ORIGINAL RESEARCH PAPER

Gynecology

OVARIAN CANCER BURDEN IN GEORGIA

KEY WORDS:

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ABSTRACT

Goal

1. To determine the incidence and death rates and features of ovarian cancer in the female population of Georgia in 2015-2019 using standardized rates and to create epidemiological maps.
2. To study the risks of cancer progression, recurrence and metastasis in oncogynecologic patients in the post-treatment period.
3. Study of 3-year survival rates of ovarian cancer.
4. To determine the burden of gynecologic cancer in the female population .
5. To develop preventive recommendations for oncogynecology patient advocacy.

METHODS

The following gross and standardized rates were calculated: Crude Morbidity and Mortality Rate (CrudeRate); Age-Specific Rate (Age-Specific Rate); Age-Standardized Rate (ASR); 95% confidence interval of Age-standardized Rate (95% CI ASR); Truncated Age Standardized Rate (TASR); 95% confidence interval of Truncated Age Standardized Rate (95% CI TASR); Age-Adjusted Rate (AAR); 95% confidence interval of age-adjusted rate (95% CI AAR); Standardized Rate Ratio (SRR); 95% confidence interval of standardized ratio ratios (95% CI SRR); Cumulative risk indicator (Cumulative Risk-CR_{64}, CR_{74},); 95% confidence interval of cumulative risk indicator (95% CI CR); Proportional Incidence Ratio (PIR); 95% confidence interval of proportional incidence ratios (95% CI PIR); Standardized Incidence Ratio (SIR); 95% confidence interval of standardized incidence ratio (95% CI SIR).

3-year survival rates for ovarian cancer were studied using SPSS, Kaplan-Maier curves, and Cox multifactorial analysis were used. Disability-adjusted life years (DALYs) in patients with gynecologic cancer were studied.

RESULTS

1. In the overall structure of cancer incidence in women, according to age standardized (ASR) rates per 100 000 women, in 2015-2019, the third most common site for gynecologic cancer in Georgia was cervical cancer (ASR = 13,4; 95% CI ASR = 12,8-14,1) , the fourth – uterine cancer (ASR = 11,3; 95% CI ASR = 10,8-11,9), and sixth - ovarian (ASR = 9,8; 95% CI ASR = 9,3-10.3) cancer.
2. In the overall structure of cancer incidence in women, by age-adjusted (AAR) rates per 100 000 women (Georgian Standard 2014), in 2015-2019, the fourth most common gynecologic cancer in Georgia was cervical cancer (AAR = 18,6; 95% CI AAR = 18,0-19,3), uterine cancer was the fifth (AAR = 18,5; 95% CI AAR = 18,0-19,1), and ovarian cancer the sixth (AAR = 15,1; 95% CI AAR = 14,6 -15 6).
3. In Georgia, the risks of recurrence and/or development of metastases and disease progression after the period of treatment and remission of cervical and uterine cancer are not statistically significantly different from each other (OR = 1,0, 95% CI OR = 0,7-1,4), while compared to the cervical and uterine cancer, the risk of ovarian cancer progression is 2,9 times higher (OR = 2,9, 95% CI OR = 2,1-3,9).The risk of recurrence and / or development of metastases and disease progression post-therapy and remission is 2,3 times higher for uterine cancer compared to cervical cancer in Tbilisi (OR = 2,3, 95% CI OR = 1,4-3,9). At the same time, compared to cervical and uterine cancers, the risk of ovarian cancer progression is 4,1 times and 1,8 times higher, respectively (OR = 4,1, 95% CI OR = 2,4-6,8; OR = 1 ,8, 95% CI OR = 1 2-2 7).
4. In Tbilisi (the capital city of Georgia), the 3-year survival rate of gynecologic cancer with Kaplan-Meyer curves averaged 70,5%. Better 3-year survival rates among gynecologic cancer localizations were observed in cases of uterine cancer (78,7%) and cervical cancer (75,2%).The 3-year survival rate for ovarian cancer was 55,2%.
5. According to the DALYs index of gynecologic cancer in Georgia and Tbilisi, 39 459,1 women/year were lost due to gynecologic cancer in Georgia in 2015-2019, each patient lost an average of 7,3 years, and in Tbilisi, respectively 11 521,3 women/year is lost, each patient lost an average of 5,8 years.

INTRODUCTION

According to the International Agency for Research on Cancer (IARC, Lyon), by 2020, 5,1 million cases of gynecologic cancer and 2,9 million deaths were registered, while the global burden of gynecologic cancer is 19%. The structure of gynecologic cancer incidence rates and deaths from the disease in 2020 is as follows:

- Cervical cancer - 493 000 new cases, 273 000 deaths;
- Uterine cancer - 199 000 new cases, 50 000 deaths;
- Ovarian cancer - 204 000 new cases, 125 000 deaths;
- Vaginal cancer, vulva and chorinocarcinoma comprises 45 900 new cases taken together.

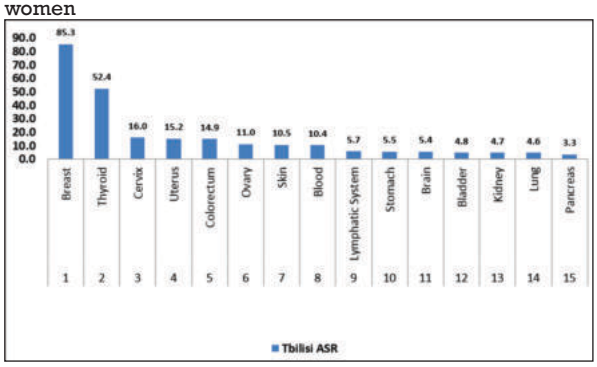
A large proportion of gynecologic cancers come from developing countries. Therefore, it is necessary to develop a cancer control policy in order to implement cancer advocacy and alleviate the global burden of the disease in developing countries.

Using the burden of gynecologic cancer and socio-economic indicators, it is possible to determine the financial losses or gains associated with the improvement or deterioration of women's health, which is so important for a developing country like Georgia.

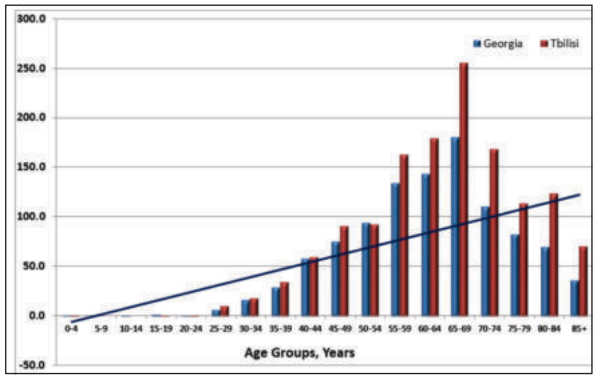
According to the NCDC, in 2019, a total of 10,339 new cases of all cancers were registered in Georgia (incidence rate per 100 000 population - 277,9), including 4 578 cases (44,3%) in men and 5 761 cases (55,7%) in women.

According to the Georgian Cancer Population Register, a total of 11 695 cases of cancer were registered in the female population of Tbilisi in 2015-2019. The structure of cancer incidence by Age- Standardized rate (ASR) by primary site is shown in Figure # 1.

Figure 1. Structure of 15 most common sites for cancer in Tbilisi according to age standardized rates (ASR) per 100 000 women



The peak of gynecologic cancer in Tbilisi falls on the age group of 45-74 years, ie pre- and especially postmenopausal (50-74) periods. In pre- and postmenopausal women in Tbilisi, the truncated age-standardized rate (TASR) is particularly high for uterine cancer ($TASR_{45-74}$ = 56,4% $_{000}$), and ovarian cancer, especially at the age of 50-74 ($TASR_{50-74}$ = 174). , 7% 000), incidence levels (Figure 2). The incidence of gynecologic cancer increases 4,5 times in Georgia with the ratio of $TASR_{45-74}$, and 6 times in Tbilisi, and increases 5,5 times in Georgia with the ratio of TASR50-74, 6,1 times in Tbilisi.



The annual mortality rate due to gynecologic cancer in Tbilisi in 2015-2019 was 17 5%$_{000}$ (Table # 4). According to the ASR, ovarian cancers is on the first place in the structure of deaths due to gynecologic cancer in Tbilisi, therefore, it is the # 1 killer location of gynecologic cancer (ASR = 66,3%$_{000}$), 2nd place - cervical cancer (ASR = 5,1%$_{000}$), and 3rd place - uterine cancer (ASR = 4,5%$_{000}$).

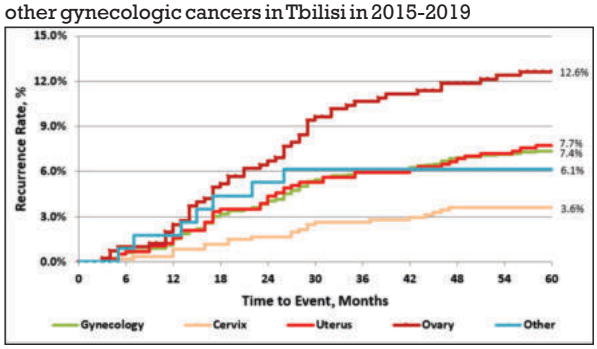
Table 4. Structure of deaths due to gynecologic cancer in Tbilisi in 2015-2019 according to age standardized rate (ASR)

#	Location	ICD code	Tbilisi
1	Ovary	C56.9	6,3
2	Cervix	C53.0 - C53.9	5,1
3	Ovarian body	C54.0 - C54.9	4,5
4	Vulva	C51.0 - C51.9	0,9
5	Vagina	C52.9	0,2
6	Uterine and genital organs, unspecified	C55.9; C57.0-57.9	0,6
	Total, gynecologic cancer		17,5

Source: (research materials)

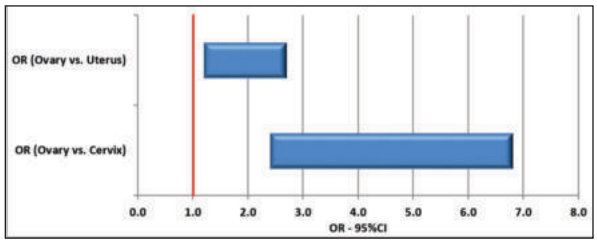
In the post-treatment period of gynecologic cancer in Tbilisi, the risks of disease progression, recurrence and spread of the disease by Kaplan-Meyer curves, the probability of recurrence (as an event) 60 months after the incident is 7,4% for gynecologic cancer, 3,6% for cervical cancer, 7,7% for uterine cancer, 12,6% for ovarian cancer and 6,1% for other gynecologic cancers. The risk ratio estimated by the Cox model was found to be reliable only for the risk of progression of ovarian cancer and other gynecologic cancers (Figure 4).

Figure 4. Kaplan Meyer curves of progression and recurrence of gynecologic, cervical, uterine, ovarian and other gynecologic cancers in Tbilisi in 2015-2019



In Georgia, the risks of recurrence and / or development of metastases and disease progression after the period of treatment and remission of cervical and uterine cancer are not statistically significantly different from each other (OR = 1,0, 95% CI OR = 0,7-1,4), while compared to the cervical and uterine cancer, the risk of ovarian cancer progression is 2,9 times higher (OR = 2,9, 95% CI OR = 2,1-3,9).

Figure 6. Risk of recurrence of ovarian cancer in Tbilisi compared to the probability of recurrence of cervical and uterine cancer



Thus, according to the DALYs index of gynecologic cancer in Georgia and Tbilisi, 39 459,1 women/year were lost due to gynecologic cancer in Georgia in 2015-2019, each patient lost an average of 7,3 years, and in Tbilisi, respectively 11 521,3 women/year is lost, each patient lost an average of 5,8 years.

Conclusion and recommendation

1. Based on the results of descriptive and analytical epidemiological study of gynecologic cancer incidents and the burden of death due to cancer in the female population of Tbilisi(capital city og Georgia) in 2015-2019, on the grounds that the # 1 site identified for a gynecologic cancer - uterine body, and the # 1 killer site – ovary, involved in the National Screening and Early Detection Program, it is recommended to modify the screening and diagnostic program and prepare regional and municipal programs.
2. The structure of death due to gynecologic cancer was first established. Both in Georgia and in Tbilisi, ovarian cancer ranks first in the structure of death due to gynecologic cancer and, consequently, is the # 1 killer sites for gynecologic cancer.
3. In order to increase the effectiveness of gynecologic cancer screening, it is recommended to raise the awareness of female population (to increase the coverage of the population by screening) and the training in gynecologic cancer screening and early diagnosis for public health network family doctors, gynecologists and managers involved in cancer control programs will enhance the effectiveness of the screening program.
4. In order to advocate for gynecological cancer control, it is recommended to develop regional and municipal screening programs according to the cancer epidemiological maps and to provide effective screening services for each woman according to the state program prevention guideline.
5. In case of detection of tumor ovarian mass by ultrasound

at first step in pre- and especially postmenopause (50+), the second step is the detection of ROMA (ROMA-Risk of Ovarian Malignancy Algorithm) index, which aim at detection of cancer antigen 125 (CA125) and human epididymal protein 4 (HE4) amounts in the patient's serum. A ROMA index of more than 1,14 in premenopause and more than 2,99 in postmenopause indicates a higher risk of ovarian epithelial cancer (Lee-may Chen et al., 2021).

REFERENCE

1. Boyle, P., &Levin, B. (2008, December 12). World cancer report 2008. Lyon: International Agency for Research on Cancer.Retrieved December 15, 2008, from: https://publications.iarc.fr/Non-Series-Publications/World-Cancer-Reports/World-Cancer-Report-2008
2. International Agency for Research on Cancer. GLOBOCAN 2008 Fast stats. (2012, April 20) Retrieved April 24, 2012, from: http://www.globocan.iarc.fr/.
3. https://seer.cancer.gov/
4. International Agency for Research on Cancer (IARC, Lyon), by 2020
5. Lee-may Chen et al., 2021
6. www.ncdc.ge