

## National Survey Results for the Management of Cervical Cancer in Korea<sup>1</sup>

Myon-Woo Shin and Kyeong-Hoon Cho

*Department of Obstetrics and Gynecology, College of Medicine, Seoul National University, Seoul 110-744, Korea*

**=Abstract=** Uterine cervical cancer is the most frequent female malignancy in Korea. This investigation was carried out in order to identify factors associated with cervical cancer and to quantify the relative risk of these factors by surveying a large nationwide series.

This report is based on an analysis of 2,277 cases of cervical cancer diagnosed and treated during 7 years period from January 1976 to December 1982 at 23 hospitals representing all parts of the country. Staging of the cancers was under the auspices of the Korean Association of Obstetricians and Gynecologists. Stage Ib accounted for the largest number (26%) of total 2,205 cases of cervical cancer. The most common age group was from 40 to 49 years old (39%). Eighty-eight percent of cases with cervical cancer were married before the age of 24. It was also noted that there was a marked increase in cases of cervical cancer among widows (12%) as compared to controls (1.9%). Vaginal bleeding was the most common chief complaint. Seventy-eight percent of the cancer was detected by pap smear, 87% by punch biopsy, 21% by colposcopy and 6% of cases by conization. In histologic type, squamous cell carcinoma was most common (93.4%). Surgical procedures were performed in 1,234 cases (60%). The percentage of lymph node metastasis was 9% in stage Ia. The five year survival rate was 90.6% in stage I, 75% in stage II and 26.3% in stage III.

**Key words:** *Cervical cancer, Epidemiology, Clinical stage, Marital status, Five year survival rate*

### INTRODUCTION

Carcinoma of cervix uteri is one of the most important diseases in gynecological field. This is true, not only because of the frequency with which the preinvasive and invasive forms of disease are encountered, but also because much is known about the natural history of this cancer which may serve as a model for the early diagnosis and treatment of other cancers (Maliphant 1949). Cervical cancer is still the most common cancer of all female genitourin-

ary malignancies in Korea. Cervical cancer comprises 44.8% of all cancers in female malignancies in Korea (Rha *et al.* 1980). The epidemiology of cervical cancer is still obscure. It is known that the incidence of disease is greater among blacks, Asian women, women of low income class and married women. The incidence among Jews and nun is low (Towne 1955).

This investigation was carried out in order to identify those factors associated with cervical cancer, to determine the nationwide incidence of this cancer, and to quantify relative risks.

Although many investigations of the high risk factors such as age at first marriage, age at first coitus, frequency of coitus, number of sexual partners, circumcision state of partners, multiple marriage, incidence of separation and divorced, familial and environmental factors have been established by various authors (Christopherson

---

Received 14/10/88; revised 23/11/88; accepted 29/11/88

<sup>1</sup>This article was partly supported by the Korean Association of Obstetricians and Gynecologists (1983).

*et al.* 1970), there are still conflicting claims about many of these factors. The contribution of these variables in terms of their relative risk to the etiology of this disease remains vague (Boyd *et al.* 1964. Martin 1967).

The data collected in this investigation have been subjected to an omnibus analysis and conclusions presented are based on the joint examinations which were carried out nationwide for epidemiologic study, management of cervical cancer, and 5 year survival rate under the auspices of the Korean association of Obstetricians and Gynecologists from 1976 to 1982.

### MATERIALS AND METHODS

All 2,277 cases of cervical cancer treated from January 1976 to December 1982 in a total of 23 hospitals, being member of the Korean Association of Obstetricians & Gynecologists were analyzed. The analysis was done focusing on a total of 21 items from almost all angles.

Total number of cancer patients and affiliated hospitals for cervical cancer study were as follows: 754 cases in Seoul National University Hospital, 294 cases in Yonsei University Hospital, 69 cases in Korea University Hospital, 288 cases in Catholic Medical College Hospital, 63 cases in Han Yang University Hospital, 99 cases in Ewha Women's University Hospital, 161 cases in Kyung Hee University Hospital, 13 cases of Soonchunhyang Medical College Hospital, 13 cases in Inje Medical College Baik Hospital, 99 cases in Kyung Pook National University Hospital, 71 cases in Chunnam National University Hospital, 28 cases in Busan National University Hospital, 31 cases in Chunpook National University Hospital, 91 cases in National Medical center, 16 cases in Seoul Red cross Hospital, 23 cases in Koryo General Hospital, 41 cases in Hangang Sacred Heart Hospital, 4 cases in Seoul Sanitary Hospital, 44 cases in Kwang Joo Christian Hospital, 45 cases in Busan Maryknoll Hospital, 3 cases in Busan Ilsin Women's Hospital, and 5 cases in National Veterans Hospital (Table 1).

This report consists of 21 tables and a short explanation of the method of analysis and the results of each Data on all cases were reviewed and information obtained such as age, symptoms, high risk factors, date and place of original diagnoses, pathologic report and method of

Table 1. Participating hospitals and their case number.

Name of hospital	Case number
1. Seoul National University Hospital	754
2. Yonsei University Hospital	294
3. Korea University Hospital	69
4. Catholic medical College Hospital	288
5. Hanyang University Hospital	63
6. Ewha Women's University Hospital	99
7. Kyunghee University Hospital	161
8. Soonchunhyang Medical College Hospital	13
9. Inje Medical College Baik Hospital	13
10. Kyungpook National University Hospital	99
11. Chunnam National Univsity Hopsital	71
12. Busan National University Hospital	28
13. Choongnam National University Hospital	22
14. Chunpook National University Hospital	31
15. National Medical Center	91
16. Seoul Red Cross Hospital	16
17. Korea General Hospital	23
18. Hangang Sacred heart Hospital	41
19. Seoul Sanitary hospital	4
20. Kwangjoo Chistian Hospital	44
21. Busan Maryknoll Hospital	45
22. Busan Ilsin Women's Hospital	3
23. National Veterans Hospital	5
Total	2,277

management.

Seventy two cases obtained were discarded due to improper description and discrepancy between clinical diagnosis and pathologic diagnosis. A total of 2,205 cases of confirmed cervical cancer patients were reviewed. The results are summarized below.

### RESEULTS

#### 1. Annual distribution of patients by clinical stage

Percentages of cervical cancer by clinical stage in total 2,205 cases were 16% in stage 0, 9% in stage Ia, 26% in stage Ib, 17% in stage IIa and 18% in stage IIb respectively. Among advanced cancer cases, 11% were in stage III and 3% in

Table 2. Annual distribution of patient by clinical stage

Year	Stage 0		Ia		Ib		IIa		IIb		III		IV		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
—1976	20	10	24	11	43	21	34	16	30	14	35	17	24	11	210	100
1977—1978	34	11	26	8	80	25	58	18	64	20	36	11	24	8	322	100
1979—1980	97	14	57	8	180	61	127	19	139	20	63	9	21	3	684	100
1981—1982	211	21	84	9	260	26	160	16	173	18	97	10	4	0	989	100
Total	362	16	191	9	563	26	379	17	406	18	231	11	73	3	2,205	100

Table 3. Distribution of patient by age and clinical stage

Stage Age	0		Ia		Ib		IIa		IIb		III		IV		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
20—29	6	2	5	3	21	4	10	3	6	1	3	1	1	1	52	2
30—39	123	34	48	25	107	19	60	16	35	9	17	7	9	12	399	18
40—49	152	42	84	44	251	45	140	37	144	35	60	26	25	34	856	39
50—59	70	19	45	24	141	25	118	31	163	40	107	46	27	37	671	30
60—69	9	2	9	5	37	7	46	12	45	11	34	15	7	10	187	8
70	2	1	0	0	6	1	5	1	13	3	10	4	4	5	40	2
Total	362		191		563		379		406		231		73		2,205	100

stage IV. Stage Ib was the most common, being 563(26%) of total 2,205 cases of cervical cancer and was followed by stage IIb, 406 cases(18%) and stage IIa, 379 cases(17%).

Approximately 70% of the all cervical cancers fell on stage I or II. The total number cases of cervical cancer could be divided in 2 years intervals as follows, 210 cases before 1976, 322 cases from 1977 to 1978, 684 cases from 1979 to 1980, and 989 cases from 1981 to 1982(Tabel 2).

### 2. Distribution of patients by age and clinical stage

Among the total 2,205 cases, 856 cases(39%) were from the age of 40 to 49 years, 671 cases(30%) from 50 to 59, and 399 cases (18%) from 30 to 39 years, respectively(Table 3).

### 3. Distribution of patients by age of marriage and clinical stage

The mean age of first marriage among Korean women is 24.1 years according to the Korean Institute for Population and Health. Eighty-eight percent of cases with cervical cancer was the group who married before the age of 24. There was a statistically significant difference between

this group and the group married after the age of 24 in the incidence of cervical cancer.

### 4. Relationship between age of marriage and age of prevalence

Of the total of 1,949 cases, 1,706 cases belonged to the early marriage group who married before the age of 24. In this early marriage group, a considerably high prevalence rate of cervical cancer could be found through whole life. And it was particularly highly significant over 50 years of age although the trend was same even in younger age group(20-29). Of 243 cases of late marriage group, 122 cases developed cervical cancer between at the age from 40 to 49 (Table 5).

### 5. Marital status and clinical stage.

A restricted random sampling of 1,500 women as control was drawn from those women who wanted to have an pelvic examination and routine pap smear for screening method of cervical cancer. In these women, pap smear showed negative and had no other gynecologic malignancy. In these 1,500 cases, 68 cases (4.6%) were single, 1,362 cases (90.7%) mar-

**Table 4.** Distribution of patient by age of marriage and clinical stage

Stage Age of marriage	0		Ia		Ib		IIa		IIb		III		IV		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
15—19	49	15	32	20	132	26	126	37	121	34	79	43	21	34	560	29
20—24	236	70	97	60	304	60	188	54	201	56	89	49	31	50	1,146	59
25—29	45	13	28	17	70	14	30	9	31	9	11	6	8	13	223	11
30—34	5	1	3	2	1	0	1	0	0	0	2	1	2	3	14	1
35—	0	0	2	1	0	0	0	0	3	1	1	1	0	0	6	0
Total	335		162		507		345		356		182		62		1,949	100

\*Mean age of marriage in Korea (Korean Institution for Population & Health)  
City: 24.3 year, Rural area: 23.9 year, Mean: 24.1 year.

**Table 5.** Relationship between age of marriage & age of prevalence

Age of Dx. Age of marriage	20-29		30-39		40-49		50-59		60-69		70-		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
15—24	41	95	282	79	647	85	552	94	148	93	36	100	1,706	88
25—34	2	5	75	21	120	16	30	6	10	6	0	0	237	12
35—	0	0	1	0	2	0	3	1	3	1	0	0	6	0
Total	43		358		769		585		158		36		1,949	

**Table 6.** Marital status by clinical stage

Stage Marital status	0		Ia		Ib		IIa		IIb		III		IV		Total		Control	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Single	1	0	6	3	10	2	4	1	3	1	5	2	2	3	32	1.5	68	4.6
Married	338	93	171	90	409	87	310	82	320	79	193	84	56	77	1,878	85.2	1,362	90.7
Window	19	5	13	7	51	9	58	15	71	17	30	13	12	16	254	11.5	28	1.9
Divorced	4	1	1	1	12	2	7	2	11	3	3	1	3	4	41	1.8	42	2.8
Total	362		191		563		379		406		231		73		2,205	100.0	1,500	100.0

ried, 28 cases (1.9%) widow and 42 cases (2.8%) divorced, respectively. Single women who have cervical cancer were 1.5% of total patients and in control group 4.6% of total were single. 85.2% of total patient as compared with 97.7% of control women were married. Widows with cervical cancer comprised markedly higher proportion in total patient (12%) in contrast to widows in control 1.9% (Table 6). In the widow group, out of 254 cervical cancers, 171 cases (70%) were diagnosed as advanced cervical carcinoma from stage IIa to stage IVb and only 83 cases (30%) were early cervical cancer ranging

from stage 0 to stage Ib (Table 7).

#### 6. Distribution of patients by number of delivery and clinical stage

The mean number of children in Korean women was 3.4 (Korean Institute for Population and Health) About 990 cases(45%) had less than 3 children, and 1,189 cases (54%) had more than 3 children. No significant correlation was found between parity and cervical carcinoma (Table 8).

**Table 7.** Clinical stage by marital status

Stage Marital status	O		Ia		Ib		IIa		IIb		III		IV		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Single	1	3	6	19	10	31	4	13	4	13	5	16	2	6	32	100
Married	338	18	171	9	490	26	310	17	320	17	193	10	56	3	1,878	100
Widow	19	7	13	5	51	20	58	23	71	28	30	12	12	5	254	100
Divorced	4	10	1	2	12	29	7	17	11	27	3	7	3	7	41	100
Total	362	16	191	9	563	26	379	17	406	18	231	10	73	3	2,205	100

**Table 8.** Distribution of patient by number of delivery and clinical stage

Stage No. of delivery	O		Ia		Ib		IIa		IIb		III		IV		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0	6	2	7	4	21	4	10	3	4	1	2	1	1	1	51	2
1-3	197	55	87	46	235	42	152	40	164	41	74	32	30	45	939	43
4-6	144	40	86	45	273	49	169	45	195	49	128	56	31	46	1,026	47
7-9	9	3	10	5	29	5	45	12	33	8	22	10	5	7	153	7
10-	0	0	1	1	2	0	1	0	4	1	2	1	0	0	10	0
Total	356		191		560		377		400		228		67		2,179	100

\*Mean number of children in Korean Women (Korea Institution for Population & Health). City: 2.4, Rural area: 3.4, Mean: 2.9.

**7. Relationship between menarcheal and menopausal age and cervical cancer**

To elucidate the influence of menarcheal age, a restricted random sampling of 1,494 cases was drawn from among normal women for cytologic screening in Tumor Registry of SNUH as a control group. Distribution of menarcheal age between control group and cases of cervical cancer was not statistically different. The menarchal age had not significant correlation with all stages of cervical cancer. However, for menopausal age, a random sample was drawn from the patients who visited SNUH without any gynecologic malignancy as a control to calculate the menopausal age. In the early menopausal group, an even distribution was noted for each clinical stage with a slight increase in stage Ib. In the average menopausal group aged from 45 to 54, there was a slight increase in stage IIb. But in the late menopausal group over age 55, 17 out of 39 cases belonged to advanced stage, IIb & III (Table 9).

**8. Relationship between socioeconomic status and cervical cancer**

The educational level was divided into 4 groups, none, primary, middle/high school and college. None and primary educational group encompassed 916 cases (54%) and while the high educational group had 784 cases (47%). In none and primary group the prevalence of cancer was much greater in the advanced cervical cancer. However, in the high educational group, the prevalence of early cervical cancer increased (Table 10).

**9. Cervical cancer complicating pregnancy**

The incidence of cervical cancer complicating pregnancy was 88 (3.9%) out of 2,205 cases (Table 11).

**10. Clinical symptoms**

Among 2,587 cases, 93% of complained of subjective symptoms. Only 63 cases (2%) with cervical cancer had no subjective symptoms.

In 211 cases the cancer was detected by mass screening examination. The mass screening examination in Korea was meaningful not only

**Table 9.** Menarcheal and menopausal age

Stage	O		Ia		Ib		IIa		IIb		III		IV		Total		Control	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Menarchal age</b>																		
10—13	9	21	6	14	12	29	3	7	8	19	2	5	2	5	42	2	90	
14—17	267	18	129	9	398	27	261	18	255	17	122	8	31	2	1,463	76	1,195	
18	44	11	29	7	86	21	82	20	82	29	70	17	23	6	416	22	209	
Total	320	17	164	9	496	26	346	18	345	18	194	10	56	3	1,921	100	1,491	100
<b>Menopausal age</b>																		
—44	9	7	6	5	33	27	21	17	23	19	23	19	7	6	122	16	268	
45—49	35	12	19	6	60	20	50	17	77	26	44	15	15	5	300	39	820	
50—54	25	8	20	6	71	22	58	18	79	25	51	16	12	4	316	40	373	
55—	4	10	2	5	8	21	8	21	8	21	9	23	0	0	39	5	30	
Total	73	9	47	6	172	22	137	18	187	24	127	16	34	4	777	100	1,491	100

**Table 10.** Socioeconomical status

Stage	O		Ia		Ib		IIa		IIb		III		IV		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Background</b>																
<b>Educational level</b>																
None	23	8	23	15	48	10	49	15	58	20	29	25	10	22	240	14
Primary	86	29	38	25	191	40	143	45	142	48	56	48	20	44	676	40
Middle/high	175	58	81	54	206	43	113	36	86	29	31	27	14	31	706	42
College	17	6	9	6	32	7	12	4	7	2	0	0	1	2	78	5
Total	301		151		477		317		293		116		45		1,700	100
<b>Financial tatus</b>																
Very poor	2	1	4	3	20	4	10	3	19	6	4	4	10	20	70	4
Poor	44	14	40	25	101	21	99	30	99	32	49	2-	15	20	447	25
Moderate	237	75	104	65	320	66	195	59	183	59	62	50	21	41	1,122	63
Wealth	31	10	11	7	47	10	25	8	9	3	8	6	5	10	136	8
Total	314		159		488		329		310		124		51		1,775	100
<b>Family history of cancer number</b>																
Total No. of cases	6	2	4	2	12	2	7	2	5	1	1	0	1	1	36	2
Total No. of cases	362		191		563		379		406		231		72		2,205	

for the detection of cervical cancer but also in informing women of the problem of cervical cancer. Vaginal bleeding was the most common chief complaint for hospital visit and about 48% of patients had this symptom. Vaginal discharge was the second most common symptom (34%). Pelvic pain and lymphedema of leg were symptoms of advanced cervical cancer (Table 12).

**11. Duration of symptoms and clinical stage**

A total of 1,415 cases (71%) had symptom durations of less than 6 months, while 343 cases (175) had symptoms for 7 to 12 months. In 12% of the total cases, the duration of symptoms was more than a year. Even for the patients who had symptom duration of less than 6 months, 41 out of 1,415 cases showed stage IV cancer (Table 13).

**Table 11.** Cervical cancer complicating pregnancy

Stage	O		Ia		Ib		IIa		IIb		III		IV		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Gestational week																
—20	2	20	1	10	3	30	3	30	1	10	0	0	0	0	10	11.4
21—32	1	20	2	40	2	40	0	0	0	0	0	0	0	0	5	5.7
33—	9	12	10	14	23	32	9	12	15	21	5	7	2	3	73	82.9
Total	12	14	13	15	28	32	12	14	16	18	5	6	2	2	88	100.0

\*Cervical cancer in pregnancy  $88/2,205=3.9\%$ .

**Table 12.** Clinical symptoms

Stage	O		Ia		Ib		IIa		IIb		III		IV		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Symptom																
Contact bleeding	118	32	100	39	330	51	251	55	249	52	169	53	30	43	1,247	48
Abn. discharge	124	34	75	29	220	34	161	35	182	38	91	29	18	26	871	34
Pelvic pain	49	13	23	9	55	9	34	7	39	8	50	16	14	20	264	10
Lymphedema of leg	—	—	—	—	2	0	—	—	1	0	2	1	5	7	10	0
Asymptomatic	32	9	14	5	17	3	—	—	—	—	—	—	—	—	63	2
Others	45	12	46	18	19	3	8	2	5	1	6	2	3	4	132	5
Total	368		258		643		454		476		318		70		2,587	100

**Table 13.** Duration of symptoms till diagnosis

Stage	O		Ia		Ib		IIa		IIb		III		IV		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Duration (Months)																
—6	219	73	123	73	368	72	257	71	268	72	139	65	41	66	1,415	71
7—12	41	14	22	13	92	18	66	18	64	17	45	21	12	19	343	17
13—24	15	5	6	4	26	5	19	5	25	7	14	7	7	11	112	6
24—	23	8	16	10	23	5	16	4	15	4	13	6	3	5	109	6
Total	299		167		509		358		372		211		63		1,979	100

**12. Method of diagnosis**

Of the 2,205 cases of cervical cancer, 78% of the cases were detected by pap smear, 87% by punch biopsy, 21% by colposcopy and 6% of cases by consization. Almost all of cases were diagnosed as cervical cancer by both pap smear and punch biopsy in all clinical stages (Table 14).

**13. Correlation between pap smear and punch biopsy of cervical cancer**

A total of 2,205 cases were analysed by the primary diagnostic procedures of pap smears and punch biopsies. The positive rate of pap

smear was 82% (1,808 out of 2,205 cases), negative rate was 10% and not performed in 8%. The positive rate of punch biopsy was 95% (2,094 out of 2,205 cases) negative rate was 2% and not performed in 3%. All positive cases were 79% and all negative cases were only 8 cases. The false negative rate of cytology was 9%, false negative rate of punch biopsy was 2% (Table 15).

**14. Relationship between tumor size, appearance and histologic type**

When tumor was smaller than 3cm, the possi-

Table 14. Method of diagnosis

Stage	O		Ia		Ib		IIa		IIb		III		IV		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Dx																
Total No. of cases	362		191		563		379		406		231		73		2,205	
Pap. smear	325	90	157	82	464	82	297	78	274	67	148	64	49	67	1,714	78
Punch biopsy	306	85	163	85	511	91	345	91	356	88	188	81	42	71	1,921	87
Colposcopy	127	35	41	21	11	20	84	22	52	13	39	17	8	11	462	21
Conization	48	13	30	16	28	5	12	3	11	3	5	2	0	0	134	6
D/C/B	25	7	18	9	26	5	19	5	16	4	5	2	3	4	112	5
Others	23	6	28	15	74	13	40	11	90	22	65	28	21	29	341	15

Table 15. Correlation between pap. smear and punch biopsy of cervical cancer

Pap. smear	Positive		Negative		Not performed		Total	
	No.	%	No.	%	No.	%	No.	%
Punch biopsy								
Positive	1,751	79	180	9	163	7	2,094	95
Negative	7	0	8	0	19	1	34	2
Not performed	50	3	22	11	5	0	77	3
Total	1,808	82	210	10	187	8	2,205	100

Table 16. Relationship between tumor size and appearance, histologic type

Size(cm)	Appearance		Histology											
			Squamous cell carcinoma						Adenocarcinoma					
	Exophytic	Endophytic	Large cell Keratinizing		Large cell Nonkeratinizing		Small cell		Adenocarcinoma		Adenosquamous carcinoma			
No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
—1	140	40	212	60	109	32	153	46	74	22	17	81	4	19
1—3	308	65	165	35	155	36	209	49	61	14	19	70	8	30
3—5	236	81	55	19	101	40	129	52	20	8	16	80	4	20
5—	106	82	24	18	36	33	60	55	14	13	7	64	4	36
Subtotal	790	63	456	37	401	36	551	49	169	15	59	75f	20	25
Total	1,246				1,121/1,200(93.4)						79/1,200(6.6)			

\*Number of parenthesis: percent.

bility of endophytic type increased. The exophytic type was 63% and the endophytic type was 37%. In histologic types, squamous cell carcinomas were 1,121 cases (39.4%) and adenocarcinomas were 79 cases (6.6%) (Table 16).

### 15. Method of treatment according to clinical stage

Among the 2,068 cases of cervical cancer, surgical procedures were performed in 1,243 cases (60%), radiotherapy in 417 cases (20%), combined therapy, surgery and radiotherapy in



Table 17. Method of treatment according to the clinical stage

Stage Type of treatment	0		Ia		Ib		IIa		IIb		III		IV		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Surgery	341	96	159	85	401	73	190	54	133	35	16	8	3	6	1,243	60
Radio Tx	5	1	3	2	18	3	71	20	135	35	155	81	30	60	417	20
Chemoth.	0	0	1	1	0	0	0	0	3	1	8	4	3	6	15	1
Surgery + Radio Tx	6	2	25	13	124	23	87	25	104	27	9	5	7	14	362	18
Surgery + Chemoth.	1	0	0	0	6	1	2	1	3	1	1	1	1	2	14	1
Others	1	0	0	0	0	0	4	1	3	1	3	2	6	12	17	1
Total	354		188		549		354		381		192		50		2,068	100

\*Chemoth.: Chemotherapy, \*Radio Tx: Radiotherapy.

Table 18. Method of treatment according to the clinical stage

Stage Type of treatment	0		Ia		Ib		IIa		IIb		III		IV		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total	352		206		656		421		437		164		45		2,281	
Surgery	342		182		431		282		236		27		12		1,612	
Radical hysterectomy & pelvic L/N dissection	91	26	132	72	507	95	271	96	214	91	12	44	7	59	1,244	77
Pelvic exenteration	—	—	—	—	—	—	1	0	2	1	1	4	—	—	4	0
Simple hysterectomy	243	71	47	26	19	4	—	—	—	—	—	—	—	—	309	19
Others	8	2	3	2	5	1	10	4	20	8	14	52	5	41	65	4
Radiotherapy	10		24		125		139		201		137		33		669	
Ext. only	8	80	19	79	99	79	75	43	76	38	19	14	9	27	305	46
Intracavitary	1	10	1	4	1	1	4	3	7	3	9	7	2	6	25	4
Both	1	10	4	17	25	20	60	43	118	59	109	80	22	67	339	51
5,000 RAD	3		3		31		32		46		30		1		146	
6,000 RAD	3		5		47		16		40		7		3		121	
7,000 RAD	1		5		47		16		40		7		3		50	
8,000 RAD	1		1		3		5		5		27		3		45	
8,000 RAD—			3		10		37		42		21		4		117	

362 cases (18%), and surgery plus chemotherapy in 14 cases (Table 17).

In the surgery group, radical hysterectomy with pelvic lymph node dissection was performed in 1,234 cases (77%). Pelvic exenterations were done in 4 cases in stage IIa, IIb and

III respectively. Simple hysterectomy was done in almost all cases of stage 0. Other surgical procedures included open and closure, surgical staging, paraortic lymph node biopsy and exploratory laparotomy, etc. In radiation therapy, intracavitary radium was used first and followed

**Table 19.** Comparison of L. N. metastasis between countries.

Country	Clinical stage	No. of cases	No. of L. N. metastasts(%)
China, 1972	I	670	83(12.3)
	II	450	151(33.5)
Denmark, 1976	Ia	61	1( 1.6)
	Ib	282	28( 9.9)
	IIa	102	25(24.5)
	IIb	67	24(35.8)
France, 1972	I	463	63(13.6)
	II	160	33(20.6)
Japan, 1969	I	296	14( 4.7)
	II	266	59(22.2)
USA, 1976	Ib	107	110( 9.3)
	IIa	86	11(12.8)
	IIb	38	9(23.7)
Korea, 1983	Ia	191	17( 8.8)
	Ib	563	89(15.8)
	IIa	379	111(29.2)
	IIb	406	130(32.0)

**Table 20.** 5 year survival rate by stage in 335 cases of cervical cancer, followed for at least 5 years at OPD and home visit SNUH(1959-1978)

Stage	Total No. of 5 year data	Survivors	
		No.	%
I	192	174	90.6
II	116	87	75.0
III	19	5	26.3
IV	8	6	0.0
Total	335	266	79.4

by external irradiation. This was generally combined with Co60 and linear accelerator(Table 18).

**16. Lymph node metastasis**

In our study, the percentage of lymph node metastases was 9% in stage Ia, 16% in stage Ib, 29% in stage IIa and 32% in stage IIb. (Table 19).

**17. Five year survival rate according to clinical stage**

Five year survival rate according to clinical stage in 335 cases of cervical cancer followed for at least 5 years at outpatient department and home visits at Seoul National University Hospital from 1959 to 1978 is shown in Table 20. The five year survival rate was 174 out of 192 cases

(90.6%) in stage I, 87 out of 116 cases (75%) in stage II, 5 out of 9 cases (26.3%) in stage III and none out of 8 cases in stages IV. Overall 5 year survival rate in all stage of cervical cancer was 266 out of 335 cases (79.4%).

**18. Cause of death**

Thirty one cases of hospital death are analysed in Table 21. Main causes of death were as follows. Uremia and other renal problems were the main causes of death in 14 cases (48%), followed by respiratory failure, sepsis and cachexia. Distant metastasis were present in 2 cases (6%).

**DISCUSSION**

The causes of cervical cancer are unknown, but its development seems to be related to multiple insults and injuries sustained by the cervix (Coppleson *et al.* 1968). In Korea, cervical cancer is the most frequent cancer among female malignancies and has the third highest prevalence among all kinds of malignancies including male malignancies (Rha *et al.* 1980).

The prevalence of cervical cancer has been increasing (Chang *et al.* 1984). Annually, there was increasing tendency of prevalence rate of stage 0 and stage Ib, but decreasing tendency of stage IIa and IIb from 1976 to 1982. This indicates that invasive carcinoma of cervix had been prevented by the detection of the asymptomatic carcinoma

Table 21. Cause of death

Stage	O		Ia		Ib		IIa		IIb		III		IV		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Cause of death																
Uremia and renal problem	—	—	—	—	1	50	6	78	1	14	3	75	3	60	14	48
Resp. failure	—	—	—	—	—	—	—	—	1	14	—	—	1	20	2	6
Cerebral hypoxia	—	—	—	—	—	—	—	—	1	14	—	—	—	—	1	3
Sepsis	—	—	—	—	—	—	—	—	2	29	—	—	—	—	2	6
Cerebral hemorrhage	—	—	1	30	—	—	—	—	—	—	—	—	—	—	1	3
Cardiac arrest	—	—	—	—	—	—	1	11	—	—	—	—	—	—	1	3
Uncertain bleeding	—	—	1	30	—	—	—	—	—	—	—	—	—	—	1	3
Coagulation disorder	—	—	—	—	—	—	—	—	1	14	—	—	—	—	1	3
Pneumonia	—	—	—	—	1	50	—	—	—	—	—	—	—	—	1	3
Cachexia	—	—	—	—	—	—	—	—	1	14	1	25	—	—	2	6
Metastasis	—	—	1	30	—	—	1	11	—	—	—	—	—	—	2	6
Unknown	1	100	—	—	—	—	1	11	—	—	—	—	1	20	3	10
Total	1	3	3	10	2	6	9	29	7	23	4	13	5	16	31	100

with the use of exfoliative cytology (Boyes *et al.* 1976). Far advanced cervical cancer is decreasing in prevalence in recent years. It means that cytologic mass screening which has been popular and the general acceptance rate of mass screening in Korea has been increasing (Christopherson *et al.* 1970). In the USA, the best incidence data of invasive cervical cancer indicated a rate of approximately 10 to 12/100,000/year (Zander 1981). Cancer of the cervix is apparently less frequent in developed countries such as Norway and Sweden. However in the underdeveloped areas of the world, its frequency is significantly greater (Aitken 1966). One wonders whether nutritional deficiencies in those underdeveloped nations play a role in the etiology of cervical cancer (Orr *et al.* 1985).

The prevalence of cervical cancer in younger age groups between 30 to 39 (18%) is much higher than older age group over 60 years (10%). In the group aged 30 to 39, almost all cases were below stage Ib. In the 40 to 49 year group, early cervical cancer was more frequent than advanced cervical cancer. However, from 50 to 59 years old group, there was a tendency to increasing prevalence above stage IIb carcinoma. West (1977) reported that the mean age of cervical cancer patients at registration was 49

years.

There was a significant association between early marriage and cervical cancer. Early marriage may be high risk factor for cervical cancer patients (Christopherson *et al.* 1965). First coitus also occurred at an earlier age in the younger marriage group than in the later marriage group (Martin 1969). This means younger marriage associated with various different high risk factors such as high frequency of coitus, increased number of pregnancies and low socioeconomic status (Terris *et al.* 1967). In our study, early marriage was the high risk factor in all cervical cancer patients through woman life especially after 50 years of age.

High occurrence of cervical cancer in widow group was noted. Widows may have had extramarital partners, high frequency of coitus, multiple number of partners with uncircumcised, a lot of pregnancies (Fasal *et al.* 1981). This evidence had led to claims that one or combination of the factors maintained above are statistically, significantly associated with the high incidence of cervical neoplasm as shown in the previous reports.

Advanced cervical cancer is more prevalent in widow group than early cervical cancer. It means that many cases of widows who do not participate in the mass screening and rare visiting cli-

**Table 22.** Comparison 5 year survival rate between countries

Country	China 1972		Denmark 1976		Japan 1977		Sweden 1973		U.S.A. 1973		Korea 1982	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
I	220/271	81.1	198/243	81.5	1,616/1,894	85.3	3,104/3,533	87.8	112/132	84.8	174/192	90.6
II	104/162	64.2	50/77	64.7	1,511/2,128	70.5	1,501/2,063	72.7	72/92	78.2	87/116	75.0
III	7/16	43.7			149/343	43.4					5/19	26.3
IV	1/5	20.0			0/4	0					0/8	0

nic, therefore begin treatment too late (Larsson *et al.* 1983). On the other hand, in married group, 999 cases (53%) more than half are diagnosed as early cervical cancer in contrast to 779 cases (47%) diagnosed as advanced cervical cancer. The rate of incidence is not significantly different between early and advanced cervical cancer in the married group.

It is the reason for far advanced cervical cancer in the women with late menopausal group that patient misjudged and don't participate in the mass screening examination, therefore advanced cancer results too late to start treatment (Park 1985).

By the financial status, in poor group, the prevalence rate much more increased in advanced cancer, but in the wealthy group, this rate much increased in early cervical cancer (Pejovic 1981). And there is no significant correlation between familial history of cervical cancer and prevalence rate.

The rate of cervical cancer complicating pregnancy is significantly higher than that reported in the USA (1:3,000). The uterine cervix remains overall the most common site for neoplastic disease during pregnancy (Barber 1963). The occurrence of fetal metastases is so rare that its possibility does not influence management decisions (Mikuta 1967).

In order to decrease the percentage of deaths caused by cervical cancer, the general acceptance rate of mass screening should be 100% of registered married women (Wakefield *et al.* 1973).

The use of colposcopy as a method of early detection of cervical cancer tend to highly increase and popular in Korea recently. Other methods included were IVP, CT, lymphangiography, sigmoidoscopy and open biopsy.

In Korea, exfoliative cytology used as a

method of mass screening procedure and punch biopsy employed in confirmation of the diagnosis of cervical cancer.

The ratio between squamous cell carcinoma and adenocarcinoma was 20:1. In the squamous cell variety, squamous cell keratinizing type was 36%, nonkeratinizing type 49%, and small cell type was 15%. In adenocarcinoma variety, the ratio between adenocarcinoma and adenosquamous cell carcinoma was 3:1. In most large series, about 90% of malignant lesions of cervix are squamous cell (Wentz 1959).

It is generally agreed that radical hysterectomy with pelvic lymph node dissection is done for stages Ia to IIa (Yu 1977). According to the so called Okabayashii procedure, only radiotherapy is used in advanced cancer including stages II, IV, and combined treatment such as surgery and radiotherapy is mainly used in stage IIa and IIb with positive lymph node findings at surgery.

The rate between surgery and radiotherapy was 1:0.42 over all stages which showed surgical procedure used more often than radiotherapy in Korea.

In developed countries such as Denmark, France, Japan and USA, the percentage of lymph node metastasis ranged from 1.6 to 13.6% in stage I and from 12.8 to 35.8% in stage II. The lowest percentage of lymph node metastasis is from Denmark (Roddick 1971).

In this study, it was very hard to get 5 year survival rates using data submitted from participating hospitals because of improper and short term follow-up. Accordingly the data of SNUH was presented in table 20. Comparison of 5 year survival rates between countries is shown in table 22.

Five year survival rates in stage I ranged from 81.1% to 87.8% in various countries (Masubuchi 1969). In stage II, 5 year survival rates ranged

from 64.2% to 78.2%. In our study, the 5 year survival rate was 90.6% in stage I, 75% in stage II and 26.3% in stage III. These rates were not significantly different from other countries in stage I and II, but significantly lower than those of China and Japan in stage III.

It is not always possible in the instances of patients who did not die in the hospital to discover the ultimate cause of death aside from cervical cancer (Zander 1981). Uremia with renal problem was the most common cause of death in our study.

## REFERENCES

- Aitken SJ.** Cancer of the uterine cervix in Aberdeenshire. Epidemiological aspects. *Br.J.Cancer* 1966, 20:624-632
- Barber HRK, Brunshwig A.** Gynecologic cancer complicating pregnancy. *Am. J. Obstet. Gynecol.* 1963, 85:156-163
- Boyd JT, Doll R.** A study of the etiology of carcinoma cervix uteri. *Brit. J. Cancer* 1964, 18:419-429
- Boyes DA, Worth AJ.** Cytological screening for cervical cancer: The cervix. Saunders WB, Philadelphia, 1976.
- Chang YS, Shin MW, Jin K.** Follow-up study on cervical cancer of Korean women. *Kor. J. Obstet. Gynecol.* 1984, 27:411-419
- Christopherson WM, Parker JE, Mendez wm, Lundin FE.** Cervix cancer, death rates and mass cytologic screening. *Cancer* 1970, 26:808-815
- Christopherson WM, Parker JE.** Relation of cervical cancer to early marriage and child bearing. *New Engl. J. Med.* 1965, 273:235-242
- Coppleson M, Reid B.** The etiology of squamous carcinoma of the cervix. Editorial, *Obstet. Gynecol.* 1968, 32:432-441
- Einhorn N, Patek E, Sjoberg B.** Outcome of different treatment modalities in cervix carcinoma stage Ib and IIa. *Cancer.* 1985, 55:949-956
- Fasal E, Simmons ME, Kampert JB.** Factors associated with high and low risk of cervical neoplasia. *J. Nat. Cancer Inst.* 1981, 66:631-639
- Gagnon F.** Contribution to the study of the etiology and prevention of cancer of the cervix of uterus. *Am. J. Obstet Gynecol.* 1950, 60:516-523
- Gagnon F.** The lack of occurrence of cervical carcinoma in nuns. *Proc. Second Natl. Cancer Conf.* 1952, 1:625-633
- Larsson G, Alm P, Gullberg B.** Prognostic factors in early invasive carcinoma of the uterine cervix. *Am. J. Obstet. Gynecol.* 1983, 146:145-149
- Maliphant RG.** Incidence of cancer of uterine cervix. *Brit. Med. J.* 1949, 1:978-985
- Martin CE.** Epidemiology of cancer of the cervix. Marital and coital factors in cervical cancer. *Am. J. Public heath* 1967, 57:803-812
- Martin CE.** Marital and coital factors in cervical cancer. *Am. J. obstet. Gynecol.* 1969, 103:566-573
- Masubuchi K.** Five year cure rate for carcinoma of the cervix uteri. *Am. J. Obstet. Gynecol.* 1969, 103:566-573
- Mikuta JJ.** Invasive carcinoma of the cervix in pregnancy. *South Med. J.* 1967, 60:843-851
- Orr JW, Wilson K, Bodiford C.** Corpus and cervix cancer: a nutritional comparison. *Am. J. Obstet. Gynecol.* 1985, 153:775-783
- Park TK.** Treatment failures in carcinoma of uterine cervix. An analysis and suggested therapeutic strategies. Tenth Asian and Oceanic Congress of Obstetrics and Gynecology, 1985.
- Pejovic MH, Wolff JP, Kramar A.** Cure rate estimation and long-term prognosis of uterine cervix carcinoma. *Cancer* 1981, 47:203-213
- Prick HC.** Management of noninvasive carcinoma of cervix. *Surgical Clinics of North America* 1978, 51(1);55-63
- Reagan JW.** Genesis of carcinoma of the uterine cervix. *Clin. Obstet. Gynecol.* 1967, 10:883-891
- Rha KY, Shin MW, Park JI.** Follow-up study and assessment of therapy on genital carcinoma of Korean women. *Kor. J. Obstet. Gynecol.* 1980, 23:19-40
- Roddick JW, Greenlaw RH.** Treatment of cervical cancer. *Am. J. Obstet. Gynecol.* 1971, 109:754-761
- Terris M, Wilson F, Smith H, Sprung E, Nelson JH.** The relationship of coitus to carcinoma of the cervix. *Am. J. Publ. Health* 1967, 97:804-850
- Towne JE.** Carcinoma of the cervix in nulliparous and celibate women. *Am. J. Obstet. Gynecol.* 1955, 69:606
- Ulfelder H, Smith CJ, Costello JB.** Invasive carcinoma of the cervix during prgnancy. *Am. J. Obstet. Gynecol.* 1967, 98:424
- Wakefield J, Yule R, Smith A.** Relation of abnormal cytologic smears and carcinoma of the uterine cervix to husband's occupation. *Brit. Med. J.* 1973, 2:142-150
- West RR.** Cervical cancer: age at registration and age at death. *Br. J. Cancer* 1977, 35:236-243
- Wentz WB, Reagan JW.** Survival in cervical cancer with respect to cell type. *Cancer* 1959, 12:384-391
- Yu HK.** The result in the treatment of cervical cancer in Japan. *Kor. J. Obstet. Gynecol.* 1977, 20:841-850
- Zander J, Baltzer J, lohe KJ.** Carcinoma of the cervix: An attempt to individualize treatment. *Am. J. obstet. Gynecol.* 1981, 139:752-760

=국문초록=

## 한국 여성의 자궁경부암 실태에 관한 연구

서울대학교 의과대학 산부인과학교실

신면우 · 조경훈

자궁경부암은 한국여성의 악성종양중 수위를 차지하고 있다. 그러나 자궁경부암의 전국적인 실태에 관하여는 아직 만족할 만한 보고가 없는 실정이다. 저자들은 1976년 1월부터 1982년 12월 까지 7년간 대한산부인과학회 산하의 전국 23개 병원에서 등록치료를 받은 2,277예의 자궁경부암환자를 대상으로 그 역학 및 치료에 관한 고찰을 통해 다음과 같은 결론을 얻었다.

1. 분석이 가능한 2,205예의 환자중, 임상 Ib기가 전체의 26%로 수위를 차지하고 있었다.
2. 연령분포는 40대가 865예(39%)이었고, 50대가 30%로 671례이었다.
3. 자궁경부암 환자의 88%가 24세 이전에 결혼을 했고, 과부인 경우 자궁경부암의 발생빈도가 현저하게 높았다.
4. 임신과 합병된 자궁경부암 환자는 88례(3.9%)이었다.
5. 질출혈이 가장 흔한 임상 증상이었고, 78% 환자는 세포진 검사, 87%가 자궁경부생검 그리고 21%의 환자는 콜포스코피에 의하여 진단되었다.
6. 조직학적으로는 편평상피세포암이 93.4%이었다.
7. 1234례(60%)에서 수술요법이 시행되었고, 417례(20%)의 환자가 방사선요법을 받았다.
8. 임상 Ib기에서의 임파선전이율은 16%이었다.
9. 5년 생존율은 임상I기에서 90.6%, II기에서 75%, 그리고 III기에서 26.3%이었다.