TOPICAL ISSUE

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MORTALITY AND LOST YEARS OF LIFE (YLL) DUE TO BREAST, CERVICAL, AND OVARIAN CANCER IN THE REPUBLIC SAKHA (YAKUTIA) IN 2006-2016

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Introduction: Breast, cervical, and ovary cancer are the most common caused-of death cancer in women population in the world, so does in Russia. This study aims to depict breast, cervical, and ovary cancer mortality and years of life lost (YLL) trends in the Republic of Sakha (Yakutia) in the period 2006-2016.

Methods: Data were obtained through the database of the Republic of Sakha (Yakutia) federal state statistics service (Rosstat) which included with ICD-10 code for cause of death.

Results: There were 11.1% deaths caused by breast cancer, 6.9% by cervical cancer, and 4.6% caused by ovary cancer from all death caused by cancer in women population in the research period. YLL from those cancers respectively were 9032, 7796, and 4545 life years. Average years of life lost (AYLL) of those cancers were 13.4; 20.1; and 16.2 life years.

Conclusion: Mortality, YLL, and AYLL due to breast and ovary cancer decreased when those variables increased in cervical cancer. Based on YLL, cervical cancer is now leading to a greater number of deaths among younger generations of women in the Republic of Sakha (Yakutia). Breast cancer remains the dominant cause of cancer death.

Keywords: breast cancer, cervical cancer, ovary cancer, cancer in women, YLL, AYLL, mortality from malignant neoplasms, Republic of Sakha (Yakutia).

Introduction. Breast cancer becomes the second death-leading cancer in the world with 2.088.849 new cases and 626.679 deaths in 2018 when cervical cancer and ovary cancer also in the top list of death-leading cancer. Breast, cervical, and ovary cancer are the most common female malignancy cancer types causing death even though they are preventable [6, 10].

Different from breast cancer which incidence and mortality rate are higher in high-income countries, cervical cancer has higher prevalence in poor countries when prevalence of ovary cancer has almost the same regardless of the income of the countries [5].

In 2012, 528 000 new cases with 266.000 death of cervical cancer in women were diagnosed worldwide. 85% of the cases were in low-income countries. Breast cancer and ovary cancer are in the list of leading-to death cancer with 20 and 6.8 death per 100000 women respectively in America 2016 [8].

In Iran, years of life lost from breast and ovary cancer are 94.216 and 26.430 life-years respectively. Premature mortality costs from those cancers are 149.933.799 and 38.398.286 US dollars [13].

In Norway, Average years life lost of cervical cancer is the highest among other cancer most frequent cancer in women (25 life years) when AYLL of ovary cancer is slightly higher than AYLL of breast cancer (around 16 life years) [6].

Breast, cervical, and ovary cancer are also problems in Russia and Republic of Sakha (Yakutia) [1, 2, 3]. Breast cancer average annual age-standardized incidence (ASIRs) was 41,8 per 100000 women in 2004-2008 and the value increased to 45,6 per 100000 women in 2009-2013. Lower than breast cancer in both of those periods, ASIRs of cervical cancer was 12,3 and increased to 13,8 per 100000 women [4].

This study aims to depict breast, cervical, and ovary cancer mortality and years of life lost (YLL) trends in the Republic of Sakha (Yakutia) in the period 2006-2016.

Materials and Methods. This study is about Years of Life Lost (YLL) of breast, ovary, and cervical cancer in women aged equal or more than 18 years old in Republic of Sakha (Yakutia) in period 2006-2016.

Data was taken from Russian federal state statistics service (Rosstat). The data was provided with ICD-10 diagnosis to categorize group of calculated disease. We then filtered the mortality caused by breast cancer (C50),), and cervical cancer (C53), and ovary cancer (C56).

The following formula was used to calculate individual YLL [10]:

YLL individual = End point − Age at death

Where: YLL = Years of Life Lost

End point = Life expectancy of the population

Age of death = Age of death of individual

Life expectancy of the population data was taken from federal state statistic service record of Republic of Sakha (Yakutia).

The average YLL (AYLL) was calculated by using formula:

$$AYLL = \frac{\text{Всего } YLL}{\text{Общее количество смертей от рака среди женщин в } 2006-2016 \text{ гг}}$$

Results and Discussion. In the period 2006-2016, there were 763 (11,1%) deaths caused by breast cancer, 387 (6,9%) deaths from cervical cancer, and 280 (4,6%) deaths from ovary cancer from all death caused by cancer in women population. From those numbers of deaths, Years of Life Lost (YLL) from breast cancer were 9032 (13,5%) life years, 7796 (11,6%) life years from cervical cancer, and 4545 (6,8%) life years from ovary cancer. Average Years of Life

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Lost (AYLL) of breast cancer was 13,4 life years, cervical cancer was 20,1 life years, and ovary cancer was 16,2 life years.

The death rate of breast cancer decreased from 14,1 to 9,3 per 100000 women in the period 2006-2016. The occurrence also happens in death rate due to ovary cancer from 5,3 to 4,6 per 100000 women. In contrast, death rate of cervical cancer increases almost twice from 4,9 to 8,5 per 100000 women.

The percentage number of death caused by cervical cancer reaches its peak in the age group 30-34 years old. Death caused by breast cancer is most common in the age group 35-35 and 45-49. 13,3% of death caused by ovary cancer in age 25-29 and 18,8% in age 40-44 years old (Fig. 1).

Compared to percentage number of death in 2006, breast and ovary cancer mortality percentage decreases from 12,5% to 8,3% and 4,3% to 4,1% in 2016. In contrast, number of death of cervical cancer increases from 7,9% in 2006 to 12,3% in 2016. The trends are also the same with their YLL in those periods (Table).

AYLL of breast cancer is hovering in number 12,0-14,5 through 2006 until 2016. In the same periods, AYLL of cervical and ovary cancer increases from 18,2 to 20,1 life years and 16,8 to 18,6 life years (Fig. 2).

From the results, we can see that the YLL of cervical cancer has exceeded the YLL of breast cancer despite it has lower number of death. It has no different pattern in all of Russian area [4]. The analysis of YLL underlined the fact that cervical cancer is now leading to a greater number of deaths among younger generations of Russian women. Breast cancer remains as the major death leading cancer in Republic of Sakha, despite its decreasing percentage mortality numbers.

Compared to death rate of breast and ovary cancer of United of states in 2016, Republic of Sakha has lower death rate when cervical cancer is not included as leading death cancer in United States [8]. Death rate of breast cancer in Ukraine is higher than in Republic of Sakha, when the death rate of cervical cancer is the same in both places [12].

Breast, cervical, and ovary cancer were contributors to female cancer mortality in republic of sakha (Yakutia). Even though YLL and AYLL due to breast and cervical cancer decreased, those two variables still increase due to ovary cancer.

AYLL value indicates the number of average shorting life in a person with the disease. AYLL of breast and cervical cancer in Republic of Sakha is lower compared to their AYLL in Russia [4].

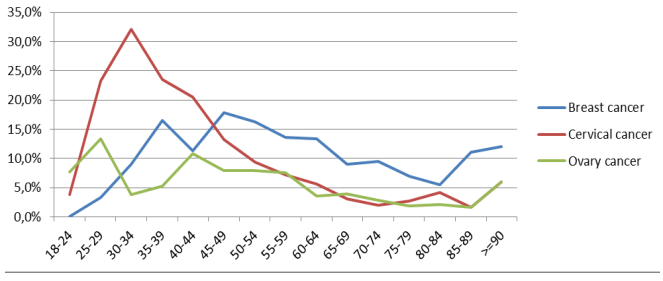

Fig. 1. The proportion of mortality from cancer of the breast, cervix and ovary from all cases of death from cancer in women in 2006-2016, in%

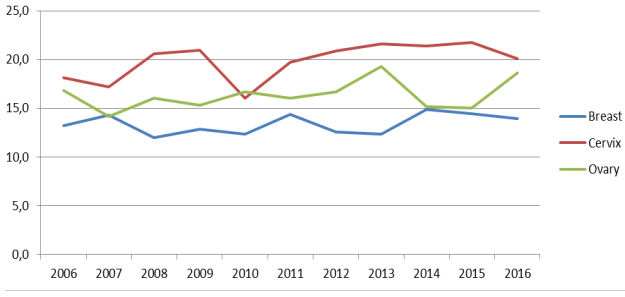

Fig. 2. Comparison of the average life years lost from cancer of the breast, cervix and ovary among oncological diseases in 2006-2016.

Some of the breast and cervical cancers factor risks are modifiable. alcohol use, excess body weight, and physical inactivity are included factor in causing breast cancer when smoking and unsafe sex contribute in occurrence of cervical cancer [9]. Healthy life-style behavior offers potential for reduction of their occurrence. In addition, primary prevention activity such as screening reduces chance of mortality case.

Conclusion. Trend of mortality, YLL, and AYLL due to breast and ovary cancer decreased in period 2006-2016 when those variables increased in cervical cancer. Based on YLL, cervical cancer is now leading to a greater number of deaths among younger generations of women in Republic of Sakha (Yakutia). Breast cancer remains as the major death leading cancer in Republic of Sakha, despite its decreasing percentage mortality numbers. Even though the number of death due to cervical cancer is much lower than breast cancer, its YLL is higher in the end of research period. Compared to death rate in Russia, USA, and Ukraine, death rate of breast cancer in republic of Sakha is lower.

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Comparative characteristics of mortality caused by specific cancer (breast cancer, cervical cancer and ovarian cancer), with YLL (YLL of each cancer / total YLL from death of all types of cancer)

Years	Death			YLL, %		
	Breast cancer	Cervical cancer	Ovary cancer	Breast cancer	Cervical cancer	Ovary cancer
2006	12.5	4.3	4.7	16.5	7.9	7.9
2007	11.1	5.5	4.5	16.6	10.0	6.6
2008	11.1	7.2	5.5	13.1	14.7	8.7
2009	12.0	5.6	4.5	15.1	11.4	6.8
2010	7.3	4.6	4.6	8.8	7.2	7.5
2011	12.0	5.8	4.3	14.4	9.6	5.7
2012	13.2	6.3	4.5	14.9	11.7	6.6
2013	10.9	8.3	3.6	12.0	16.1	6.3
2014	11.5	7.1	5.5	13.8	12.1	6.7
2015	12.1	7.7	5.0	14.1	13.5	6.1
2016	8.3	7.6	4.1	9.3	12.3	6.2

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MAIN TRENDS IN THE INCIDENCE OF TUBERCULOSIS IN THE SAKHA REPUBLIC (YAKUTIA) OVER THE PERIOD FROM 2013 TO 2018

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The main trends in the tuberculosis (TB) incidence in the Sakha Republic (Yakutia), over the period from 2013 to 2018 were revealed.

The following rates were analyzed (based on reports from facilities subordinate to Ministry of Health of the Sakha Republic (Yakutia), and reports from all agencies irrespective of subordination): TB incidence rates among general population; TB incidence among adults; TB incidence among children and adolescents; TB incidence among urban and rural population; incidence of pulmonary TB; incidence of TB cases positive for M.tuberculosis (MTB); incidence of multidrug-resistant tuberculosis (MDR) in Sakha Republic (Yakutia) in the dynamics. Favorable epidemiologic situation for TB was observed. The obtained findings call for more improvements in conducting anti-TB activities among rural population, and comprehensive measures to decrease the incidence of MDR TB.

Keywords: tuberculosis, epidemiologic situation, incidence, incidence decrease rate.

Incidence rate of tuberculosis (TB) in general population is an important indicator used in analysis of epidemiologic situation of TB. Data on TB incidence serve an unbiased method for evaluating population health and changes in it, and also, one of measures used to assess the work of TB services and healthcare facilities [4]. In view of this, monitoring of main trends in incidence rates over time is one of priority tasks, in terms of predicting the epidemiologic situation for TB and estimating quality of anti-TB care for population.

Aim: detect main trends in the TB incidence in the Sakha Republic (Yakutia), over the period from 2013 to 2018.

Methods: Based on reports from facilities subordinate to Ministry of Health of the Sakha Republic (Yakutia), and reports from all agencies irrespective of subordination, the following rates were analyzed: TB incidence rates among general population; TB incidence among adults; TB incidence among children and adolescents; TB incidence among urban and rural population; incidence of pulmonary TB; incidence of TB cases positive for M.tuberculosis (MTB); incidence of multidrug-resistant tuberculosis (MDR) in Sakha Republic (Yakutia) over the period from 2013 to 2018.

Data were extracted from national statistical reports and registries of persons with TB, collected and maintained within the scope of TB epidemiologic surveillance system of the Phthisiatry Research-Practice Center.

Statistical data processing was performed using Excel 2010, and software packages Statistica-8 and Biostat. Time series analysis was performed, to calculate mean annual rates of increase/decrease. For trend construction, and detection of tendencies in TB incidence, we calculated 5-year rates of increase and mean increase rates, performed time series fitting using quadratic approximation function, and calculated R-squared (R2) coefficient.

Results: Incidence of TB in the Sakha Republic (Yakutia) (statistical form no. 8, including reports from all agencies irrespective of subordination) was 29% lower in 2018, compared to 2013 (54.2 per 100000 pop.). It was also 18.1% higher than the average rate in Russia (44.4), and 26.8% lower than the rate in Far-East Federal District (74.1). Over the 5-year study period, the largest decrease rate was observed in 2016 (-15.2%), the lowest – in 2015 (-1.1%); mean decrease rate was -7.1%. As is seen in Fig.1, there is a negative linear trend with R2 value of 0.94, which suggests the existence of marked stable tendency to decrease in

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