

The Epidemiology Of Uterine Cervix Cancer In Khon Kaen Province 1985-1987. First Result From A Population-Based Cancer Registry

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Abstract: This study was carried out to determine the accurate incidence and magnitude of problems of uterine cervix cancer in Khon Kaen province population. Under the methods of population-based cancer registry of Khon Kaen province, every case of uterine cervix cancer diagnosed from every health service center in Khon Kaen during the period from January 1,1985 to December 31,1987 was notified to the cancer unit, Faculty of Medicine, Khon Kaen University, both in passive and active methods. After careful check by computer and unit's staff, cases were recorded in computer for further study.

There were a total of 270 new cases of uterine cervix cancer reported in this three year period. The data showed it ranked first when compared with other female cancers. The crude incidence rates were 11.1,14.1 and 11.1 per 100,000 women per year for the years 1985,1986 and 1987 respectively. The age-standardized incidence rate, compared with standard world populations, were 14.8,20.7 and 16.1 per 100,000 per year for the years respectively for three years. The crude mortality rates were 2.2,1.3 and 0.8 per 100,000 per year for the years 1985,1986 and 1987 respectively. The age-standardized mortality rates, compared with standard world populations, were 3.7,1.9 and 0.7 per 100,000 per year for these years same. (Thai J Obstet Gynaecol 1989;1:39-46)

Key words: cervical cancer, epidemiology, cancer registry

Cancer is the third leading cause of death for Thais and is becoming a national health problem.⁽¹⁾ Cancer of the uterine cervix ranks first for all female

cancers in every part of the country.⁽²⁾ At present, there are no well established morbidity and mortality statistics for cervical cancer in Thailand. Most of

what is available are the relative frequencies from hospitals and institutes. This presentation is the first analysis based on the data from a population-based cancer registration.

Materials and Methods

Population at risk

Khon Kaen is one province situated in the northeast of Thailand, about 450 kilometers from Bangkok. It has a population of about 1.5 million, living in 20 districts located from about 30 to 150 kilometers from the city. The geographical and age distributions of the female population of Khon Kaen are shown in Tables 1 and 2. Most of them are Thai, Buddhist farmers with education only at primary school level. Their socio-economic status is low compared to other parts of the country.

Khon Kaen cancer registry

The Faculty of Medicine and Srinagarind Hospital, Khon Kaen University established a cancer unit, with one of its tasks the responsibility for cancer registration since 1984. The first hospital-based cancer registry was published in 1985 followed by annual reports up to 1987. The relative frequencies of cervical cancer at Srinagarind Hospital from the population-based cancer registry are shown in Table 3. The population-based cancer registry of Khon Kaen began on January 1, 1988 as a prospective data collection. The objectives of the registry are to collect, store, analyze and interpret the data on cancer occurring in Khon Kaen. Other objectives

Table 1 Geographical distribution of female population in all age, Khon Kaen Province 1985-1987 *

Districts	Years		
	1985	1986	1987
Muang	146299	147949	150564
Ban Phai	72575	73283	73949
Pol	41543	41202	41540
Chumpae	43226	58625	59939
Nam Pong	48588	48603	49578
Kranuan	40770	40303	42325
Puvien	50847	50821	51357
Nong Rua	40706	40550	41218
Chonnabot	24111	23880	24149
Munjakiri	45804	45815	46482
Nong Song Hong	33771	35001	32206
Wang Noi	19994	19598	19559
Sri Chompu	35429	35268	35729
Ubolratana	19029	18712	18992
Ban Phang	23881	23778	24174
Kao Saun Kwang	15159	15143	15528
Pra Yuen	15551	15344	15266
Wang Yai	13351	13375	13121
Puey Noi	9864	9421	9743
Puphaman	8949	9043	9150
Total	667200	763671	774569

*From Provincial Statistics

Table 2 Female population of Khon Kaen Province 1985-1987 age 20-79 *

Age	Years		
	1985	1986	1987
20-24	73000	73000	77600
25-29	58200	58200	59300
30-34	50000	50000	51600
35-39	42100	42100	43400
40-44	34800	34800	36100
45-49	29800	29800	30300
50-54	25400	25400	26000
55-59	19900	19900	20900
60-64	14900	14900	15500
65-69	10600	10600	11000
70-74	7300	7300	7400
75+	7300	7300	7500
All ages	667200	770800	783700

*From National Population Estimation

are to measure the incidence rates and long term cancer trends in Khon Kaen, set up the model for provincial population-based cancer registry in conjunction with the Thai National Cancer Institute for national cancer registration and assist in epidemiological research.

Table 3. Relative frequencies of cervical cancer at Srinagarind Hospital from hospital-based cancer registry

Year	Number of cases	Percentage of all female cancer	Percentage of all cancer
1984	255	35.19	19.38
1985	329	30.50	16.20
1986	416	32.00	16.40
1987	451	27.40	13.90

A case for the registry is defined as a malignant neoplasm not previously registered in any hospital or clinic. Exclusions were made for all premalignant diseases. All districts and regional hospitals including private clinics are requested to report new cancer cases to the cancer unit of Srinagarind Hospital. The cancer unit will then check the patients' names and identifications to be included or excluded as a new case. Death certificates will be checked at all hospitals, district offices and the central provincial office to compare with death certificates of Srinagarind Hospital and Khon Kaen Provincial Hospital.

Case-finding and diagnosis

In this study the personnel from the cancer unit of Srinagarind Hospital went out to every hospital in Khon Kaen including district and central provincial offices to collect data. All new cases and deaths occurring between January 1, 1985

and December 31, 1987 of residents in Khon Kaen were included in the study. All data were carefully checked with data from the hospital-based cancer registry of Srinagarind Hospital.

Statistical methods

Crude incidence and mortality rates for a certain year were obtained from the total number of cases and deaths of cervical cancer in each year compared to the total number of female population in Khon Kaen province per 100,000 women. Age-specific incidence and mortality rates were obtained from the number of new cases and deaths from cervical cancer in each age interval from 20 to 79 years. The rates were expressed per 100,000 women. Age-standardized incidence and mortality rates were obtained from the summation of the expected cases of occurrence in each age interval when compared to the standard world population in the same age group per 100,000. Case fatality rate of cervical cancer was obtained from the number of deaths from cervical cancer in each year divided by the total number of new cases in each year and was expressed in percent. Crude incidence and mortality rates for all districts in Khon Kaen were obtained from the total number of new cases and deaths for every district in each year compared to the female population for a certain district in a certain year.

Results

Incidence rates

Data for a total of 270 new cases

of cervical cancer were collected from all districts of Khon Kaen whose diagnosis were made between January 1,1985 and December 31,1987. Ages and yearly distributions of the cases are shown in Table 4. The age-specific incidence rates of cervical cancer in Khon Kaen from 1985 to 1987 are shown in Table 5. The crude incidence rates from 1985 to 1987 were 11.09, 14.14 and 11.10 per 100,000 respectively. The age-standardized incidence rates as compared to the standard world population for 1985 to 1987 were 14.75,20.68 and 16.07 per 100,000 respectively (Table 6).

Mortality rate

Death from cervical cancer for the Khon Kaen resident population from 1985 to 1987 were 17,10 and 6 respectively. Age distribution for fatal cases are shown in Table 7. The crude mortality rates from 1985 to 1987 are shown in Table 8 and were 2.2,1.3 and 0.8 per 100,000 respectively. The age-specific

Table 4. Age Distribution of cervical cancer patients in Khon Kaen Province 1985-1987. From population-based cancer registry

Ages	Years			Total
	1985	1986	1987	
20-24	0	1	0	1
25-29	2	1	3	6
30-34	3	9	10	22
35-39	10	9	7	26
40-44	13	14	16	43
45-49	11	24	17	52
50-54	12	26	11	49
55-59	5	14	6	25
60-64	7	6	7	20
65-69	5	2	6	13
70-74	5	2	2	9
75+	1	1	2	4
Overall	74	109	87	270

Table 5. Age-specific incidence rate of cervical cancer in Khon Kaen Province 1985-1987. From population-based cancer registry

Age groups	Years		
	1985	1886	1987
20-24	0.00	1.37	0.00
25-29	3.44	1.72	5.06
30-34	6.00	18.00	19.38
35-39	23.75	21.38	16.13
40-44	37.36	40.23	44.32
45-49	36.91	80.54	56.11
50-54	47.24	102.36	42.31
55-59	25.13	70.35	28.71
60-64	46.98	40.27	45.16
65-69	47.17	18.86	54.55
70-74	68.49	27.40	27.03
75+	13.70	13.70	26.67
CR*	11.09	14.14	11.10

CR* = Crude rate per 100,000 population per year

Table 6. Age-standardized incidence rate of cervical cancer in Khon Kaen province 1985-1987, compared to standard world population. From population-based cancer registry

Age groups	Expected cases		
	1985	1986	1987
20-24	0.00	0.14	0.00
25-29	0.27	0.14	0.40
30-34	0.36	1.08	1.16
35-39	1.43	1.28	0.97
40-44	2.24	2.41	2.65
45-49	2.21	4.83	3.37
50-54	2.36	5.12	2.12
55-59	1.01	2.81	1.15
60-64	1.88	1.61	1.81
65-69	1.42	0.57	1.64
70-74	1.37	0.55	0.54
75+	0.21	0.14	0.27
ASR*	14.75	20.68	16.07

ASR* = Age-standardized incidence rate per 100,000 population per year (Compared to standard world populations)

mortality rate are also shown in Table 8. Table 9 shows the age-standardized mortality rates of cervical cancer from 1985 to 1987 when compared to the standard world population, which were 3.7,1.9 and 0.7 per 100,000 respectively.

Case fatality rates were computed and revealed as 22.97%, 9.17% and 6.90% respectively. Table 10 summarizes the incidence and mortality rates of cervical cancer in Khon Kaen from 1985 to 1987.

Table 8. Age-specific mortality rate of cervical cancer in Khon Kaen Province 1985-1987. From population-based cancer registry

Age groups	Years		
	1985	1986	1987
20-24	0.00	0.00	0.00
25-29	0.00	0.00	0.00
30-34	2.00	0.00	0.00
35-39	2.38	2.38	0.00
40-44	8.62	0.00	5.54
45-49	0.00	6.71	0.00
50-54	11.81	23.62	3.85
55-59	5.03	5.03	4.78
60-64	33.56	0.00	6.45
65-69	9.43	0.00	9.09
70-74	27.40	0.00	0.00
75+	0.00	0.00	0.00
All Ages	2.21	1.30	0.77

Table 9. Age-standardized mortality rate of cervical cancer in Khon Kaen Province 1985-1987, compared to standard world population. From population-based cancer registry.

Age groups	Years		
	1985	1986	1987
20-24	0.00	0.00	0.00
25-29	0.00	0.00	0.00
30-34	0.12	0.00	0.00
35-39	0.14	0.14	0.00
40-44	0.51	0.00	0.33
45-49	0.00	0.40	0.00
50-54	0.59	1.18	0.19
55-59	0.20	0.20	0.19
60-64	1.34	0.00	0.00
65-69	0.28	0.00	0.00
70-74	0.55	0.00	0.00
75+	0.00	0.00	0.00
ASMR*	3.74	1.94	0.72

ASMR* = Age-standardized mortality rate per 100,000 population per year (Compared to standard world population)

Geographical rates

Table 11 shows the geographical distribution of cervical cancer from 1985 to 1987 and Table 12 shows the crude incidence rates of those. Tables 13 and

Table 10. Morbidity and mortality statistics of cervical cancer in Khon Kaen Province 1985-1987

Statistic*	Years		
	1985	1986	1987
Crude incidence	11.09	14.14	11.10
Age-standardized incidence	14.75	20.68	16.07
Crude-mortality	2.21	1.30	0.77
Age-standardized mortality	3.74	1.94	0.72
Case fatality rate	22.97	9.17	6.90

* All figures are shown in the rates per 100,000 population per year, except for case fatality rate that is show in per cent.

Table 11. Geographical distributions of cervical cancer in Khon Kaen Province 1985-1987

Districts	Number of patients by years			Total
	1985	1986	1987	
Muang	23	32	22	77
Ban Phai	9	11	4	24
Pol	3	11	5	19
Chumpae	6	5	11	22
Nam Pong	3	9	6	18
Kranuan	2	0	5	7
Puvieng	4	4	4	12
Nong Rua	4	3	7	14
Chonnabot	4	7	0	11
Munjakiri	2	4	2	8
Nong Song Hong	3	4	2	9
Wang Noi	2	1	1	4
Sri Chompu	3	4	5	12
Ubolratana	1	2	2	5
Ban Phang	1	6	3	10
Kao Saung Kwang	0	0	1	1
Pra Yuen	1	2	2	5
Wang Yai	2	3	1	6
Puey Noi	0	1	2	3
Puphaman	1	0	2	3
Total	74	109	87	270

14 show the crude death rates in different districts.

Race, religion and marital status

Table 15 shows that 94.81 % of the patients were Thai, 95.56% of those were Buddhists (Table 16) and 98.52 % of the cases were married (Table 17).

Staging of Disease

From the available data, 13.97 % of the cases were in stage I, while 48.90 % of those were in stage II and III, 4.04 % were in stage IV and 33.09 % could not be staged or the data were missed (Table 18).

Histology

Table 19 shows the different histological types of cancer of which the most

Table 12. Crude incidence rate of cervical cancer in Khon Kaen Province 1985-1987. Geographical distributions

Districts	Years		
	1985	1986	1987
Muang	15.72	21.63	14.61
Ban Phai	12.40	15.01	5.41
Pol	7.22	26.70	12.04
Chumpae	13.88	8.53	18.35
Nam Pong	6.17	18.52	12.10
Kranuan	4.91	0.00	11.81
Puvieng	7.86	7.87	7.79
Nong Rua	9.83	7.40	16.98
Chonnabot	16.59	29.31	0.00
Manjakiri	4.37	8.73	4.30
Nong Song Hong	8.88	11.43	6.21
Wang Noi	10.00	5.10	5.11
Sri Chompu	8.47	11.34	13.99
Ubolratana	5.26	10.69	10.53
Ban Phang	4.19	25.23	12.41
Kao Suan Kwang	0.00	0.00	6.44
Pra Yuen	6.43	13.03	13.10
Wang Yai	14.98	22.23	7.62
Puey Noi	0.00	10.61	20.53
Puphaman	11.17	0.00	21.86
Overall	11.09	14.27	11.23

Table 13. Death from cervical cancer in 20 districts of Khon Kaen Province 1985-1987. From population-based cancer registry

Districts	Death by years			Total
	1985	1986	1987	
Muang	2	3	1	6
Ban Phai	3	1	0	4
Pol	0	1	0	1
Chumpae	1	1	0	2
Nam Pong	1	2	2	5
Kranuan	0	0	0	0
Puvieng	1	0	0	1
Nong Rua	1	1	3	5
Chonnabot	1	0	0	1
Munjakiri	2	1	0	3
Nong Song Hong	2	0	0	2
Wang Noi	0	0	0	0
Sri Chompu	2	0	0	2
Ubolratana	0	0	0	0
Ban Phang	0	0	0	0
Kao Suan Kwang	0	0	0	0
Pra Yuen	1	0	0	1
Wang Yai	0	0	0	0
Puey Noi	0	0	0	0
Puphaman	0	0	0	0

Table 14. Crude mortality rate of cervical cancer in Khon Kaen Province 1985-1987. Geographical distributions

Districts	Years		
	1985	1986	1987
Muang	1.37	2.03	0.66
Ban Phai	4.13	1.36	0.00
Pol	0.00	2.43	0.00
Chumpae	2.31	1.71	0.00
Nam Pong	2.06	4.12	4.03
Kranuan	0.00	0.00	0.00
Puvieng	1.97	0.00	0.00
Nong Rua	2.46	2.47	7.28
Chonnabot	4.15	0.00	0.00
Munjakiri	4.37	2.18	0.00
Nong Song Hong	5.92	0.00	0.00
Wang Noi	0.00	0.00	0.00
Sri chompu	5.68	0.00	0.00
Ubolratana	0.00	0.00	0.00
Ban Phang	0.00	0.00	0.00
Kao Suan Kwang	0.00	0.00	0.00
Pra Yuen	6.43	0.00	0.00
Wang Yai	0.00	0.00	0.00
Puey Noi	0.00	0.00	0.00
Puphaman	0.00	0.00	0.00

Table 15. Races of cervical cancer patients in Khon Kaen province 1985-1987. From population-based cancer registry

Race	Number of cases	Percent
Thai	256	94.81
Chinese	3	1.11
Others	1	0.37
Missing data	10	3.71

Table 16. Religions of cervical cancer patients in Khon Kaen Province 1985-1987. From population-based cancer registry

Religions	Number of cases	Percent
Buddhism	258	95.56
Christian	1	0.37
Muslim	1	0.37
Missing data	12	3.70

Table 17. Marital status of cervical cancer patients in Khon Kaen Province 1985-1987. From population-based cancer registry

Marital status	Number of cases	Percent
Single	4	1.48
Married	266	98.52

Table 18. Stages distribution of cervical cancer patients in Khon Kaen Province 1985-1987. From population-based cancer registry

Stages	Number of cases	Percent
Stage I	38	13.97
Stage II&III	133	48.90
Stage IV	11	4.04
Unknown	88	33.09

common were squamous cell, large cell non-keratinized type (47.41 %).

Discussion

Most of statistics concerning cervical cancer in Thailand were the relative frequencies of tumors. The data were

obtained from cases diagnosed and treated at certain hospitals or institutes. This was the first report of which data were obtained from population-based collection. The interpretation of this data should be done cautiously because this preliminary report was done retrospectively. Underestimation might have occurred because of who had cancer and died at home without notifying the underlying cancer diseases at death certificates. Those who had cancer and went

Table 19. Pathology of cervical cancer in Khon Kaen Province 1985-1987. From population-based cancer registry.

Pathology	Cases	Percent
SCC,K,NOS	16	5.93
SCC,Large Cell,NK	128	47.41
SCC,Small Cell,NK	10	3.70
SCC Grade I	2	0.74
SCC Grade II	1	0.37
SCC Grade III	2	0.74
SCC,NOS	44	16.30
Adeno CA Grade I	4	1.48
Adeno CA Grade III	1	0.37
Adeno CA,NOS	15	5.56
Adenosquamous CA.	2	0.74
Papillary Adeno CA, NOS	1	0.37
Mucin-Producing Adeno CA	1	0.37
Undiff CA, NOS	2	0.74
No Microscopic Confirmation	41	15.19
Total	270	100.00

for diagnosis and treatment in Bangkok without referring back to Khon Kaen might also have been lost from the investigation.

The age-standardized incidence rates obtained from this study were comparable to those of other countries⁽³⁾ (Table 20). The incidence and mortality rates of Khon Kaen were in the middle of those. Eventhough the incidence rates fluctuated during the three year period, mortality rates were observed to be de-

Table 20. Incidence of cervical cancer in Khon Kaen province compared with selected countries in the world

Country	Registry*	ASR**
Brazil	Sao Paulo	35.1
Canada	Ontario	9.9
China	Shanghai	8.5
Hong Kong	Hong Kong	23.7
India	Bombay	20.6
India	Bangalore	40.2
Israel	Israel	4.0 (All Jews) 5.1 (Born Israel) 3.0 (Non-Jews)
Japan	Osaka	16.0
Japan	Hiroshima	22.0
Philippines	Rizal	16.6
Poland	Warsaw	14.7
Singapore	Singapore	17.0 (Malay) 9.9 (Indian) 28.0 (Indian)
United Kingdom	Birmingham	12.3
U.S.A.	Atlanta	8.5 (White) 18.9 (Black)
Thailand	Khon Kaen	17.2

*Approved By International Agency For Research On Cancer (WHO).

ASR** = Age-Standardized Incidence Rate.

creasing. This may be due to the mass screening for cervical cancer in Khon Kaen during the period from October 13 to October 17, 1986⁽⁴⁾ and the continuous screening program since 1976.

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