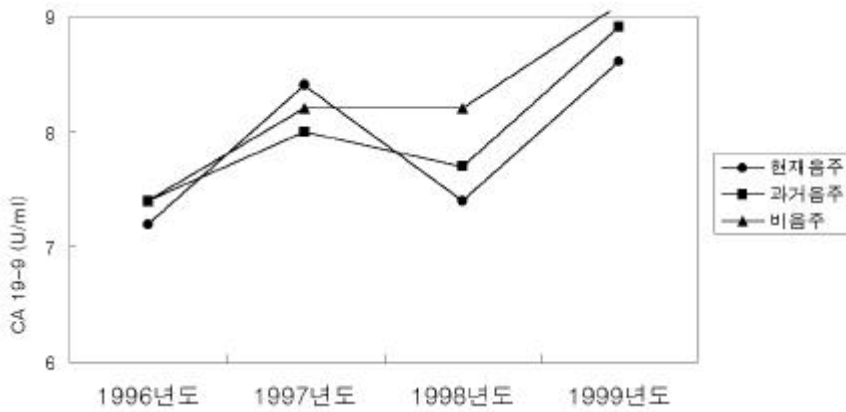
CA 19-9

CA 19-9

（　16）.　　　　　　　　　　　　　　　　，　　　　，

CA 19-9

（　17）.

16.　　　　　CA 19-9

			t	P-value
（　　　）*	- 3.0833	9.0673	0.34	0.7339
（　　　）*	- 21.8457	15.2513	1.43	0.1522

*（　）　reference group　　.

17.　　　　　　　　　　CA 19-9

			t	P-value
	0.7119	0.7698	0.92	0.3554
	0.5390	0.3476	0.16	0.8768
	2.2298	4.3925	0.51	0.6118
	2.0284	3.1548	0.64	0.5204

5)　　　　　/

CEA　　 CA 19-9

CA 19-9

(P=0.010)(　 18, 19).

　　　 18.　　　　　/　　　　 CEA

			t	P-value
(　　)*	1.7109	2.4622	0.69	0.4872

*(　) reference group　.

　　　 19.　　　　　/　　　　 CA 19-9

			t	P-value
(　　)*	27.9741	8.5778	2.56	0.0105

*(　) reference group　.

6)

(body mass index)

,   CEA   CA 19-9

          .   ,   CEA, CA 19-9

                              .

7)   CEA   CA 19-9

                      ,   ,   ,

          CEA   (mixed

model)   ,   CEA   20

                                                        (P=0.017).

                  20.   CEA

				t	P-value
( )		1.927	3.435	0.56	0.5748
		0.058	0.145	0.40	0.6875
( )[*]		7.039	2.963	2.38	0.0177
( )[*]		0.014	2.863	0.01	0.9959
( )[*]		5.363	3.158	1.70	0.0896
( )[*]		-5.799	4.503	-1.29	0.1980
BMI		-0.851	0.427	-0.99	0.4066
( )[*]		-1.657	2.466	-0.67	0.5018
[**]		-0.009	0.010	-0.90	0.3435

  [*] ( )   reference group   .   [**]1996

CA 19-9　　　　　　　　,　　,　　　,

CA 19-9

(mixed model)　　　　　　　　　,　　CA 19-9

21.

(P=0.013).　　　,

.(　21)

21.　　　CA 19-9

			t	P-value
(　)	2.801	12.031	0.23	0.8159
	0.302	0.509	0.59	0.5533
(　)*	-8.481	10.378	-0.82	0.4139
(　)*	-18.462	10.027	-1.84	0.0658
(　)*	9.036	11.060	0.82	0.4141
(　)*	26.756	15.772	1.70	0.0900
BMI	2.302	1.497	1.54	0.1245
(　)*	21.450	8.638	-2.48	0.0131
**	0.474	0.035	1.37	0.0746

*(　)　reference group　.　**1996

V.

1965   Gold   Freedman   20   Dalton

CEA   , 1969   Thomson

CEA   ,

CEA

.   CEA

,   .

CA 19-9   Green   (1986)

CEA   ,

,   .

,   ,

.

. Herbeth   (1980)

,   ,   ,

. Yvan Touitou   (1998)

,   ,   ,   ,

.

CEA　　CA 19-9

,

,　　　,　　　,　　　,　　　,

.

CEA　　CA 19-9

CEA　　CA 19-9　　　　　　　　　　　　　　　　　　　　　.

CEA

CEA　　　　　　　　　　　　Alexander　(1976)

, Hirai　(1977)

40　　　　　　　　　　　　　　　　　　CEA

.　　　　　　　　　　(1981)　　　　　CEA

,　　　　　　　　　　CEA

(1994)　　　　　　　　　　　　.　　　　　　　(1981)

,　　　　(1982)　　　　　CEA

,　　　　(1983)　　　　　　　CEA

.

CA 19-9　　　　　　Yvan Touitou　(1998)　　　　　20

29　　　　　　　, 60　　　　　　　　　　　　　　　　　　.

(1998)

.

, CEA

2.7± 1.6ng/ml   2.5

± 1.1ng/ml(, 1979), 2.4± 1.6ng/ml(,1988)

,   1.8± 1.2ng/ml   1.31± 0.3ng/ml

(,1979), 1.6± 0.6ng/ml(, 1982)   .

CA 19- 9   7.3± 7.0U/ml

8.5± 4.3U/ml(Arakawa, 1985), 9.5± 9.0U/ml(Green, 1986)

,   8.1± 8.1U/ml   11.9±

9.9U/ml(Green, 1986), 10.1± 10.0U/ml(, 1998)

.

,   CEA   ,

CA 19- 9

.

CEA

(Alexander   , 1978;   , 1979;   , 1981;

, 1983)   .   (1981)

,   (1994)

CEA

.

CA 19- 9   Yvan Touitou   (1988)   2700

.   ,   (1998)   CA 19- 9

.

Yvan Touitou (1988)

CA 19-9 ,   .

Hansen(1974)

Abbott(1984)   CEA   (polyclonal)

(monoclonal)

,   CEA   .

Alexander (1976)   CEA

(1981)

.

CEA

(univariate)

,   CEA

(P=0.001).   ,   ,

,   CEA

(P=0.03).   ,   ,

,   CEA

,   (mixed model)

(P=0.017)   CEA

.

(mixed model)

CEA   ,

,

CEA

．

CA 19-9

，　　　　　　　　　　　　　　　，　　　　　　，

(P＞0.05).

Green(1986)　　，Paul(1986)　　　　　　　　　　　　　．　　，

(1998)　　　　CA 19-9　　　　　　　　　(r=0.23, p=0.054)

(r=0.28, p=0.017)　　　　　　　　　，

(　　　　　　r=0.59, p=0.026　；

r=0.74, p=0.003)

．

CEA　　　　　　　　　　　　　　　　　(1994)

，　　　　　　　　　　(mixed model)

CEA

(P=0.041).　　　　　，　　，　　，

(mixed model)

CEA　　　　　　　，　　　　　　　　　CEA

．　　　　CA

19-9　　　　　　　　　　　　　　　　　．

CEA　　CA 19-9

(1994)　　　　　　　．

Loewenstein(1977)　Zamcheck(1978)

CEA , 10 ng/ml

, 50% CEA .

(1983)

CEA .

(1994) , ,

(4.0± 2.7 ng/ml) (2.2± 2.9 ng/ml)

(P<0.05) CEA .

CEA , CA 19- 9

(P=0.01) ,

.

CEA CA 19- 9

,

.

.

,

.

, 40 50 , 4

,

.

, 4   ,

CEA   CA 19- 9

.

.

VI.

CEA   CA 19-9

,

.

1996   1   3

1999   12   31   1563

4   (follow-up)   .

SAS package program   ,

,   ,   CEA,

CA 19-9   (mixed

model)   .   (mixed model)

.

.

47.8± 9.0   ,   40-50

86.0%,   79.0%,   60.5%   .

68.6%,   33.3%   ,

22   ,   24   ,   18   .

82.7%   75.6%,

22   ,   27.2   ,   3

40.4%   .

(   )   (   )   73.5%   .

(BMI)   22.3(kg/m^2),   23.8(kg/m^2)

80.5%   .

CEA   CA 19-9

.

CEA   2.7±

1.6ng/ml,   1.8± 1.2ng/ml   ,   CA 19-9

7.3± 7.0U/ml, 8.1± 8.1U/ml

CEA, CA 19-9

.

((P=0.001)

(P=0.041)   CEA   .

CA 19-9

.   ,   ,

,   CEA

(P=0.030).

,   ,   ,

CEA   CA 19-9

(mixed model)   CEA   ,

(P=0.017)   CA 19-9

CEA

CEA CA 19-9

，CA 19-9

(P=0.010)．

，CA 19-9 ， ， ，

．CEA

1.

，

．

2.

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,   ,   ,   ,   ,   ,   .

CA 19-9, CEA, CA 125   AFP   .

1990;22(2):301-309

:   CA 125   .

1995;38(4):590-596

,   ,   :   Carcinoembrionicantigen (CEA)

.   *1998;8(1):33-41*

,   ,   ,   ,   :

CEA   .   *27:2:206-210, 1982*

,   ,   :   CEA

.   *24:597, 1981*

,   ,   :   ,

CEA   .   *24:581-587, 1980*

,　　　,　　　:

CEA　　　　　　　　.　　　　　　　　　　　*22:3, 1979*

,　　,　　,　　,　　,　　,　　,　　:

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1994;28(3)391- 6

,　　,　　,　　,　　:

CA 19- 9　CEA　　　.　　　　　*1989;36(5)658- 665*

: SAS　　　　　　　,　　,　　　　　　1993

,　　,　　,　　:　.　.　　　　PC- SAS,　　,

1995

=ABSTRACT=

Factors Related to Serum Level of Cacinoembryonic Antigen and Carbohydrate Antigen 19-9 (four year follow-up study)

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(Directed by Professor Dong Kee Kim, Ph.D.)

The purpose of this study was to analyze statistic signification to the factors which have an influence on levels of these tumor markers, especially related to drinking and smoking history, as a observation of the levels of Carcinoembryonic antigen (CEA) and Carbohydrate Antigen 19-9 (CA 19-9) in serum by year.

Data was collected over a period of 4 years, from January 3, 1996 to December 3, 1999, a total of 1563 subjects who visited Center for Health Promotion at a general hospital in Seoul were screened every year. Serum CEA and CA 19-9 levels were quantitated using a radioimmunoassay kit.

Collected material was encoded and analyzed by SAS package

program, subjects characteristics and drinking, smoking were analyzed using technical statistics, the relation between serum levels of CEA, CA 19-9 and affecting factors were analyzed using mixed model.

The results were as follows;

A average age of subjects was 47.8 years old, those who are aged from 40 to 50 were 86.0%, the percentage of men were 79.0%, those who have graduated from university were 60.5%.

Experienced smoking rate of the subjects was 68.6%, the current smoking rate was 33.3% and age at first smoking was average 22 years old, total period of smoking was average 24 years, average number of cigarette per day was 18 pieces.

Experienced drinking rate of the subjects was 82.7%, the current drinking rate was 75.6% and age at first drinking was average 22 years old, total period of drinking was average 27.2 years, drinking less than 3 times per month was 40.4%. Once drinking, 73.5% of them are drinking between a half and one bottle on the basis of so-ju

In body mass index, men were 22.3(kg/m^2), women were 23.8(kg/m^2) and experienced disease rate of subjects was 80.5%.

The serum levels of CEA related to smoking and drinking was statistically significant in current smoking (p=0.001) and current drinking (p=0.041). However, there was no statistically significant difference in CA 19-9 levels related to smoking and drinking.

As a result of analyzing smoking group according to the age at first

smoking, total period of smoking, average number of cigarette smoked per day, statistically significant difference was observed only between the serum levels of CEA and total period of smoking.

Although there was a statistically significant association between CEA and current drinking (p=0.041) and total period smoking (p=0.030), the significance disappeared by mixed model analysis after adjusting sex, age, body mass index, and diseaes history. However, CEA related to the current smoking was statistically significant (p=0.017) as before.

Therefore, there was a statistically significant association between CEA and smoking history.

There were no statistically significant difference in CEA and CA 19-9 related to the body mass index.

In conclusion, CA 19-9 can be used as a stable tumor marker without regard to these factors because it was not affected by age, sex, smoking and drinking history in clinical practices. However, smoking should be considered when CEA is used in smoker.

Key Words : Carcinoembryonic Antigen(CEA), Carbohydrate Antigen 19-9(CA 19-9), smoking, drinking