RESEARCH COMMUNICATION

Ethnic and Age Variation of Cancer of the Reproductive System in Women of Kyrgyzstan

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Abstract

The purpose of this research was to assess the ethnic and age variation in the incidence rates of cancer of the female reproductive system (cancers of the breast, cervix uteri, corpus uteri and ovaries) in Kyrgyzstan. A retrospective approach was adopted covering the period from 1995 to 2002 with descriptive and analytical methods to estimated incidence rates in women of Russian and Kyrgyz nationalities. Values were found to be higher in Russian women but decreasing over time, while increase was observed for the Kyrgyz. Breast cancers were most common in Russian women and in their Kyrgyz counterparts cancer of the cervix uteri predominated. The data reveal age and ethnic variation in cancer localization.

Key words: Breast cancer - corpus uteri cancer - cervix uteri cancer - ovary cancer - incidence rates

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Introduction

Epidemiological studies of malignancies of the female reproductive system (breast , cervix uteri, corpus uteri and ovarian cancers) have shown that their dissemination worldwide is not even (Parkin et al, 1999; IARC, 2001), connected with different exogenic and endogenic factors which influence disease development risk (Tleuf, 1970; Gutman, 1973; Kanunnikova, 1978; Seviglazov 1983; Levshin 1986; Sizikov, et al 1988). Both ethnic background and age of the patient are of importance.

Different ethnical groups have their own customs, traditions, habits and native female habitants of the Central Asia, the Zabaikalye, in comparison to women of Russian nationality living in the same regions, start their sexual life much earlier, more rarely use contraceptives or undergo abortions, give a birth to their first children at younger ages and have more numerous childbirths. Furthermore, in regions with high incidence rates of cancer, factors related to disordered functioning of female genitals and breast may prevail (Lejava et al., 1970; Medvedev, 1972; Esenkulov, 1989; Kamarli et al., 1991).The risk of having a malignant tumors increases proportionally with age, but age incidence rates in different parts of the world vary (Makimbetov et al., 2003).

The present research was conducted to assess the impact of ethnicity and age on cancer of the reproductive system in women of Kyrgyzstan.

Materials and Methods

Documents of the National Oncology Center under the Ministry of Health of Kyrgyz Republic for patients who were, for the first time in their lives, diagnosed with breast cancer, cervix uteri cancer, corpus uteri cancer and ovarian cancer were utilised for the 8 years from 1995 to 2002. In this period, a total of 6861 patients were registered. The data of the National Statistical Committee of the Kyrgyz Republic were assessed for the same period for population size.

Using generally accepted methods (Merkov et al., 1974; Glantz, 1999) the following were estimated:

1. ER (extent rates) = (n*100%)\N, where n is the number of cases.

2. CR (crude rates) = (n*100,000)\N, where n is the number of cases, and N is the average population size.

3. Standardized incidence rates by means of the direct method, with the standard population of the world.

4. Disease dynamics during the 8 years, and trends determined by means of the least square method: y=a+bx, where y is an aligned incidence rate, x – conditional number, that is symmetrical in regard to zero, a – conditional average, b – alignment coefficient. Incidence rate increase and decrease were estimated with comparison of the years 1995 and 2002 (L, $^{0}/_{0000}$).

5. Average age of patients and average annual growth rate (T_{in}, %).

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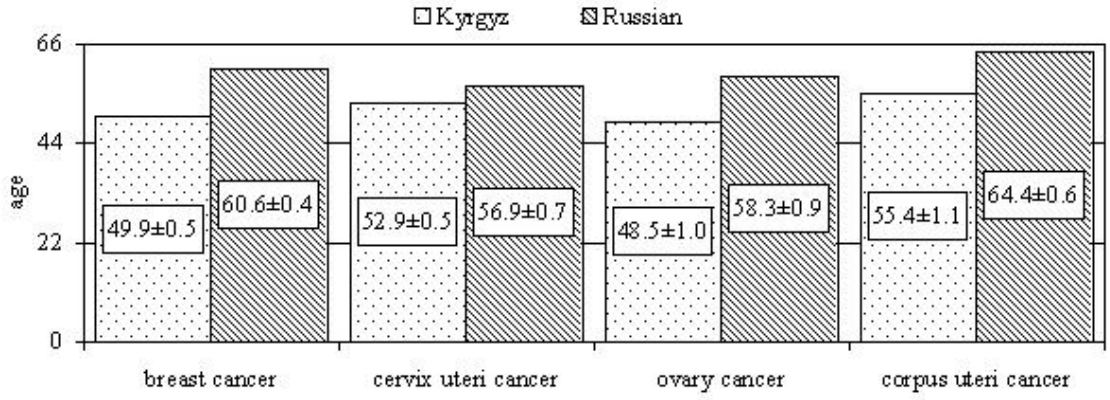

Figure 1. Average Age of Female Patients with Cancer of the Reproductive System in Kyrgyzstan

For statistical analysis, the Student's t test was used and p values estimated with a Biostatistics program for Windows (Version 4.03 by Stanton Glantz).

Results and Discussion

According to the Rosset's classification (Rosset, 1968), the population of Kyrgyzstan is demographically young. From the First National Census of the year 1999, the majority of the female population were under 30 (61.4%), while a women above 60 years old accounted for only 9.3 % (The population of Kyrgyzstan, 1999). The Census covered 2,442,474 women, and 77.5 % were Kyrgyz (64.0%) or Russian women (13.5%). The age structure for the Kyrgyz women was progressive, while for the Russians it was regressive. Kyrgyz females thus were predominately young and the Russians relatively old (Table 1).

Of the 6861 patients with cancer of the reproductive system registered throughout the country, 80.5% were women of Kyrgyz and Russian nationalities (see Table 2). The average ages of patients of Kyrgyz and Russian nationalities were 51.4±0.4 and 60.1±0.5 years old, the difference being statistically significant ($p<0.001$). With all forms of cancer researched, Russian female patients were older ($p<0.001$), than their Kyrgyz counterparts (Figure 1).

Table 1. Age Structure (%) of the Female Population of Kyrgyzstan according to the Census of 1999

Age group	Nationality		
	Kyrgyz	Russian	All
00-29	66.9	39.1	61.5
30-39	14.6	12.3	14.3
40-49	8.7	15.1	10.0
50-59	3.4	10.5	4.8
60-69	3.6	11.9	5.1
70 +	2.8	11.1	4.3
00-14	38.8	17.6	34.9
15-49	51.4	48.9	50.9
50 +	9.8	33.5	14.2

Average annual gross incidence rates of malignant tumor of the reproductive system in Kyrgyz women is $20.6\pm1.0^0/_{0000}$ and $-116.8\pm3.7^0/_{0000}$ in Russian women. The incidence rates differences were statistically significant. In dynamics, disease incidence rates tended to increase (T_{in}=+5.8%), the increase was fixed when was made a leveling of rates (L=+6.31). As for the Russian women, average annual rates of the decrease amounted to 99.9% (T_{in}=-0.4%), and leveling rates decreased to $4.45^0/_{0000}$.

Standardized incidence rates of cancer of the reproductive system, in general, during the mentioned period, in Kyrgyz women was higher, than the gross incidence rates and amounted to 32.4±1.5, and increased in dynamics (T_{in}=+5.3%, L=+8.21).

Standardized incidence rates of cancer of the reproductive system in Russian women, as well as the gross rate have been decreasing (T_{in}=-0.4%, L=-6.43), and average annual incidence rate amounted to $79.4\pm2.7^0/_{0000}$, i.e., it was lower than the gross rate.

In Kyrgyz women, a standardized incidence rates on individual forms of cancer were higher, than the gross incidence rates, while in Russian women these incidence rates were lower. Incidence rates of all forms of cancer are being researched, in Russian women, were higher and its statistically significant (Table3).

Standardized incidence rates of the forms of cancer being researched in Kyrgyz women tended to increase. Leveling

Table 2. Malignant Tumors of the Female Reproductive System for the Period from 1995-2002

Nationality	Breast		Cervix Uterus		Ovary		Corpus Uterus		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%
Kyrgyz	860	28.9	1082	52.4	424	42.4	209	25.5	2575	37.5
Russian	1464	49.1	618	30.0	417	41.8	449	54.8	2948	43.0
Others	655	22.0	363	17.6	158	15.8	162	19.7	1338	19.5
Total	2979	100.0	2063	100.0	999	100.0	820	100.0	6861	100.0

Table 3. Average Annual Incidence Rates of Cancer of the Reproductive System in Women of Individual Nationalities of Kyrgyzstan for 8 Years (1995-2002)

Nationality	Breast		Cervix Uterus		Ovary		Corpus Uterus	
	CR	SR	CR	SR	CR	SR	CR	SR
Kyrgyz	6.9±0.5	10.6±0.8	8.7±0.3	13.8±0.4	3.4±0.3	5.1±0.4	1.7±0.2	2.9±0.3
Russian	57.9±2.4	39.1±1.6	24.5±1.2	17.4±0.9	16.5±1.2	11.6±1.0	17.8±0.5	11.2±0.4
	t=16.2	t=13.1	t=16.0	t=4.2	t=10.7	t=6.1	t=21.6	t=13.4
	p=0.000	p=0.000	p=0.000	p=0.000	p=0.000	p=0.000	p=0.000	p=0.000

CR, crude rate, SR, standardized rate

Table 4. Dynamics of the Standardized Incidence Rates of Cancer of the Reproductive System in Kyrgyz Women of Kyrgyzstan for 8 Years (1995-2002)

Localization	Rate	Year								Dynamics
		1995	1996	1997	1998	1999	2000	2001	2002	
Breast	SR	7.4	10.7	9.6	8.8	9.1	12.1	13.3	13.5	T_{in}=+8.9%
	LSR	7.9	8.7	9.4	10.2	10.9	11.7	12.5	13.2	L=+5.31
Cervix Uterus	SR	12.5	14.6	15.3	13.7	12.3	12.8	14.5	14.7	T_{in}=+2.4%
	LSR	13.6	13.6	13.7	13.8	13.9	13.9	14.0	14.1	L=+0.52
OC	SR	4.4	3.7	5.9	5.8	4.4	5.1	4.3	7.0	T_{in}=+6.8%
	LSR	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.8	L=+1.44
CoUC	SR	3.2	2.4	2.8	3.2	1.6	2.3	3.6	4.3	T_{in}=+4.5%
	LSR	2.5	2.6	2.7	2.9	3.0	3.1	3.3	3.4	L=+0.94

SR, standardized rate, LSR, leveling standardized rate

Table 5. Dynamics of the Standardized Incidence Rates of Cancer of the Reproductive System in Russian Women of Kyrgyzstan for 8 Years (1995-2002)

Localization	Rate	Year								Dynamics
		1995	1996	1997	1998	1999	2000	2001	2002	
BC	SR	36.6	38.2	41.3	45.7	36.7	36.5	44.2	33.8	T_{in}=-1.1%
	LSR	39.6	39.5	39.3	39.2	39.0	38.9	38.7	38.6	L=-1.05
CeUC	SR	18.1	19.3	17.1	19.4	12.2	16.8	18.5	18.0	T_{in}=-0.1%
	LSR	18.0	17.8	17.7	17.5	17.4	17.2	17.1	16.9	L=-1.08
OC	SR	12.0	13.4	14.1	15.7	9.2	9.6	8.3	10.8	T_{in}=-1.5%
	LSR	13.9	13.3	12.6	12.0	11.3	10.7	10.0	9.4	L=-4.51
CoUC	SR	11.1	11.4	11.5	11.6	11.0	10.6	9.8	13.0	T_{in}=+2.4%

SR, standardized rate, LSR, leveling standardized rate

of the standardized incidence rates also has shown the increase of the rates (Table 4). It should be mentioned, that a high rates of increasing were in breast cancer (T_{in}=+8.9%, L=+5.31).

Analysis of the standardized incidence rates and their leveling had shown that, incidence rates of individual forms of cancer in Russian women tended to decrease, except for incidence rates of the uterine body cancer in which rates tended to increase (T_{in}=+2.4%, L=+0.22) (Table 5). An intense decrease of incidence rates of the ovarian cancer is shown in the table (T_{in}=-1.5%, L=-4.51).

According to the analysis of cancer of the reproductive system in women of Kyrgyzstan on basis of ethnic belong it has been determined that, the highest incidence rates were in women of Russian nationality. In addition, an incidence rates level of all forms of cancer being researched in Russian women were higher, than in their Kyrgyz counterparts. Here is a speculation on how ethnic belong influences on incidence rates in different age groups as well as of cancer of the reproductive system and of individual localization.

In the beginning we have to assess the age incidence rates of cancer of the reproductive system, in general. The incidence rates in Russian women under 30 were higher, than in Kyrgyz women, and it amounted to $5.2\pm1.0^{0}/_{0000}$ and $1.6\pm0.2^{0}/_{0000}$, accordingly. The difference statistically is significant (t=5.3, p=0.000).

As for the age group 30-39 years, incidence rates increased and amounted to $62.5\pm3.9^{0}/_{0000}$ in Russian women and $25.7\pm1.6^{0}/_{0000}$ - in Kyrgyz women.

In age group 40-49 years, the incidence rates in Russian women were higher to 2.3 than in Kyrgyz. The difference was statistically significant (t=7.5, p=0.000), and incidence

rates amounted to 162.7±11.3$^0/_{0000}$ and 71.8±6.0$^0/_{0000}$, accordingly.

In Kyrgyz women of the age group 50-59 years had been marked a peak of the incidence rates of cancer of the reproductive system and amounted to 107.4±5.7$^0/_{0000}$. The level of the incidence rates in Russian women ((233.7±6.2$^0/_{0000}$) was higher to 2.2, than in Kyrgyz women (t=14.5, p=0.000).

In the age group 60-69 years, the incidence rates in Russian women reached a maximum point 280.0±11.0$^0/_{0000}$, and in Kyrgyz women (95.1±7.2$^0/_{0000}$) in comparison to previous age group the incidence rates tends to decrease. The incidence rates ratio in Kyrgyz and Russian women amounted to 3:1 (t=11.3, p=0,000).

At the age of 70 and older, the incidence rates in women of Russian nationality (221.5±12.7$^0/_{0000}$) were also higher, than in Kyrgyz (86.0±7.8$^0/_{0000}$) and the difference was statistically significant (t=7.2, p=0.000).

The age incidence rates in women of Kyrgyz and Russian nationalities on individual localization are shown in table 5. As it is seen from the table, age incidence rates in Russian women were statistically significant and higher, than in Kyrgyz women in regard to breast cancer and ovarian cancer. The incidence rates peak of the breast cancer in women of Kyrgyz nationality was determined at the ages of 50-59 (36.8±3.3$^0/_{0000}$), and in Russian women at the ages of 60-69 (131.7±8.5$^0/_{0000}$). A maximum incidence rates of the ovarian cancer in Russian and Kyrgyz women were determined in the age group 60-69 years, and the incidence rates amounted to 37.8±2.5$^0/_{0000}$ and 17.0±2.3$^0/_{0000}$, accordingly.

Analysis made in regard to the incidence rates of the cervix uteri cancer in Kyrgyz and Russian women has not revealed any differences (that are statistically significant) in the age groups 50-59years, 60-69 years, at the age 70 and older (Table 6). But, there were no any statistically significant differences of the incidence rates between Kyrgyz and Russian women in the young age groups – under 30 years old and 30-39. In other age groups had been revealed a differences of the incidence rates of the cervix uteri cancer and corpus uteri cancer in Kyrgyz and Russian women.

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Table 6. Average Annual Incidence Rates of Tumors of the Reproductive System in Women of Individual Nationalities in Kyrgyzstan for 8 Years (1995-2002)

Age group	Nationality	Localization			
		BC	CeUC	OC	CoUC
00-29	Kyrgyz	0.4±0.1	0.5±0.1	0.8±0.1	0.05±0.03
	Russian	1.3±0,3	1.8±0.6	1.8±0.6	0.20±0.10
	statistical significance	t=3.6, p=0.000	t=3.0, p=0.004	t=2.8, p=0.007	t=1.8, p=0.120
30-39	Kyrgyz	10.2±1.2	10.7±0.5	3.6±0.7	1.2±0.2
	Russian	29.9±3.6	21.0±3.6	9,7±1.9	2.0±0.9
	statistical significance	t=6.5, p=0.000	t=4.6, p=0.000	t=3.7, p=0.000	t=1,4, p=0.187
40-49	Kyrgyz	27.6±2.7	28.9±2.4	9.8±1.1	5.5±1.2
	Russian	80.2±3.8	44.6±5.0	23.8±5.1	14.1±1.3
	statistical significance	t=11.3, p=0.000	t=3.2, p=0.001	t=3.0, p=0.004	t=4.9, p=0.000
50-59	Kyrgyz	36.8±3.3	43.8±1.8	14.3±2.5	12.5±1.8
	Russian	126.4±6.3	36.7±4.1	30.9±3.6	39.7±2.8
	statistical significance	t=9.4, p=0.000	t=1.8, p=0.068	t=3.5, p=0.000	t=6.6, p=0.000
60-69	Kyrgyz	22.3±2.1	46.5±5.6	17.0±2.3	9.3±1.8
	Russian	131.7±8.5	51.9±5.5	37.8±2.5	58.5±3.5
	statistical significance	t=6.4, p=0.000	t=0.7, p=0.501	t=5.8, p=0.000	t=6.7, p=0.000
70 +	Kyrgyz	23.9±4.0	39.9±4.1	14.0±2.3	8.2±1.4
	Russian	114.0±8.9	39.9±5.4	29.6±2.9	37.9±2.3
	statistical significance	t=5.2, p=0.000	t=0.000, p=1.0	t=3.8, p=0.000	t=6.6, p=0.000

Note: BC, breast cancer, CeUC, cervix uteri cancer, OC, ovary cancer, CoUC, corpus uteri cancer

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It has been determined a reverse correlative connection between a female population density of the mentioned nationalities and the age incidence rates of cancer of the reproductive system. So, the connection of the age structure of population with incidence rates of cancer of the reproductive system, in general, was found in Kyrgyz women r=-0.842±0.016 and r=-0.745±0.023 in Russian women. The same connection was determined in researching of the other forms of cancer. Correlation ratio in Kyrgyz and Russian women with breast cancer amounted to r=-0.823±0.031 and r=-0.754±0.032, accordingly; r=-0.833±0.026 and r=-0.804±0.040 - with cervix uteri cancer; r=-0.805±0.048 and r=-0.751±0.060 - with ovarian cancer, r=-0.737±0.090 and r=-0.582±0.088 - with corpus uteri cancer. Correlation ratio has been assessed as intense (except for Russian women with corpus uteri cancer), i.e. the lower a population density, the higher the incidence rates of the mentioned forms of cancer with aging.

Conclusions

On basis of the analysis of the incidence rates of cancer of the reproductive system has determined that, the Russian women have become sick most often, than their Kyrgyz counterparts (p=0.000). The same picture has been observed in patients with other forms of cancer. In the structure of malignant tumors of the reproductive system in Russian women, breast cancer was on the first place, cervix uteri cancer took the second place, ovarian cancer – was on the third place and corpus uteri cancer – on the fourth place. As for the Kyrgyz women, breast cancer was on the second place, and on the first – cervix uteri cancer.

Standardized incidence rates of cancer of the reproductive system in Kyrgyz women was higher, than the gross incidence rates, while in Russian women has been observed an opposite scene. In dynamics, the gross and the standardized incidence rates of cancer of the reproductive system has shown a different tendency, i.e. in Kyrgyz women has been observed an increase, while in Russian – decrease. Process of leveling had proved this normality.

Analysis of the incidence rates of breast cancer has shown a peak of the rates on Kyrgyz women in the age group 50-59 years and in Russian women at the ages of 60-69. In Kyrgyz women, the peak of the incidence rates was in the age group 60-69 years, and in Russian women have been determined two peaks: the first one in the age group 40-49 years and the second – in the age group 60-69 years. In Kyrgyz and Russian women with ovarian cancer the peak was in the age group 60-69 years. As for the cervix uteri cancer, maximum incidence rates in Kyrgyz women were in the age group 50-59 years and in Russian women in the age group 60-69 years.

It has been determined that, age incidence rates in women of Russian nationality were statistically higher, than in Kyrgyz women in all forms of cancer being researched. An exceptions were the incidence rates in patients at the age of 50 and older with cervix uteri cancer and patients under 40 years old with corpus uteri cancer, and there were no any statistically significant differences between Kyrgyz and Russian women.

So, the impact of ethnic factor on incidence rates of malignant tumor of the reproductive system in different age groups has become obvious.

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