

REPUBLIC OF AZERBAIJAN

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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

**EPIDEMIOLOGICAL CHARACTERISTICS OF OVARIAN
CANCER IN THE REPUBLIC OF AZERBAIJAN**

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Field of science: Medicine

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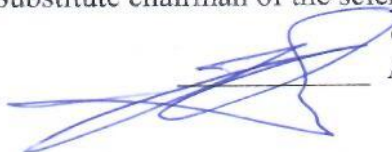
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THE RELEVANCE OF THE TOPIC

Ovarian cancer (CD) ranks second in terms of prevalence among malignant tumors of female reproductive system and the first in terms of mortality. According to GLOBOCAN database, ovarian cancer is the seventh leading cause of cancer death among women in the world.¹

Every year, 239,000 primary cases of ovarian cancer and 152,000 deaths are recorded worldwide. The highest incidence rates are recorded in developed countries of Eastern Europe, Central Europe and North America (more than 8 cases per 100,000 population). In South American countries, this indicator is 5.8 per 100,000 population, and the lowest indicators are recorded in Asian and African countries (≤ 3 per 100,000 population)^{2,3}.

Ovarian cancer takes 6-7th place after breast cancer, gastric cancer, cervical cancer, uterine cancer in the incidence of malignant tumors among women. Ovarian cancer is usually detected at a late stage and the 5-year survival rate is 29%. In only 30% of patients, ovarian cancer can be detected in the early stages, in other cases, the pathology begins to appear only in the III-IV stage. In general, the 5-year survival rate for ovarian cancer worldwide ranges from 30% to 40%, and since 1995 there has been a very slight increase in this indicator (from 2% to 4%)^{4,5}.

In 1991-2001, ovarian cancer ranked the second place after cervical cancer with 28.9% of cases in the structure of malignant tu-

¹ Ferlay J., Soerjomataram I., Ervik M., Dikshit R., Eser S., Mathers C., et al. GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC Cancer Base No. 11. Lyon, France: International Agency for Research on Cancer, 2013[2016-09-09]. <http://globocan.iarc.fr>.

² Jemal, A. Global cancer statistics. *CA Cancer / A.Jemal, F.Bray, M.Center [et al.] // J. Clin.*, - 2011. v.61, - p. 69.

³ Siegel, R. Cancer statistics, 2012 / R.Siegel, D.Naishadham, A.Jemal // *CA Cancer J. Clin.*, - 2012. №1, - p. 10-29.

⁴ Макаров, О.С. Современное состояние проблемы ранней диагностики рака яичников и пути ее решения / О.С.Макаров, С.А.Мошковский, М.А.Карпова [и др.] // *Опухоли женской репродуктивной системы*, - 2015. №1, - с. 76-82.

⁵ Батырова, Л.М. Ранняя диагностика рака яичников // *Вестник хирургии Казахстана*, - 2011. №2, - с. 46-47.

mors of female reproductive organs in the Republic of Azerbaijan. In 2001, the world standardized incidence rate was 3.8 per 100,000 female population^{6,7}.

The development of ovarian cancer is caused by several factors. It includes late birth or absence of birth, the use of oral contraceptive drugs, menopause, early menarche, prolonged treatment due to infertility, gynecological diseases, etc.. 10% of all patients have a hereditary predisposition. Thus, the presence of this disease in close relatives in the family anamnesis increases the risk of developing ovarian cancer by 3-7 times, and the presence of rare mutations in BRCA1 and BRCA2 genes significantly increases the risk of developing ovarian cancer. Harmful habits, long-term contact with carcinogenic substances, poor nutrition and unsatisfactory environmental conditions also lead to the development of cancer^{8,9,10}.

There is currently a need to develop a reliable and cost-effective alternative screening program that can be applied for timely detection, early and differential diagnosis of ovarian cancer. The development of new methods for assessing the biological characteristics of the tumor, the study of risk factors that determine recurrence and metastases, and timely measures are especially important. Considering disease lethality, it is of great importance to investigate reliable prognostic criteria that determine treatment tactics. All of these factors confirm the relevance of the study.

The purpose of the research

To study the prevalence of ovarian cancer, the identification of

⁶ Əliyev, C.Ə. Bəd xassəli şişlərin şüa müalicəsi: nəzəri əsasları, tətbiqi, nəticələri. / C.Ə.Əliyev, İ.H. İsayev - Bakı, - 2012. - 890 s.

⁷ Əmiraslanov, Ə.T. Onkologiya. / Ə.T.Əmiraslanov, A.Y.Qazıyev - Bakı: Təhsil, - 2010. – 912 s.

⁸ Ziogas A, Gildea M, Cohen P, Bringman D, Taylor TH, Seminara D, et al. Cancer risk estimates for family members of a population-based family registry for breast and ovarian cancer. *Cancer Epidemiol Biomarkers Prev.* 2000;9:103–11.

⁹ Malander S, Ridderheim M, Masbäck A, Loman N, Kristoffersson U, Olsson H, et al. One in 10 ovarian cancer patients carry germ line BRCA1 or BRCA2 mutations: results of a prospective study in Southern Sweden. *Eur J Cancer.* 2004; 40:422–8

¹⁰ Orr, B. Diagnosis and Treatment of Ovarian Cancer / B.Orr, R.Edwards // *Hematol. Oncol. Clin. North Am.*, - 2018. №6, - p. 943-964 (doi: 10.1016/ j.hoc.2018.07.010).

risk factors for the development of the disease in the administrative-territorial districts of the Republic of Azerbaijan.

Research objectives:

1. To study ovarian cancer morbidity and mortality rates in Baku.
2. To determinate the epidemiological characteristics of ovarian cancer in different regions of the Republic.
3. To identify risk factors for ovarian cancer.
4. To develop practical recommendations on primary prevention of ovarian cancer for early diagnosis in the Republic.

Research methods

The study analyzed the incidence and mortality rates from ovarian cancer in various administrative-territorial regions of Azerbaijan for 2015-2019. Extensive and intensive indicators, standardized indicators of ovarian cancer as well as incidence, prevalence and aggressiveness indicators, 5-year survival rate were calculated. Calculation of statistical indicators was carried out according to the method of determining epidemiological parameters based on WHO recommendations and the rules for conducting medical statistics.

Main provisions of the dissertation

1. Epidemiological characteristics of the disease in the regions of Respulika should be taken as a basis for the primary prevention of ovarian cancer.
2. Clinical and histological aspects of ovarian cancer should be taken into account in the regions with a high incidence rate.
3. In the organization of preventive measures against ovarian cancer, a special oncological prevention approach is required by doctors as primary care for women over 50 years of age.

Scientific novelty of study

The study is aimed at improving the quality of medical care for patients with ovarian cancer, that is one of the actual problems of clinical oncology. Research findings determined morbidity and mortality rates of ovarian cancer in administrative districts of the Republic of Azerbaijan. At the same time, economic regions with high and low ovarian cancer morbidity and mortality rates were ascertained.

The theoretical and practical significance of the study

The research findings will be the basis for developing the necessary measures for the initial diagnosis and prevention of this pathology in regions with a high incidence rate of ovarian cancer. It will make possible to detect the disease in time for effective treatment.

Approbation of the dissertation:

The materials of the dissertation were presented at the scientific-practical conference of young scientists and specialists of the National Oncology Center dedicated to the National Revival Day (Baku, 2017), Materials of the scientific-practical conference dedicated to the birthday of national leader H.A.Aliyev (Baku, 2018 and 2019), at scientific-practical conferences at the X and XI congresses of oncologists and radiologists of the CIS countries (2018 and 2020), II International Congress of Karabakh-Applied Sciences (2021).

The results of the dissertation were reported and discussed at the interdepartmental meeting of National Center of Oncology of the Ministry of Health of the Republic of Azerbaijan (20 July 2022, protocol N5), at the scientific seminar of the FD 1.02 Dissertation Council operating under NCO of the Ministry of Health of the Republic of Azerbaijan (19 September 2022, protocol N6).

The main theoretical and practical provisions of the dissertation are mentioned in 14 published scientific works. Scientific works on the topic of the study were published both in Azerbaijan (5 articles, 4 theses), and in foreign journals (2 article, 3 theses).

Application of the study

The results of the research are used in the lectures and practical work at the Oncology Department of Azerbaijan State Advanced Training Institute for Doctors named after A.Aliyev. Practical recommendations are used in the experimental work of the Oncogynecology Department of the National Center of Oncology of the Ministry of Health of the Republic of Azerbaijan.

The organization in which the dissertation is carried out

The dissertation work was carried out at National Center of Oncology of the Ministry of Health of the Republic of Azerbaijan

The volume and structure of the dissertation

The dissertation is presented on 129 pages of typewritten text

(258.931 characters) consisting of an introduction (9.571 characters), literature review (51.265 characters), "Materials and methods" chapter (14.548 characters), 3 chapters of personal research (97.476 characters), results (37.605 characters), conclusions and practical recommendations (2.201 characters) and references (39.943 characters). The list of references includes 203 sources. The dissertation contains 25 tables and 19 figures.

MATERIALS AND METHODS

In the study, the morbidity and mortality rates of ovarian cancer were analyzed in the administrative-territorial regions of the Republic of Azerbaijan during 2015-2019. Epidemiology of ovarian cancer was estimated according to the following indicators based on the calculations made on the basis of report forms No. 7 of the "Report on Malignant Tumors" approved by the State Statistics Committee of the Republic of Azerbaijan.

- intensity indicator (per 100,000 population);
- extensiveness coefficient (%);
- standardized indicator (per 100,000 population);
- total mortality rate (per 1000 population);
- lethality coefficient (in %);
- attack rate (per 100,000 population);
- aggressiveness rate;
- 5-year survival (%).

The above indicators are calculated according to the methodology proposed by the World Health Organization.

The age-standardized indicator of ovarian cancer incidence was determined by the direct standardization method and consisted of three stages:

1. Calculation of the intensity indicator per 100,000 population
2. Calculation of average standards
3. Calculation of standardized indicators

In order to achieve the goal, the Republic territory is divided into 11 economic-territorial regions, based on the recommendations of the National Academy of Sciences and the State Statistics Committee. Information about the number of population in the Republic was taken

from the Informatics and Statistics Department of the Ministry of Health of the Republic of Azerbaijan.

Materials for the study of incidence of primary ovarian cancer were medical histories taken from the National Center of Oncology. The morbidity analysis was carried out using the medical histories (registration form No. 281) of 182 patients with primary ovarian cancer. Patients' age and marital status were determined using a special questionnaire.

Correlation analysis of the indicators of the health status of ovarian cancer patients was performed using the EXCEL for Windows xp application program on a personal computer.

RESEARCH RESULTS AND DISCUSSION

It was determined that ovarian cancer (OC) is the fourth most common malignancy in women in the Republic of Azerbaijan after breast cancer (BC), cervical cancer (CC) and gastric cancer (GC). Extensiveness and intensity indicators for ovarian cancer were 5.3% and 7.1 ⁰/₀₀₀₀, respectively, and ranked 4th after the pathologies listed above, and second in malignant tumors of the female reproductive system.

Table 1 shows the stage distribution of patients diagnosed for the first time during the study. As shown in the Table 1, the average number of patients admitted in I-II stage of the disease is 45.5%, and the number of patients with III-IV stage is 54.5%.

Table 1
Stage division of primary ovarian cancer patients in the Republic of Azerbaijan in 2015-2019

Years	Stages (%)		
	I - II	III	IV
2015	52,1%	32,9%	15,0%
2016	43,8%	35,9%	20,3%
2017	47,1%	28,9%	24,0%
2018	44,6%	32,7%	22,7%
2019	39,8%	38,9%	21,3%
Σ	45,5%	33,9%	20,6%

The analysis of the dynamics of the primary and all patients with ovarian cancer in the Republic of Azerbaijan in 2015-2019 showed that the morbidity rate remained stable. The extensiveness index varied from 5.3% to 5.9% for primary patients and from 5.4 to 5.6% for all patients. A relatively high level of the extensiveness index of primary patients was observed in 2016 and 2018 and was 5.9%.

As a result of the analysis of the extensiveness and intensity indicators of all ovarian cancer patients in separate regions, the relatively high level of these indicators was observed in the Ganja-Kazakh economic region (respectively, 7.7% and 9.5 ‰). The indicators for this region were 1.4 times higher than the republic-wide indicators. The extensiveness in Absheron, Sheki-Zagatala, Guba economic regions were also higher than the republic-wide indicator and were 6.4%, 6.2% and 5.7%, respectively.

As a result of the analysis of the intensity, this indicator in the economic regions of Absheron (9.5 ‰), Ganja-Gazakh (9.5 ‰), Guba-Khachmaz (7.1 ‰), Nakhchivan (7.0 ‰) was higher the republic-wide indicator. Relatively low extensiveness and intensity indicators were recorded in Lankaran economic region (respectively, 3.6% and 2.8 ‰). In addition, Mountainous-Shirvan (4,5%) and Central Aran (4,5%) had low extensiveness indicator. The intensity indicator for Central Aran economic region was 4.3 ‰ which was lower than the republic-wide indicator (Figure 1).

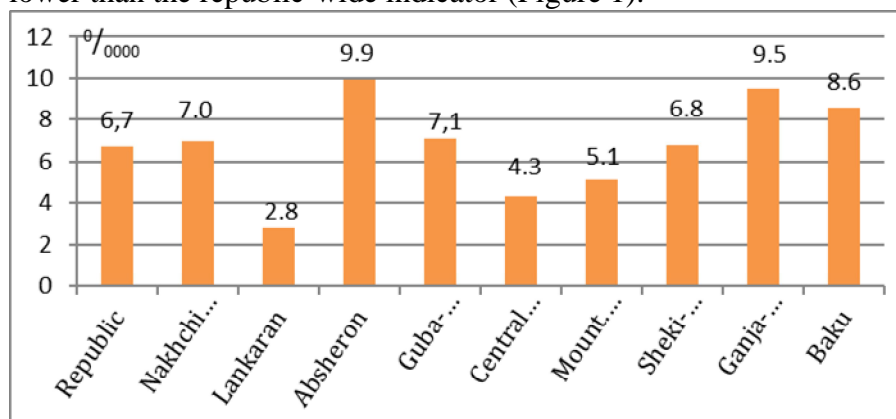


Figure 1. Intensity indicator of ovarian cancer in economic regions of the Republic of Azerbaijan (per 100,000 people)

As a result of the analysis of attack rate for ovarian cancer patients in 2015-2019, a stable increase of this indicator was determined. In other words, while the attack rate was 29.6⁰/₀₀₀₀ in 2015, this rate was 36.1⁰/₀₀₀₀ in 2019. So, the indicator increased by 1.2 times during the research period.

As a result of calculating the attack rates in the regions of the Republic, it was determined that the highest attack rate is in Absheron economic region (43.7⁰/₀₀₀₀), and the lowest is in Nakhchivan region (10.90/0000). The attack rate for the republic was 36.1⁰/₀₀₀₀, and as a result, the indicator of Absheron region was 1.2 times higher, and the indicator of Nakhchivan region was 3.3 times lower than the republican indicator. The attack rates for the other regions were as follows: Ganja-Gazakh - 40.8⁰/₀₀₀₀, Guba-Khachmaz - 32.9⁰/₀₀₀₀, Sheki-Zagatala - 30.3⁰/₀₀₀₀, Mountainous Shirvan - 29.0⁰/₀₀₀₀, Aran - 23.2⁰/₀₀₀₀, Lankaran - 17.4⁰/₀₀₀₀.

A number of errors may be encountered during the analysis of the mortality rates of malignant tumors. The death rate in terms of an epidemiological perspective is considered a valuable source of information about trends in the health status of the population. The lethality index is considered as a measure of the severity of the disease.

The statistical analysis in regions of the Republic of Azerbaijan showed that the highest mortality rate was recorded in Sheki-Zagatala and Absheron economic regions (0.07⁰/₀₀ and 0.06⁰/₀₀, respectively), and the lowest in Guba-Khachmaz and Aran economic regions (both 0.02⁰/₀₀, respectively). This indicator was 0.04⁰/₀₀ in Nakhchivan economic region, 0.03⁰/₀₀ in Lankaran and 0.03⁰/₀₀ in Mountainous Shirvan economic region. The total mortality rate in the republic was 0,04⁰/₀₀.

The study found that the variation range of the lethality index is quite high. In thus, the analysis of the dynamics of lethality rate of the ovarian cancer in 2015-2019 showed that it remained stable during these years and varied in the range of 23.4%-30.4%. The highest lethality rate was recorded in the Lankaran economic region (75.0%), which is 3.1 times higher than the republic level. The lowest level of this indicator was observed in the Absheron district (14.2%) (1.7 times less than the republican indicator). In other economic regions,

this indicator is shown on the graph. This indicator for the republic is 24.0% (Figure 2).

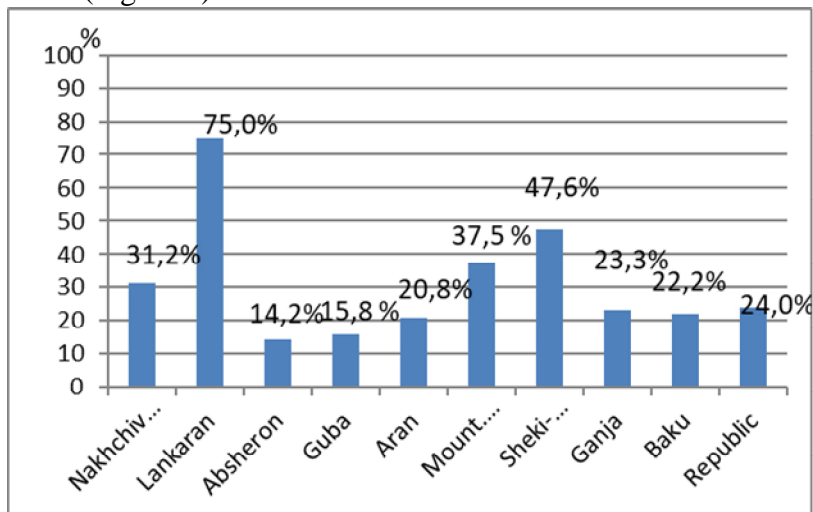


Figure 2. Lethality rates of ovarian cancer patients in the republic (%)

During these years, there was a decrease in the dynamics of 5-year survival in ovarian cancer in the Republic. So, 5-year survival rate in 2015 was 35.1%, and in 2019 – 32.2%. The analysis of the 5-year survival rate by regions revealed that the highest rate was in Ganja-Gazakh and Guba-Khachmaz economic regions (47.5% and 44.3%), and the lowest rate was in Mountainous-Shirvan economic region with 17.8%.

Aggressiveness indicator, which determines the activity of conducting screening programs, were calculated. The statistical analysis revealed a fairly high level of this indicator in the Lankaran and Sheki-Zagatala economic districts. (1.1 and 1.0, respectively). The lowest level of aggressiveness index was recorded in Guba-Khachmaz economic region with 0.3 (Table 2).

The standardization is an important method for comparing 2 or more populations that differ in a number of key parameters. This method eliminates the influence of different age distribution on the comparable indicators of the disease. The direct standardization method was used for calculating the standardized index of ovarian

cancer incidence in the republic. So, the composition of the studied contingent was known and their number was large enough to get appropriate results.

Table 2

Aggressiveness index of ovarian cancer in regions of the Republic of Azerbaijan

Region	Aggressiveness index
Absheron	0,6
Lankaran	1,1
Mountainous Shirvan	0,6
Aran	0,5
Ganja-Gazakh	0,5
Shaki-Zagatala	1,0
Guba-Khachmaz	0,3
Nakhchivan	0,6
Republic	0,6

It must also be important to note that ovarian cancer was recorded in rare cases in women under the age of 18 throughout the follow-up period.

Table 3

The age-standardized rates for ovarian cancer incidence in Azerbaijan in 2019 (per 100000 population)

Age	Intensity (°/0000)	Average standard	Standardized indicator (°/0000)
0-17	0,2	24225,1	0,05
18-29	0,7	19668,0	0,1
30-39	2,9	15478,5	0,5
40-49	8,1	12769,1	1,1
50-59	19,7	1488,96	2,7
60-69	20,7	8441,4	1,7
70 <	13,9	4528,3	0,7
Σ	6,7	100.000	6,8

The peak incidence of ovarian cancer in Azerbaijan occurs in the age group of 50-59 and standardized indicator was $2.7^{0}/_{0000}$, respectively. In the age group of 60-69 years, this figure has relatively decreased. The general standardized indicator for the Republic was $6.8^{0}/_{0000}$.

The epidemiological characteristics of ovarian cancer were also studied in the administrative-territorial districts included in the economic regions of the republic.

Baku economic region includes 12 administrative districts (Binagadi, Garadag, Khazar, Sabail, Sabunchu, Surakhani, Narimanov, Nasimi, Nizami, Pirallahi, Khatai, Yasamal). In the this region, ovarian cancer accounts for 5.1% of the incidence structure of malignant tumors among the female population, and a significant difference in this indicator was recorded in different districts of the city. Thus, the highest extensiveness index was recorded in the Narimanov district and was 8.6% which was 1.6 times more than the regional figure. The lowest indicator was registered in Pirallahi district (0.8% respectively) and was 6.3 times less than the regional indicator.

The intensity indicator in Sabail ($17.0^{0}/_{0000}$), Narimanov ($12.2^{0}/_{0000}$), Khatai ($11.1^{0}/_{0000}$), Sabunchu ($9.8^{0}/_{0000}$) districts of the region was higher than the indicator ($8.6^{0}/_{0000}$). The study showed that the highest attack rate was in Sabail ($71.8^{0}/_{0000}$) and the lowest in Pirallahi district ($5.2^{0}/_{0000}$). In general, the attack rate of ovarian cancer in the region was $50.8^{0}/_{0000}$.

Calculation of total mortality rate showed that the lowest rate was in Sabunchu district ($0.02^{0}/_{00}$), while the highest rates were in Sabail and Garadag districts ($0.2^{0}/_{00}$ and $0.1^{0}/_{00}$, respectively), which it was 4-5 times higher than the city indicator ($0.06^{0}/_{00}$).

The lethality index in different districts of Baku was quite high. Thus, this indicator was 71.4% in Nasimi district, and 6.2% in Khatai district. At that time, the total city indicator was 22.2%. Also, high indicators were recorded in Pirallahi, Khazar, Surakhani, Nizami, Sabunchu regions (55.5%, 42.8%, 40.0%, 33.3% and 32.2%, respectively). The analysis of materials on the 5-year survival of patients in the city revealed a low level of this indicator (42.4% for the city as a whole).

The "peak" incidence of ovarian cancer in Baku falls on the age groups of 50-59 and 60-69, which the age-standardized incidence rate was $3.4^{0}/_{0000}$ and $2.5^{0}/_{0000}$, respectively. From the 70 and under age group, there was a decline in the standardized incidence rate. Regardless of age, the standardized index was $8.8^{0}/_{0000}$.

Ganja-Kazakh economic region includes 2 cities (Ganja and Naftalan) and 9 administrative-districts. In 2015-2019, ovarian cancer ranked 3rd-5th in the structure of malignant tumors among women in the region. The extensiveness indicator for the region is 7.7%, which the higher indicator is 10.5%-0.9% in Samukh district (1.4 times more than the regional indicator), and the lower indicator is in Naftalan - 0.9% (8.5 times less than the regional indicator) was noted.

During the calculation of disease intensity and attack rates, a big difference between the regions was determined. Thus, while the intensity indicator of Samukh district is $20.6^{0}/_{0000}$, this indicator is $5.8^{0}/_{0000}$ in Goranboy district. Calculation of the attack rate determined that the highest indicator was observed in Ganja ($86.0^{0}/_{0000}$, respectively) and this figure was 2.1 times higher than the overall region indicator ($40.8^{0}/_{0000}$).

The analysis of mortality rates showed that the highest total mortality rate was in Shamkir district (respectively, $0.07^{0}/_{00}$), and the lowest rate was in Agstafa district (respectively, $0.02^{0}/_{00}$). The overall mortality rate for the region was 0.05, respectively. The lethality rate for the region was 23.3%. The highest level of the lethality was recorded in Goygol and Shamkir regions and was 75.5% and 53.8%, respectively.

In the analysis of the in the Ganja-Gazakh region, the lowest rate was found in Shamkir and Tovuz (5.9% and 6.9%, respectively), and the highest rate was in Goygol and Ganja (69.2% and 64, respectively). The overall regional 5-year survival rate was 47.5%. The analysis of standardized indicators of morbidity in different districts of the region showed that this nosological form is not found in women under 30 years of age. The highest rate was recorded in the 50-59 age group. The standardized indicator of ovarian cancer for the general region, regardless of age, was $9.5^{0}/_{0000}$.

The Guba-Khachmaz economic region located in the north of the republic includes five administrative districts: Shabran, Guba, Khachmaz, Gusar, Siyazan. The conducted analysis determined that the highest extensive indicator was in Khachmaz district (6.9%), and the highest intensity indicator was in Gusar and Guba districts ($10.4^0/0000$ and $8.4^0/0000$, respectively). Extensive and intensity indicators for the whole region were 5.7% and $7.1^0/0000$, respectively. The highest attack rate was in Gusar district ($49.9^0/0000$), and the lowest level was registered in Siyazan district ($9.6^0/0000$). The general regional indicator was $32.9^0/0000$.

The statistical analysis showed that the highest 5-year survival rate in the Guba-Khachmaz region was recorded in the Guba region - 51.3%. The indicators of other administrative regions were as follows: Gusar - 50.0%, Siyazan - 50.0%, Khachmaz - 35.3%, Shabran - 12.5%. The indicator for the overall region was 44.3%.

The calculation of the total mortality rate in the region determined that the highest level was recorded in Khachmaz district ($0.03^0/0000$), and the lowest level was recorded in Gusar and Guba districts ($0.02^0/0000$). The overall mortality rate for the region was $0.02^0/0000$. The highest lethality level was recorded in Gusar district, and the lowest in Guba district, and the lethality indicators of these districts were 20.0% and 14.3%, respectively. This indicator was 15.8% for the entire region.

The calculation of standardized indicators showed that cases of ovarian cancer were not registered among women under 30 years of age in the studied region. The highest incidence was observed in the 50-59 age group, where the standardized indicator was $1.9^0/0000$. Starting from the 60-69 age group, a decrease was observed, and the lowest level was noted in the age group of 70 years and above, that standardized indicator was $0.7^0/0000$.

Aran economic region is one of the largest regions of the republic and includes 16 administrative districts and 2 cities. Ovarian cancer ranks 4th-5th among women in this region in terms of morbidity. During the research years, the overall regional extensiveness indicator was 4.5%. It should be noted that a significant difference in the indicators of extensiveness in administrative-districts was recorded.

For example, this indicator was 1.8% in Barda district, while it was 10.0% in Neftchala district (the difference was more than 5 times). During the calculation of disease intensity indicators, the highest level was recorded in Saatli district (respectively $9.6^{0/0000}$), and the lowest in Imishli district (respectively, $1.6^{0/0000}$). The general regional indicator was $4.3^{0/0000}$ (Figure 3).

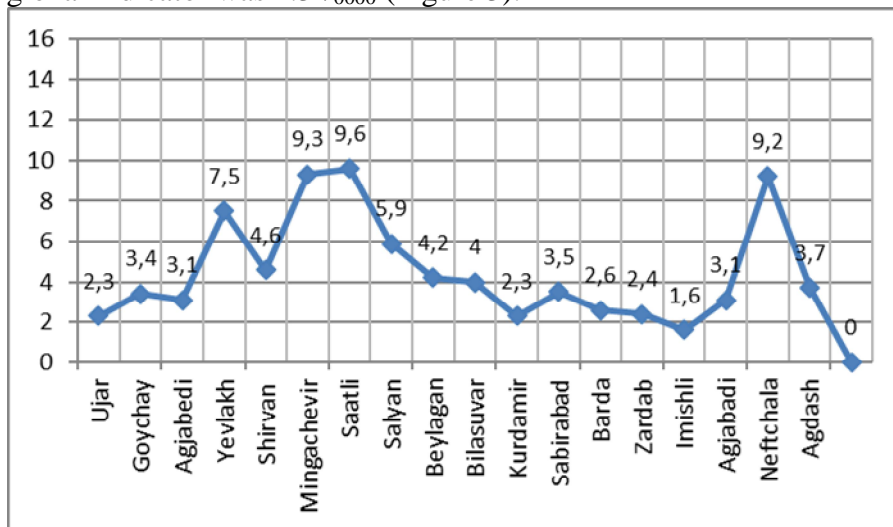


Figure 3. Intensity indicators of ovarian cancer incidence in different districts of the Aran economic region (per 100,000 people)

A significant difference in attack rates of districts of region was recorded. For example, if the attack rate in Ujar district was $2.3^{0/0000}$, it was $125.9^{0/0000}$ in Beylagan district (the difference was more than 50). At the same time, the indicators of 7 administrative districts (Shirvan, Yevlakh, Imishli, Mingachevir, Beylagan, Zardab) were higher than the overall regional indicator ($23.2^{0/0000}$).

In only 4 administrative districts of the region, the 5-year survival rates were more than 50%: Imishli - 85.9%, Ujar - 75.0%, Hajigabul - 75.0%, Saatli - 70.0%. The lowest 5-year survival rate was recorded in Bilasuvar district and was 7.5%, respectively.

It was determined that there was no case with this nosology among women in 0-17, 18-29 ages group. Starting from the 30-39

age group, an increase in the incidence rate was recorded, and the peak of the incidence was in the 50-59 age group and was $1.8^{0}/_{0000}$. In older age groups, a sharp decrease was noted with a decrease in the incidence rate of up to $0.4^{0}/_{0000}$. The standardized indicator of ovarian cancer incidence for the region, regardless of age, was $4.3^{0}/_{0000}$.

The statistical analysis showed that the aggressiveness coefficient in ovarian cancer patients was quite high in most administrative districts of the Aran economic region, and it was 2.0 in Goychay, 1.1 in Agdash, and 1.1 in Hajigabal.

Sheki-Zagatala economic region is located in the north-west of the republic and includes Balakan, Gakh, Gabala, Oguz, Sheki, Zagatala regions. Among the contingent of patients with malignant tumors in the studied economic region, ovarian cancer was 6.2% of women (general regional indicator).

Extensiveness rates were different in districts of region. So, if this indicator was 11.4% in Balakan district, it was 4.4% in Gabala district. The extensiveness indicator of Sheki was 5.1%, Zagatala - 5.8%, Gakh - 6.1%, and Oguz - 10.3%. The overall region indicator was 6.2%. The same situation was observed during the calculation of intensity and attack rate. A high level of morbidity with ovarian cancer was recorded in Oguz, and the intensity indicator in this region was $13.9^{0}/_{0000}$.

The lowest intensity level was recorded in Sheki ($5.4^{0}/_{0000}$, respectively), which was 2 times more than the general regional indicator ($6.8^{0}/_{0000}$). During the calculation of the attack rate, a significant difference between the indicators of the regions was recorded. Thus, the highest attack rate was observed in Sheki district ($40.1^{0}/_{0000}$), and the lowest in Zagatala district ($18.7^{0}/_{0000}$) (2 times more). This figure for the whole region was $30.3^{0}/_{0000}$.

The analysis of death indicators showed that the highest level of the lethality was registered in Sheki (75.5%), Gakh (75.5%) administrative districts, and the lowest level was 33% in Gabala. The analysis of the total mortality showed that this indicator was $0.2^{0}/_{00}$ in Gakh, while it was $0.03^{0}/_{00}$ in Zagatala (10 times less). The indicators of other regions were as follows: Oguz - $0.09^{0}/_{00}$, Sheki - $0.09^{0}/_{00}$, Balakan - $0.08^{0}/_{00}$, Gabala - $0.04^{0}/_{00}$. The indicator for the entire

region was 0.07⁰/₀₀.

The results of research determined the level of 5-year survival in the studied region, and this indicator for the region was 24.7%. Thus, the highest indicator was 50.0% in Zagatala, and the lowest in Gakh district - 10.5%. When calculating the standardized index of ovarian cancer incidence, no cases of morbidity were recorded in age groups up to 40. The highest morbidity rate was observed in the 60-69 age group (3.2⁰/₀₀₀₀). The overall regional indicator was 5.9⁰/₀₀₀₀.

The Absheron economic region is not very large in area, includes one city (Sumgait) and two administrative regions (Absheron and Khizi). In the Absheron region, OC ranks 5-6 in the structure of morbidity with malignant tumors among women, and the extensiveness indicator for the entire region was 6.14%. The extensiveness indicator in Absheron region was 2.3%, and was 7.3% in Sumgait.

The calculation of intensity and attack indicators showed a relatively high level in Sumgait (12,2⁰/₀₀₀₀ and 56,4⁰/₀₀₀₀, respectively).

The fatality index for the entire region was 14.2%, and the highest level of this indicator was recorded in Absheron (75.5%), and the lowest was recorded in Sumgait (19.0 %). The analysis of materials on the 5-year survival of patients with OC in subjects of the region determined its low level, and this indicator was 29.0%. This indicator was 23.1% in Absheron district, and 30.9% in Sumgait city.

The calculation of the standardized index of ovarian cancer morbidity in the Absheron economic region determined that this nosological form was registered in all age groups, except for the 0-17, 18-29 age groups. The highest level of morbidity was determined in the 60-69 age group (5.3⁰/₀₀₀₀), and the overall indicator for the region was 9.4⁰/₀₀₀₀.

In the Nakhchivan economic region, the intensity indicator characterizing the incidence of ovarian cancer among every 100,000 women is 7.0⁰/₀₀₀₀, the extensiveness indicator, which shows the incidence of ovarian cancer in % among all malignant tumors detected for the first time, is 5.6%, and the attack rate, which shows the incidence among all registered women diagnosed with ovarian cancer, was 10.9⁰/₀₀₀₀.

Analyzing the statistical material on the status of the disease, it

is known that this nosological form is more common in the 18-29 and 50-59 age groups (respectively, $2.3^{0}/_{0000}$ and $2.6^{0}/_{0000}$). The lethality ratio, which shows the percentage of deaths among women with ovarian cancer, was 31.2%, and the overall mortality ratio, which shows the number of deaths per 1000 people in a certain period of time, was $0.04^{0}/_{00}$ in the average total population. The 5-year survival rate for the entire region was 28.0%

The Lankaran economic region includes 6 administrative districts: Astara, Lankaran, Lerik, Yardimli, Masalli, Jalilabad. Ovarian cancer ranks 4-5 in the structure of the incidence of malignant tumors among women in the Lankaran economic region. The extensiveness indicators of different administrative-districts of the region were in the range of 1.2-10.7%, and the overall regional indicator was 3.6%. Morbidity indicators were relatively stable and intensity indicator was $2.8^{0}/_{0000}$, and attack rate was $17.4^{0}/_{0000}$.

Research showed that mortality rate ($0.06^{0}/_{00}$) and lethality rate (50.0%) were relatively high in Lankaran. The overall mortality rate and lethality rate for the entire region were $0.03^{0}/_{00}$ and 75.0%, respectively. The 5-year survival rate was relatively low and was 24.0% for the entire region.

In the studied region, the "peak" of the incidence of ovarian cancer was observed in the 40-49 age group, where the age-standardized indicator was $1.1^{0}/_{0000}$, respectively. In the age group of 60-69 years, this indicator decreased to a relatively low level. The general age-standardized indicator for the region was $2.8^{0}/_{0000}$, respectively.

The Mountainous Shirvan economic region has a relatively small area and includes 4 districts - Ismayilli, Gobustan, Agsu and Shamakhi districts. Research showed that the incidence rate of ovarian cancer in the Mountainous-Shirvan economic region is not relatively high. The extensiveness indicator of the this nosological form in the region was 4.5%, and the intensity and attack indicators were $5.1^{0}/_{0000}$ and $29.0^{0}/_{0000}$, respectively. Against the background of a relatively high lethality index (37.5%), the overall mortality rate was low and, accordingly, was $0.03^{0}/_{00}$. The 5-year survival rate was 17.8%, and the aggressiveness index was 0.6. There were no cases of ovarian cancer in the 40-year-old age group. The highest incidence

occurred in the 50-59 age group and was $3.2^0/0000$.

During the study, the medical histories of 182 patients who were examined and treated with ovarian cancer pathology in the National Center of Oncology of the Ministry of Health of the Republic of Azerbaijan during 2014-2019 were analyzed. The analysis was carried out according to the following indicators: the age of the patients and the sexual life of women, blood group, determination of onomarkers in the blood, clinical characteristics of the blood. The results of the analysis of the medical histories of 182 patients receiving inpatient treatment showed that ovarian cancer occurs mostly in the 50-59 (42.7%) and 60-69 (25.3%) age groups. At this time, the least number of patients was registered in the age groups of 0-17 years and 18-30 years, which was 1.8%. Analysis of hemogram results of ovarian cancer patients revealed abnormal changes in most of them. Ovarian cancer cases were more common in the 50-59 (63.2%) and 60-69 (72.4%) age groups due to the presence of abortions in the anamnesis. Ovarian cancer was detected in 13.3% of cases in the first year of menopause, and in 9.2% of cases 10 years after menopause. An increase in CA-125 oncomarker indicators in the blood of patients was recorded in 79-87.5% of cases. At the same time, regardless of age group, II(A) blood group prevailed in patients (38.3%). Well differentiated epithelial serous carcinoma was more common, and this was recorded in 68.5% of cases.

According to the results of the research, in the Republic of Azerbaijan in 2015-2019, the highest ovarian cancer morbidity rate were recorded in the Ganja-Kazakh economic region, and the lowest in the Lankaran economic region. In most economic regions of the republic, the incidence of ovarian cancer is mostly recorded in the 50-59 age group. Detection of the disease in 54.5% of cases at the III-IV stage shows the importance of early diagnosis in improving the quality of life of patients with ovarian cancer. Gynecologists, oncologists and healthcare organizers of general treatment-prevention medical institutions take the leading place in this matter in the regions where the incidence of ovarian cancer is high. Based on the analysis of clinical data of patients with ovarian cancer, a number of indicators have been identified, which will help to strengthen the oncological competence of practicing public

health physicians in regions with high morbidity.

CONCLUSIONS

1. The highest indicator of extensiveness and intensity of ovarian cancer in the Republic of Azerbaijan was recorded in the Ganja-Kazakh economic region, and these indicators were 7.7% and $9.5^0/0000$, respectively. However, the lowest indicators of extensiveness and intensity were recorded in Lankaran economic region and were 3.6% and $2.8^0/0000$, respectively. These indicators of extensiveness and intensity for the Republic were 5.3 and 6.7, respectively [3,6,7,8].
2. The highest attack rate in the republic was recorded in the Absheron economic region ($43.7^0/0000$), and the lowest in the Nakhchivan region ($10.9^0/0000$). This indicator for the Republic was $36.1^0/0000$. The highest mortality rate was recorded in Sheki-Zagatala and Absheron economic regions ($0.07^0/00$ and $0.06^0/00$, respectively), and the lowest in Guba-Khachmaz and Aran economic regions (both $0.02^0/00$, respectively). The total death rate for the Republic was $0.04^0/00$. The total lethality index for the Republic was 24.0% [7, 11, 12, 13].
3. The republic 5-year survival rate study clarified the average level for all regions and determined the national rate to be 32.2% [1,7].
4. In most economic regions of the republic, the incidence of ovarian cancer was mostly recorded in the 50-59 age group, and the standardized indicator for the republic, independent of the patient's age, was 6.8 [1,7].

PRACTICAL RECOMMENDATIONS

1. Measures for the primary prevention of ovarian cancer should be of a complex nature, including medical and social aspects.
2. Determining the high level of morbidity with ovarian cancer in the Absheron and Ganja-Gazakh economic regions requires more attention and special oncological care from the doctors.
3. Due to the high level of standardized morbidity indicators of ovarian cancer in people over 50 years of age, those belonging to this age group should be given special oncological care by doctors of practical health.

List of published scientific works on the top of the dissertation

1. Алиев, Д.А. Заболеваемость злокачественными новообразованиями в Азербайджанской Республике в 2016 году / Д.А. Алиев, Ф.А.Марданлы, Ибишова, Л.М. [и др.] // *Azərbaycan Onkologiya jurnalı*, -2017. №2, -s. 66-69;
2. İbişova, L.M. Yumurtalıq şişlərində ilkin və son kliniki diaqnozların müqaisəli təhlili // *Milli Dirçəliş gününə həsr olunmuş Milli Onkologiya Mərkəzinin gənc alim və mütəxəssislərin elmi-praktiki konfransının tezisləri*, -Bakı, -2017, -s. 16;
3. Ибишова, Л.М. Заболеваемость и смертность от рака яичников в Гянджа-Газахском экономическом регионе // *Azərbaycan Onkologiya Jurnalı*, -2018. №2, -s. 81-83
4. Гусейнова, Р.А., Ибишова, Л.М. Злокачественные новообразования яичников в Горно-Ширванском экономическом регионе Азербайджана // *Ümummilli lider Н.Ə.Əliyevin ad gününə həsr olunmuş elmi-praktiki konfransın materialları*, -Bakı, -2018. -s.35;
5. Марданлы, Ф.А., Ибишова, Л.М., Алиева, Ф.К. Эпидемиологические аспекты заболеваемости рака яичников в г. Баку // *Материалы X съезда онкологов и радиологов стран СНГ и Евразии*, -Сочи, -2018, -с. 300
6. Ибишова, Л.М. Эпидемиологические аспекты заболевания раком яичников в Ленкоранском экономическом регионе Азербайджана // *Ümummilli lider Н.Ə.Əliyevin ad gününə həsr olunmuş elmi-praktiki konfransın materialları*, -Bakı, -2019, -с.37;
7. Ибишова, Л.М. Заболеваемость и смертность от злокачественных новообразований яичников в Азербайджане за период 2013-2017 гг. // *Медицинские новости*, -2019. №4, -с. 78-80;
8. Ибишова, Л.М. Эпидемиологические аспекты заболевания раком яичников в Южном регионе Азербайджанской Республики // *Хирургия, Минск*, -2019. -с. 38-39.
9. Ибишова, Л.М. Эпидемиологические аспекты заболевания раком яичников в Губа-Хачмазском экономическом регионе Азербайджана // *Тезисы XI Съезда онкологов и радиологов стран СНГ и Евразии*, -Казань, - 2020. - с. 34.

10. İbişova, L.M. Quba-Xaçmaz iqtisadi regionunda yumurtalıq xərçənginin epidemioloji xüsusiyyətləri // II Beynəlxalq Qarabağ-Tətbiqi Elmlər Konqresi, -8-10 noyabr, - 2021, -s.108;
11. İbişova, L.M. Aran iqtisadi regionunda yumurtalıq xərçənginin epidemioloji xüsusiyyətləri // Azərbaycan təbabətinin müasir nailiyyətləri, -2022. № 2, -s. 55-58;
12. İbişova, L.M. Quba-Xaçmaz iqtisadi regionunda yumurtalıq xərçənginin epidemioloji xüsusiyyətləri // Ə.Əliyev adına elmi praktik-jurnal “Tibb və Elm”, - 2022. № 1, -s.56-59;
13. İbişova, L.M. Naхçıvan iqtisadi regionunda yumurtalıq xərçənginin epidemioloji xüsusiyyətləri // Azərbaycan Onkologiya Jurnalı, -2022. №1, -s.90-91;
14. Ибишова, Л.М. Ситуационный анализ заболеваемости раком яичников в Азербайджанской Республике // Журнал экспериментальной, клинической и профилактической медицины, -2022. №3 (106), -с.68-75.

LIST OF ABBREVIATION

OC – ovarian cancer

GLOBOCAN – Global Cancer Observatory

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