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EPIDEMIOLOGICAL CHARACTERISTICS OF MALIGNANT DISEASES OF MALE POPULATION IN THE JABLANICA DISTRICT AND CENTRAL SERBIA

Goran Cvetanović, Marija Stojiljković, Mirjana Miljković, Nebojša Dimitrijević

General Hospital, Leskovac, Serbia

Aging population and the increasing exposure to carcinogens contribute to the rise of the global cancer incidence. Around 70% of all death cases caused by malignant diseases are in countries with low and medium incomes.

The aim of this study was to monitor the trends of mortality and morbidity for cancers, with the highest incidence amongst men in the Jablanica district during the period 1999-2009 and to determine if the cancer incidence and mortality in men of the Jablanica district correlate with the same parameters of men from central Serbia.

The source of data used for this study is the report "Incidence and cancer mortality in Central Serbia" for the years 1999, 2004 and 2009, published by the Public Health Institute of Serbia. The differences in cancer incidence and mortality for the Jablanica district and central Serbia were examined using the chi-square test.

Men from the Jablanica district territory are more likely ($p<0.05$) to develop lung, colorectal, bladder and oral cavity cancers than their counterparts in central Serbia. In addition, the incidence of all cancers (excluding skin cancers) in men in the Jablanica district is higher than that of men in central Serbia. Men from the Jablanica district territory are more likely ($p<0.05$) to die of lung cancer than their counterparts in central Serbia.

As the number of newly diagnosed cases increased during the observed period, and that further incidence increases are expected, it is necessary to implement preventive and screening programs which should primarily include high risk groups and then broader population. *Acta Medica Medianae 2014;54(1): 40-47.*

Key words: *lung cancer, colorectal cancer, prostate cancer, bladder cancer, laryngeal cancer, oral cancer*

Contact: Marija Stojiljković
General Hospital, Leskovac, Rade Končara 9, Serbia
E-mail: marijastojiljkovic986@gmail.com

Introduction

The World Health Organisation defines malignant diseases as a malignant tissue mass whose growth is not caused by physiological needs of a tissue or an organ affected by pathological process and whose main characteristics are uncontrolled growth, the capacity of penetrating into surrounding tissue and possibilities of spreading (metastasis) to other tissues and organs that are often distant (1).

Cancer is the leading cause of mortality in the world. During 2008, malignant diseases were the cause of death of 7.6 million people (which is around 13% of the mortality in the world). Around 70% of all death cases caused by malignant diseases are in countries with low and medium incomes. It is considered that by 2030 cancer will have been the cause of death of about 13.1 million cases in the world (1). Predictions are that, even if the global rate of cancer stays the same, the number of newly diagnosed from 12.7 million in 2008 will increase to 21.4 million in 2030, and that 2/3 of the total number of cancer will be in countries with low and medium incomes (2).

Except for the hereditary predispositions, many cancerous agents of the environment are included in the processes of oncogenesis. Stressful and fast life style, alcohol consumption and nicotine, poor physical activity, obesity, nutrition rich in fat and cholesterol and poor in fruit, vegetables and cereals, unhealthy way of food preparing (preserving, smoking, use of food additives), air pollution, heavy metals, viruses are also factors of risk for the appearance of malignant diseases (3-13).

In view of the fact that the number of newly diagnosed cases is expected to increase, it is necessary to indicate the most frequent localizations of malignant tumours in the population of a certain area, and to direct preventive measures and early detection primarily to localizations of malignant tumours.

Aims

The aim of this research was to show and monitor the development of illnesses and dying from malignant tumours with the highest incidence among men in the Jablanica district from 1999 to 2009 and to establish whether there are significant differences in the rate of morbidity and mortality among men between the Jablanica district and Central Serbia.

Materials and methods

This is a retrospective study of a descriptive character.

The data from the Institute of Public Health of Serbia "Dr Milan Jovanovic Batut" from the report "Cancer incidence and mortality in Central Serbia" in 1999, 2004 and 2009 were used as data resource for the basic analysis (14-16). Information resources about the deaths from cancer are the data from the Institute of oncology, oncology of out-patient departments, clinics, hospital and outpatient health facilities, histopathological/cytological, haematological and other laboratories, death reports, health research funds. The data was collected by using the Population Register for Cancer which has the registrations for this district; the data basis for Central Serbia is in the Institute of Public Health of Serbia.

The number of newly diagnosed cases has been observed; the incidence rates, the morbidity rate, the mortality rate for malignant tumours have been standardized with the greatest incidence in male population (lung and bronchi cancer, colons and rectums, prostate, bladder, stomach, laryngeal, oral cavity and pharynx) in Central Serbia and Jablanica district. The listed rates have been standardized by the method of direct standardization, and the world population (ASR-W), European(ASR-E) and truncated population (ASR-TRUNC) have been used as the standard population.

The data is shown in tables.

The differences in the morbidity and mortality rate for men in the Jablanica district and Central Serbia from the cancer with the greatest incidence were tested by statistic test of significance $\chi 2$. The values $p<0.05$ are taken as statistically significant.

Results

During the observed ten-year period in male population, the morbidity and mortality among newly diagnosed patients from different site-specific cancers (without skin) increased in Central Serbia and Jablanica district. The incidence rate of the total number of different site specific cancers (except for skin cancer) from 2004 to 2009 increased more in the Jablanica district in comparison to the value increase in Central Serbia during the same period. The total number of morbidity for men from site specific cancers cancer (except for skin cancer) from Jablanica district was significantly higher than the total rate of morbidity for men in Central Serbia in the observed period ($\chi 2=27.49$ $p<0.01$) (Table 1).

In the observed period, the mortality rate of cancer increased among men in Jablanica district and in Central Serbia as well. The mortality rate among men from site specific cancers (except for skin cancer) in Jablanica district was not significantly higher than the mortality rate for men in Central Serbia in the same period ($\chi 2=1.57$ $p>0.01$) (Table 2).

Lung and bronchial cancer (C 34)

In the observed period, the morbidity rate and the incidence rate in Central Serbia and Jablanica district increased in male population. The values of the incidence rate for Jablanica district were not higher than the values for Central Serbia, but it is noted that, from 2004 to 2009, in Jablanica district the incidence rate increased more than in Central Serbia. The morbidity rate among newly diagnosed lung cancer men in Jablanica district was significantly higher than the number in Central Serbia in the observed period ($\chi 2=5.71$ $p<0.01$) (Table 2).

Colon and rectal cancer (C 18-C 20)

The morbidity and incidence rate among men was in the constant growth in Central Serbia and in Jablanica district as well. From 2004 to 2009, it is noted that in Jablanica district there was a higher growth of incidence rate in comparison to the same period in Central Serbia where the growth was more abstinent. The morbidity in newly diagnosed men with colon and rectal cancer in Jablanica district was statistically and significantly higher in comparison to the morbidity in newly diagnosed men from Central Serbia in the observed period ($\chi 2 =21.76$ $p<0.01$) (Table 1).

The morbidity and mortality rates also had the growing tendency in Central Serbia as well as in Jablanica district. The number of men who died from colon and rectal cancer in Jablanica district was not statistically and significantly higher than the number of men who died in Central Serbia in the observed period ($\chi 2=1.45$ $p>0.01$) (Table 2).

Prostate cancer (C 61).

The incidence and mortality rate for Central Serbia and Jablanica district in the observed period showed some growth. The number of newly

cancer in Jablanica district was higher than the incidence in Central Serbia, but in 2004, these values dropped in Jablanica district (9.5) and they increased in Central Serbia (17.2). In 2009, the incidence rate slightly dropped in Central Serbia (16.3) and increased in Jablanica district (17.3). The morbidity rate for men with bladder cancer in Jablanica district was statistically significantly higher in comparison with the morbidity among newly diagnosed men from Central Serbia in the observed period ($\chi2=8.72$ $p<0.05$) (Table 1).

The mortality rate did not change significantly in Central Serbia and in Jablanica district as well, in spite of the increased number of the diagnosed. The number of men who died from bladder cancer in Jablanica district was not statistically significantly higher than the number of men in Central Serbia in the observed period ($\chi2=4.96$ $p>0.01$) (Table 2).

Gastric cancer (C 16)

The incidence rate in Central Serbia dropped during the observed period, whereas it increased (19.1) in the Jablanica district during 2004, and then dropped (13.4) in 2009. During the observed period, the incidence rates in Jablanica district were always higher than the values of incidence in Central Serbia. The morbidity of men with gastric cancer in Jablanica district was not statistically significantly higher when compared to the number of men in Central Serbia in the observed period ($\chi2=1.42$ $p>0.01$) (Table 1).

In 1999 and 2004, the mortality rates were higher than the values for Central Serbia, whereas they dropped in 2009. The mortality for gastric cancer in Jablanica district was not statistically significantly higher than the one in Central Serbia in the observed period ($\chi2=1.13$ $p>0.01$) (Table 2).

Laryngeal cancer (C 32)

Both morbidity and incidence rate increased in Central Serbia and Jablanica district in male population during the observed period. The incidence rates in Jablanica district (12.3) were higher than the values obtained for Central Serbia (11.6) in 2009. The morbidity of men with laryngeal cancer in Jablanica district was not statistically significantly higher than the number of men in Central Serbia in the observed period ($\chi2=2.17$ $p>0.01$) (Table 1).

Table 1. The number of newly diagnosed and incidence rate for the most common localizations of malignant diseases in male population

Malignant diseases localization	Year	Central Serbia		Jablanica district		Test
		Number of newly diagnosed	Incidence rate	Number of newly diagnosed	Incidence rate	
Lung and bronchi C34	1999	2260	51.2	72	34.1	$\chi2=11,16$ $p<0,05$
	2004	2899	63.8	76	39.3	
	2009	3183	69.9	132	66.5	
Colon and rectum C18-C20	1999	1225	26.6	39	18.6	$\chi^2=21.76$ $p<0.05$
	2004	1590	33.1	22	11.8	
	2009	1693	35.7	69	32.7	
Prostate C61	1999	662	13.2	21	9.3	$\chi^2=0.45$ $p>0.05$
	2004	1073	19.9	34	14.1	
	2009	1673	29.8	60	21.7	
Bladder C67	1999	583	12.5	30	13.4	$\chi^2=8.72$ $p<0.05$
	2004	831	17.2	19	9.5	
	2009	789	16.3	34	17.3	
Stomach C16	1999	599	13.2	30	14.6	$\chi^2=1.42$ $p>0.05$
	2004	616	12.8	40	19.1	
	2009	536	10.9	34	13.4	
Larynx C32	1999	464	10.9	15	8.2	$\chi^2=2.17$ $p>0.05$
	2004	516	11.7	22	11.6	
	2009	506	11.6	26	12.3	
Oral cavity and pharynx	1999	317	5.1	13	4.1	$\chi^2=7.78$ $p<0,05$
	2004	309	7.0	5	7.5	
	2009	341	7.5	20	8.9	
All localization without skin	1999	9048	208.7	314	160.5	$\chi^2=27.49$ $p< 0.05$
	2004	11393	255.7	353	190.0	
	2009	12333	271.1	536	261.6	

Table 2. The number of dead and mortality rate for the most common localizations of malignant diseases in male population

Malignant diseases localization	Year	Central Serbia		Jablanica district		Test
		Number of dead	Mortality rate	Number of dead	Mortality rate	
Lung and bronchi C34	1999	2032	44.7	61	30.3	$\chi2=5.71$ $p<0.05$
	2004	2284	49.0	76	36.0	
	2009	2566	53.9	109	52.4	
Colon and rectum C18-C20	1999	751	15.8	23	10.0	$\chi2=1.45$ $p>0.05$
	2004	887	17.5	22	9.9	
	2009	1054	19.8	36	15.1	
Prostate C61	1999	451	8.9	13	5.7	$\chi2=2.02$ $p>0.05$
	2004	564	9.7	26	9.7	
	2009	720	10.8	28	9.8	
Bladder C67	1999	266	5.4	15	6.8	$\chi2=4.96$ $p>0.05$
	2004	299	5.6	8	3.3	
	2009	312	5.3	8	3.7	
Stomach C16	1999	545	11.7	29	13.7	$\chi2=1.13$ $p>0.05$
	2004	566	11.4	31	14.3	
	2009	548	10.7	23	9.9	
Larynx C32	1999	314	11.7	10	8.2	$\chi2=3.04$ $p>0.05$
	2004	278	6.0	14	6.7	
	2009	292	6.1	18	8.7	
Oral cavity and pharynx	1999	134	5.0	5	4.1	-
	2004	-	-	-	-	
	2009	-	-	-	-	
All localization without skin	1999	6923	152.4	251	123.3	$\chi2=1.57$ $p>0.05$
	2004	7664	159.3	301	142.9	
	2009	8447	168.5	338	157.3	

The mortality rate in Central Serbia dropped in comparison to the one obtained for 1999, whereas in Jablanica district it increased and was above the values for Central Serbia. The mortality of men who died from laryngeal cancer in Jablanica district was not statistically significantly higher than the number of men in Central Serbia in the observed period ($\chi2=3.04$ $p>0.01$) (Table 2).

Oral cavity and pharyngeal cancer (C 00 - C 10)

During the observed period, the incidence rate in Central Serbia and Jablanica district increased. The incidence rate in Jablanica district surpassed the values for Central Serbia in 2004 and 2009. The morbidity among newly diagnosed men with oral cavity and pharyngeal cancer in the Jablanica district is statistically and significantly higher than the number in Central Serbia in the observed period ($\chi2=7.78$ $p<0.05$) (Table 1).

Discussion

The incidence rate of all cancers (except for non-melanoma cancer) among men in the world is 202.8, whereas in Europe that value is higher (292.9). Serbia has lower values of incidence rate (238.5) than Europe and countries in the region (Romania 240.6, Croatia 315.0, Macedonia 262.1, Bulgaria 252.9, and Hungary 352.3)(17). In Jablanica district, according to the data obtained in 2009, the values of incidence rate were 261.6, which is less than the values for Central Serbia (271.1) Serbia, Europe and other countries in the area (16).

Although incidence rates are lower than the values for Europe and countries in the area, the fact that concerns all is that the values of mortality rate in our country are bigger than in European, world's and some developed countries. The mortality rate among men in the world is 127.9, in Europe is 155.3, and in Serbia is 177.6 (17). This value for Jablanica district (157.3) (16) is higher than the world's and European values. These data can indicate that different site specific cancers in our country are discovered in late phases of disease when the possibility for cure is small. Accordingly, it is necessary to pay more attention to preventive activities, which include preventive examinations, screenings and education of the healthy population with the aim of an early detection when the possibility for cure is significantly higher.

Cancer with the highest incidence rate in male population is lung cancer. The world's incidence rate for this cancer in male population is 33.8 and it is higher in developed parts of the world (47.1) than in developing countries (27.6) (17). The European incidence rate (48.9) (6) is slightly higher than the world's, whereas in Serbia the incidence rate for lung cancer is 66.1 (17) which is higher than the world's and European incidence rates. Countries in the area also have the incidence rates which are higher than the world's and European ones (Croatia 60.0, Hungary 80.9, Macedonia 57.8, and Romania 54.6) (17). The values of the mortality rate in the world (29.2) and in Europe (42.5) are less than Serbia (60.1), including Central Serbia (53.9) and Jablanica district (52.4) (16).

Smoking is the most significant factor that contributes to the appearance of lung cancer. The research showed that 79% of the diseased are smokers (3). The research conducted during 2006 in the Republic of Serbia showed that 33.6 % of the residents used tobacco and 38.1% of them were men. Also, 61.7% of residents in Serbia were exposed to tobacco smoke in their house, whereas 44.9% were exposed to tobacco smoke at their work place (18).

Air pollution is also one of the factors that contribute to the appearance of lung cancer. Leskovac is a town with the medium level of pollution. Home heating greatly contributes to air pollution, especially during winter. The percentage of deviation from the limits of emission in Leskovac (controlled sulphur-dioxide, soot, nitrogen oxides, and total sediment matters) was 30.24% in 2012 (19).

Since this type of cancer has high rates in whole Serbia and in Jablanica district as well, it is necessary to make a plan in order to decrease the exposure to risk factors, to educate the population about the noxiousness of nicotine for human body, to take measures of occupation safety in chemical industries where noxious evaporations exist, and to take regular systematic examinations among the population with high risk.

The colon and rectum cancers is the second most common cancers among men. The world incidence rate of 20.3 is less than European 37.4 (17). The incidence rate in Serbia was 33.5 (17), and it is less than in Central Serbia (35.7) and higher than in Jablanica district (32.7) (16). Countries in the area which have higher incidence rates among men than Serbia are Croatia (44.4) and Hungary (56.4), and lower incidence rates have Macedonia (31.3), Romania (27.6) and Bosnia and Herzegovina (24.5) (17). The morbidity among newly diagnosed men in Jablanica district was statistically and significantly higher than the number in Central Serbia in the observed period.

The comparison of the values of mortality rate in the world (9.6), Europe (17.0),Serbia (21.1) (17), Central Serbia (19.8) and Jablanica district (15.1) (16) show that it is necessary to work on an early detection of cancer. Smoking, alcohol, physical inactivity, obesity, nutrition with many saturated fats and not enough vegetable fibres are factors that contribute to the appearance of colorectal cancer(13,19). During 2006, 44.0% of the adult population in Central Serbia consumed fruit and vegetables every day; 70.1% used white bread, and 40.3% consumed alcohol (18). In Jablanica district the meat is used in great amounts, and the most frequent way of its processing is smoking. Preparation of the food at the barbecue that has a long tradition in Jablanica district can be also significant for the appearance of malignant diseases of the gastrointestinal tract. As it is the cancer which can be detected early, it is necessary to run annual tests for the detection of the occult bleeding in stool in the population aged over 50 (20).

Cancer which has significantly higher incidence rate in Europe than in Serbia is prostate cancer. The world's (27.9) and European (59.3) incidence rates for prostate cancer are higher than the values in Serbia (18.9) (17). Also, that value is higher in Central Serbia (29.8) than in Jablanica district (21.7) (16). Countries in the area (Croatia, Bosna and Herzegovina, Hungary, Romania and Macedonia) have higher incidence rates than Serbia (17). The mortality rate in Serbia is 11.5 (17), whereas it is lower in Central Serbia (10.8) and Jablanica district (9.8) (16). In Germany, the incidence rate is high (82.7) but the mortality rate is 11.7 (17), which shows the efficiency of an early detection of prostate cancer via screening. The risk factors related to prostate cancer are age, genetic predisposition, race, overusing of fat and meat (4,12).

Since the prostate specific antigen (PSA) can serve for an early detection of cancer, it is necessary to include more and more men in the programme of screening, especially those who belong to a risk group (4).

The incidence of bladder cancer is also high among men. According to the latest data from the literature, the incidence rate in male population in Europe (16.7) is higher than the world's (8.9) (17). The values for Jablanica district are higher (17.3) than the values in Central Serbia (16.3) (16) and Serbia (12.3) (17). Countries in the area (Croatia 17.8, Hungary 19.4, Germany 19.6, Macedonia 27.3) (17) have higher incidence rates than Serbia and Jablanica district.

The world's mortality rate for bladder cancer in men is 3.3, in Europe 5.6, in Serbia 5.7, and in Jablanica district 3.7 (17). Jablanica district has high incidence rate for bladder cancer and the number of newly diagnosed men is statistically and significantly higher than the number in the territory of Central Serbia. As the countries in the area have higher incidence rates, it is necessary to perceive this problem more seriously and to expect the possible increase of morbidity among the newly diagnosed in Serbia and in Jablanica district as well. Industrial cancerous, aromatic amines, amines from the tobacco smoke,

consuming of alcohol, coffee, hereditary cysticurolithiasis, the presence of urinary catheter in the bladder are known as risk factors for bladder cancer. Among the diseased, 40-50% were smokers (5). Since the mine Lece is in the Jablanica district where ores of zinc and lead are exploited, the increased level of these heavy metals in nature can be one of the reasons for high incidence of bladder cancer in Jablanica district.

Gastric cancer is the cancer which had higher incidence rate among men in Jablanica district in comparison to central Serbia. High values of incidence rates of gastric cancer are found among the population in Jablanica district. The incidence rate in the world (19.7) is higher than in Europe (14.5), Serbia (12.0) (17), Central Serbia (10.9) and Jablanica district (13.4) (16). The mortality rates for gastric cancer among men in Jablanica district (9.9) and Central Serbia (10.7) (16) are lower than the values for Europe (11.3) and the world (14.2) (17).

The increased use of fat and proteins, salted meat and fish, the increased use of nitrates (additives, preserving), vitamin A and C deficits, smoking-dry meat, drinking water rich in nitrites, smoking, working in the rubber industry, Helicobacter pylori, atrophic gastritis are risk factors for gastric cancer (6,20). The increased use of smoked meat and barbecue in Jablanica district can be the reason for high incidence rates for gastric cancer.

The high misuse of tobacco and alcohol significantly contributed to the increased number of the diagnosed with laryngeal cancer. Laryngeal cancer in Jablanica district in male population (12.3) has a higher value of incidence rate in comparison to Central Serbia (11.6) (16), Serbia (8.9), Europe (6.7), world (4.1) (17). The mortality rate in Jablanica district (8.7) is higher than the values for Central Serbia (6.1) (16), Serbia (5.2), Europe (3.3), world (2.2) and all countries in the area (17). The morbidity and mortality among men in Jablanica district is not statistically significantly higher than the morbidity and mortality among men in Central Serbia. The most significant factor of risk for laryngeal cancer is the use of nicotine, alcohol, then the infection with human papilloma viruses, lower use of fruit and vegetables in combination with nicotine, infection H. pylori (7-9).

Cancer that is more common in men in the Jablanica district in comparison to men in Central Serbia is the oral cavity and pharyngeal cancer. This cancer shows the tendency of growth of the morbidity among men which is in Jablanica district statistically significant in comparison with the morbidity among men in Central Serbia. The incidence rate among men in Jablanica district (8.9) is higher than in Central Serbia (7.5) (16). Oral cavity and pharyngeal cancer does not have bigger influence on the total number of deaths caused by cancer in the residents in Central Serbia. The use of tobacco, alcohol, inadequate nutrition, infection by human papilloma viruses (HPV), immunosuppression, and oral lesions are known as factors of risk for oral cavity and pharyngeal cancer (10,11).

Around 30% of all cancers are caused by unhealthy life habits and inadequate nutrition. The most significant factors of risks for cancer that are the results of irregular way of life are: high body mass index, lower use of fruit and vegetables, insufficient physical activity, tobacco and alcohol. Transformation from normal into a malignant cell is a multilevel process which occurs due to interaction of genetic factors, outer agents (physical, chemical and biological cancerous matters) and aging.

The experts from WHO think that more than 30% of cancer can be prevented by changing or avoiding the key factors of risks which include: the use of tobacco, overweight and obesity, unhealthy nutrition with low use of fruit and vegetable, lack of physical activity, the use of alcohol, sexually transmitted (HPV) infections, urban air pollution, smoke from the households due to combustion of solid fuels. Preventive strategies include avoiding risk factors, vaccination against HPV and hepatitis B virus, control of professional risks, decreasing the exposure to the sun.

An early diagnostics is the imperative for the cancer treatment. Education of the population about early symptoms and signs of malignant diseases with the aim of an early detection and treatment, before the disease reaches the advanced stage has a special importance for those site specific cancers which do not undergo screening tests. For site specific cancers that require available screening tests, it is necessary to include as many residents as possible, especially those with multiple risk factors.

Conclusion

In the territory of the Jablanica district, the morbidity among men diagnosed with lung and bronchial cancer, colon and rectum cancer, bladder, oral cavity and pharyngeal cancer is higher as well as the total morbidity among newly diagnosed with all site specific cancers except for the skin, in comparison to the morbidity among newly diagnosed men in Central Serbia in the observed period. The mortality from lung and bronchial cancer among men in Jablanica district is higher than the number in Central Serbia.

As morbidity increased rate among the newly diagnosed patients in the observed period and further growth is expected, it is necessary to include highly risk groups and then as many people as possible. It is necessary to raise the level public consciousness about the importance of preventive examinations and to promote the healthy habits and tend to persuade as many people as possible to accept them and to incorporate them in their every day life.

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EPIDEMIOLOŠKE KARAKTERISTIKE MALIGNIH BOLESTI MUŠKE POPULACIJE U JABLANIČKOM OKRUGU I CENTRALNOJ SRBIJI

Goran Cvetanović, Marija Stojiljković, Mirjana Miljković, Nebojša Dimitrijević

Opšta bolnica Leskovac, Leskovac, Srbija

Povećanje starosti populacije i sve veća izloženost kancerogenima dovode do porasta oboljevanja od karcinoma širom sveta. S obzirom da se očekuje porast broja novoobolelih, potrebno je ukazati na najčešće lokalizacije malignih tumora kod stanovništva određenog područja i mere prevencije i ranog otkrivanja prevashodno usmeriti na te lokalizacije malignih tumora.

Cilj rada bio je praćenje kretanja oboljevanja i umiranja od karcinoma sa najvećom incidencijom među muškarcima u Jablaničkom okrugu u periodu od 1999. do 2009. godine i utvri da li postoje značajne razlike u broju novoobolelih i umrlih muškaraca sa teritorije Jablaničkog okruga u odnosu na broj novoobolelih i umrlih muškaraca u centralnoj Srbiji.

Kao izvori podataka korišćeni su podaci iz izveštaja "Incidencija i mortalitet od raka u centralnoj Srbiji" za 1999, 2004. i 2009. godinu Republičkog Instituta za javno zdravlje Srbije. Razlike u broju novoobolelih i umrlih muškaraca Jablaničkog okruga i centralne Srbije od karcinoma testirane su χ^2 testom.

Muškarci sa teritorije Jablaničkog okruga značajno češće oboljevaju od karcinoma pluća, karcinoma kolona i rektuma, mokraćne bešike, usne šupljine i farinksa. Takođe, ukupan broj novoobolelih muškaraca Jablaničkog okruga od svih lokalizacija karcinoma (bez kože) bio je veći u odnosu na broj novoobolelih muškaraca sa teritorije centralne Srbije. Broj umrlih muškaraca od karcinoma pluća sa teritorije Jablaničkog okruga je statistički značajno veći u odnosu na broj umrlih muškaraca sa teritorije centralne Srbije.

S obzirom da je u posmatranom periodu broj novoobolelih porastao i da se očekuje dalji rast, potrebno je sprovesti preventivne preglede i skrining programe, kojima u prvom redu treba obuhvatiti visoko rizične grupe, a zatim što veći broj ljudi. *Acta Medica Medianae 2015;54(1):40-47.*

Ključne reči: *karcinom pluća, karcinom kolona i rektuma, karcinom prostate, karcinom mokraćne bešike, karcinom želuca, karcinom larinksa, karcinom usne duplje*