Cervical cancer – statistical analysis data in a 5year period in Strumica and Republic of North Macedonia

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Abstract

Cervical cancer is a disease in which the cells of the cervix become abnormal and begin to grow uncontrollably, forming cancer. For the purposes of this paper was used data from the Institute for Public Health of Republic of North Macedonia in the period of 2001 to 2017 and data from the Center for Public Health – Strumica, Republic of Northern Macedonia in the period of 2013 to 2017. The results show that the total number of cases of cervical cancer registered over a period of ten years is 2451, average number of patients is 245.1 per year. The highest number of registered cases of cervical cancer occurred in 2001 with 387 cases and the lowest number of registered cases was in 2007 when 218 patents were registered. In Strumica for period of 5 years 45 women were diagnosed with cervical cancer. Highest number of women diagnosed with cervical cancer is in 2014ie 19 patients and the lowest number of patients with cervical cancer is in 2017. The youngest patient with cervical cancer in Strumica is at the age of 39 and the oldest is at age of 82. The number of registered women with cervical cancer is much higher or more than 80% of cases in underdeveloped countries than in developed countries.

Keywords: cancer, cervix, pathology, statistic

I. INTRODUCTION

Cervical carcinoma has a slow progression. The average period of transition of pre- cancerous lesion in invasive carcinoma, if it is not treated is from 10 to 12 years. First appears a cervical intraepithelial neoplasia, CIN 1, CIN 2 and CIN 3.If the neoplasia is not treated, it develops into CIS (carcinoma in situ) and in the end it becomes invasive carcinoma. Cervical cancer is the second most common malignant disease in women with over 500,000 newly registered cases each year.

In terms of etiology, there are numerous risk factors for cervical cancer like HPV, herpes virus infection and chlamydia trachomatis, the number of sexual partners, age of first sexual intercourse, menstrual and reproductive factors, genital hygiene, circumcision, smoking, social status, religion, genetic factors, deficiency of vitamin A, C and E and folic acid, oral contraceptives and other. HPV infection with herpes virus and clamydia trachomatis that act as co-factors, are responsible for the onset of cervical dysplasia and carcinogenesis. HPV infection is found in 99% of women with squamous cell cervical cancer.There are more than 130 different types of HPV, of which, more than 30 can affect the lower genital tract. HPV genotypes are divided into high-risk and low-risk.

Patients with cervical cancer may have local or systemic symptoms. In about 90% of cervical cancer patients the disease is manifested by the presence of local symptoms. The most common symptom in cervical cancer patients is vaginal bleeding. Most often bleeding is post-coital but may also occur as irregular or postmenopausal bleeding. Bleeding is usually scarce and usually occurs after sexual intercourse, irritation or gynecological examination. Other local symptoms in cervical cancer are manifested by pelvic, spine and leg pain, swelling of the lower extremities may occur, thrombophlebitis, urinary symptoms like frequent urination, burning while urinating, hematuria, fistulas, urethral obstruction with or without hydroureterand hydronephrosis and symptoms of extra-pelvic metastases. Systemic signs and symptoms are rare compared to local ones.Lymphadenopathy may occur,also pulmonary nodules which occur less frequently. The golden standard for diagnosis is by histopathological analysis of biopsy material and endo-cervical curettage.

The treatment of cervical cancer depends mainly on the stage of the disease. In the early stages of the disease, operative treatment is the treatment of choice. In the more advanced stages, there are combinations of chemotherapy and radiotherapy.In disseminated cases, radiotherapy allows palliation of symptoms.

There is no standard follow-up scheme for patients after the treatment. It is recommended the patients to be monitored after treatment every three months during the first year, every four months during the

second year, six months in the next three years and then once a year, depending on the symptomatology and routine examinations.

There are two ways of preventing cervical cancer: primary prevention through HPV vaccination to prevent infection and secondary prevention through cervical screening to detect precancerous lesions and their treatment before they develop into cancer. [1-8]

II. MATERIAL AND METHODS

The frequent incidence of cervical cancer in women, the possibility of early detection through screening and the risk of mortality have defined the purpose of this study. In the research were analyzed the number of registered cases of cervical cancer,the number of deaths of cervical cancer patients, the number of PAP tests performed, the number of cytologically analyzed PAP tests and the number of detected cell abnormalities.

For the statistical analysis were obtained information from:

- Data from the Institute of Public Health of the Republic of Macedonia for the period 2001 -2010.
- Data from the Institute of Public Health of the Republic of Macedonia for the period 2012-2017
- Data from the State Statistical Office of the Republic of Macedonia for the period 2008-2016
- Data from the Strumica Public Health Center for the period 2013-2017

The results are processed in detail, analyzed and statistically presented in the paper in tables, graphs and images.

III. RESULTS AND DISCUSSION

Table 1. Total number of deceased women from cervical cancer in Macedonia for a period of nine years.

	Total number of deceased women from cervical cancer in Macedonia for a period of nine years.
2008	43
2009	35
2010	31
2011	15
2012	39
2013	36
2014	42
2015	39
2016	47

Table 1shows the total number of deceased women with cervical cancer on the territory of the Republic of Macedonia for a period of nine years from 2008 to 2016. Data are obtained from the State Statistical Office of the Republic of N. Macedonia. From these data it can be notice that the total number of

deceased women in the period from 2008 to 2016 is 327. On average, 36 women died each year. The highest rate of cervical cancer mortality is in 2016 with 47 women ie 14%, and the lowest mortality rate has in 2011 with 15 women ie 5%. The absolute number of women who died from cervical cancer for the period 2008-2016 is slightly increasing.

Table 2. Number and rate of registered cases of cervical cancer in the Republic of Macedonia for a period of ten years from 2001 to 2010.

Year	Number of deceased women from cervical cancer	Rate /100 000
2001	387	38.0
2002	210	20.9
2003	248	24.6
2004	226	22.3
2005	221	21.8
2006	263	25.9
2007	218	21.4

2008	222	21.7
2009	226	22.7
2010	230	22.4

In table 2 areshown the number and rate of registered cases of cervical cancer in the Republic of N. Macedonia for a period of ten years - from 2001 to 2010. According to this data, the incidence of malignant neoplasm of the cervix in the Republic of N. Macedonia in the period 2001-2010 tends to decrease. Total number of registered cases with cervical cancer for this period is 2451 cases. The highest number of registered cases of cervical cancer occurred in 2001 with 387 cases or the rate of 10,000 women was 38.0. The lowest number of registered cases is in 2007 with 218 cases or the rate of 10,000 women was 21.4.

Table 3. Number of PAP tests done by age groups on the territory of Macedonia through organized screening program for the period 2012-2017.

Year	Number of woman on that age	Age group 1	Age group 2	Number of Pap tests	% of women who make Pap test
2012	188178	24-35		17595	9.4%
2013	189588	36-48		20612	10.9%
2014	150736(I group)	49-60	36-48	26270	17.4%
2015	554615	24-35	36-60	29887	5.4%
2016	547032	36-45	24-60	29118	5.3%
2017	361414 (35-59)	46-60	36-45	27138	7.5%

In table 3 are shown results for the number of PAP tests done through organized screening program on the territory of Republic of N. Macedonia in the period from 2012 to 2017. According to the data shown, we can conclude that the total number of PAP tests is 150620 of totally 1991563 patients who are on that age or 7.6%. The highest number of PAP tests done are registered in 2015, with total 29887 registered tests and the lowest number of PAP tests done in 2012 with 17595 registered tests. In 2017 the total number of women being checked is 27138 or 7.5%, which is a 6.8% decrease from the previous year 2016 when 29118 PAP tests were done. Of these 27138 patients, 7179 are on age of 36-45 and 19959 are on age of 46-60. Total number of women checked in 2016 is 29118. Of these, 20,336 or 5.6% were women at the age of 36-45, while 8762 or 13.8 were at the age of 24-60.

Table 4. Table of the number of cytological analyzed PAP, and the percentage of cell abnormalities detected in R.M in the period between 2012 to 2017.

Year	Number of women on that age	Age group 1	Age group 2	Cytological analyzed	% detected cellular abnormalities
2012	188178	24-35		15609	8%
2013	189588	36-48		16573	7%
2014	150736	49-60	36-48	24225	3.8%
2015	554615	24-35	36-60	26668	2.5%
2016	547032	36-45	24-60	37589	14.9%
2017	361414	46-60	36-45	32162	11.9%

Table 6 shows the number of cytologically analyzed PAP tests and the number of detected cellular abnormalities in the Republic of N. Macedonia for a period of six yearsie 2012 to 2017. Data are obtained from the Institute of Public Health of the Republic of N. Macedonia. Most of the cytologically analyzed PAP tests were done in 2016 with 37589 analysis and the lowest number of cytological tests were done in 2012 with 15609 analysis. The highest number of cell abnormalities, ie 14.9% were detected in 2016, and the lowest number of cell abnormalities were detected in 2015 with 2.5%. According to these data, in 2017, 31262 specimens were cytologically analyzed, which means there is 17% decrease. In 2016 a total of 37589 swabswere registered. In 2017 were detected 11.9% cellular abnormalities, while in 2016 - 14.9%.

In the age group of 36-45 years, 4548 swabs were cytologically analyzed. Of these, 1765 had cell abnormalities, or 38.8%. In the age group of 46-60 years,26714 were cytologically analyzed. Of these samples in 1964, were detected cellular abnormalities, or 7.4%. According to this we can conclude that in the age group of 46 to 60, percentage of detected cell abnormalities is significantly lower by 31.8% in relation to the age group of 36-45 years.

Table 5. Number of cytologically analyzed liquid and percentage of detected cellular abnormalitiesin patients from 46 to 60 years old in 2017 according to the Centers for Public Health.

Center for Public Health	cytologically analyzed liquid	% of detected cellular abnormalities
Bitola	1916	4.5%
Gevgelija	1411	11.7%
Gostivar	1172	0.2%
Kavadarci	1850	2.6%
Kochani	1188	3.4%
Kumanovo	5891	12.3%
Ohrid	714	3.9%
Prilep	0	0
Tetovo	490	0
Skopje	8267	1.8%
Strumica	2665	10.0%
Shtip	193	7.8%
Veles	1320	46.1%
Total:	26714	7.4%

In Table 5are shown the data for the number of cytologically analyzed swabs and the percentage of detected cell abnormalities. in patients aged 46 to 60 years in 2017 according to the Centers for Public Health. The total number of cytological analyzes done for 2017 is 26714. Most of the cytologically analyzed swabs are registered in Skopje with 8267 analyses, then inKumanovo - 5891 analyzes. In Prilep no smear analyzes were done. Stip is the second city with the lowest number of smears - 193, and Ohrid is the third with 714 analyzes.

The total number of detected epithelial cell abnormalities is 7.4%.Most of the epithelial cell abnormalities were registered in Veles with 46.1%, Kumanovo with 12.3% and Gevgelija with 11.7%.

Table 6. Number of women diagnosed with cervical cancer in Strumica in 2013, 2014, 2015, 2016 and 2017.

Year	Number of women diagnosed with cervical cancer
2013	8
2014	19
2015	11
2016	4
2017	3

Table 6shows the total number of women diagnosed with cervical cancer over a period of five years in Strumica. Data are taken from the Public Health Center - Strimica. In Strumica in the period of five years ie 2013, 2014, 2015, 2016 and 2017 total 45 women were diagnosed with cervical cancer, the average for this time period is 9 affected women per year. Most women diagnosed with cervical cancer are in 2014, with 19 cases. The lowest number of women diagnosed with cervical cancer is in 2017 with 3 cases. From the total number of data it can be noticed that in the last 2 years the number of women with cervical cancer has decreased. Of the total number, 42% of diagnosed are in 2014, 24% are in 2015, 18% in 2013, 9% in 2016 and 7% in 2017.

Table 7. Number of diagnosed women with cervical cancer in Strumicadivided by age for a period of five years.

Age	Number of diagnosed women with cervical cancer
82	1
80	1
75	1
73	2
71	2
70	1
69	1
68	3
67	2
65	1
64	2
63	2
62	1
61	1
60	3
59	1
58	2
57	3
56	2
54	1
53	1
52	1
51	1
49	1
48	2
46	1
45	1
43	1
40	1
39	2

From the data shown we can notice that the oldest women with cervical cancer is 82 years old and the youngest one is 39 years old. The average age for cervical cancer is 60 years.

Table 8. Number of cytologically analyzed PAP tests and number of detected cellular abnormalities in Strumica for a period of two years 2016 and 2017.

Year	2016	2017
Age	36-45 years	46-60 years
Number of PAP test	2669	2665
Number of negative tests	2358	2399
Number of positive tests	311	266
ASC-US	71	85
ASC-H	15	5
HPV	119	103
CIN 1	74	51
CIN 2	27	11
CIN 3	3	1
CIS		
Squamous cell carcinoma suspected for invasion		3
Invasive squamous cell carcinoma		3
AGC	2	1

Adenocarcinoma in situ	2	
Cervical adenocarcinoma		
Adenocarcinoma nonspecific otherwise NOS	1	
Another malignant neoplasm		

Table 8 shows the number of cytologically analyzed PAP tests and the number of detected cell abnormalities in Strumica, for the period of two years 2016 and 2017. Data are taken from the Center for Public Health – Strumica. According to these data it can noticed that in 2016 were done 2669 cytologically analyzed PAP tests. The patients were aged from 36 to 45 years. Of the 2669 cytological analyzes, 2358 were negative or 88%, 311 were positive, or 12%.

In 2017, a total of 2665 tests were done, of which 2399 or 90% were negative and 311 or 10% were positive.The screening revealed 9 cases of cancer, of which 3 squamous cell carcinomas suspected for invasion, 3 invasive squamous cell carcinomas, 2 adenocarcinomas in situ and 1 adenocarcinoma unspecified. All cancers were detected in 2017.

Of the total number of pathological lesions most commonly diagnosed were with HPV (119), CIN 1 (71), ASC-US (71) and CIN 2 (27) for 2016, patients were aged 36 to 45 years.

While in 2017 also the most commonly diagnosed pathological lesion was HPV (103), second is ASC-US (85), third is CIN 1 (51) and CIN 2 (11).

IV. CONCLUSION

Cervical cancer is one of the most common malignant disease in women. The main cause of cervical cancer is the presence of the Human Papilloma Virus. The number of newly registered cases of cervical cancer, as well as the number of deceased women with cervical cancer in Republic of North Macedonia tends to decline. The reason for this tendency is the introduction of cervical cancer prevention.

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