

UDC 615.28:616-006:351.84

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STUDY OF SOCIO-EPIDEMIOLOGICAL INDICATORS OF MALIGNANT NEOPLASMS OF THE TRACHEA, BRONCHUS AND LUNG IN UKRAINE

The results of research on the socio-epidemiological morbidity and mortality of malignant neoplasm of trachea, bronchus and lung in Ukraine as a whole and in the regions have been presented in Ukraine. The study was conducted for the period of 2007-2012 years according to the National Cancer Registry of Ukraine. It has been established that morbidity and mortality of the nosology retains a tendency to decrease among men and increasing among women. The highest incidence observed in Kirovohrad, Mykolaiv, Zaporizhia regions, the lowest - in Volyn, Rivne, Zhytomyr, Ivano-Frankivsk and others. Results of the study is a scientific justification of the priorities of cancer struggle in Ukraine on the basis of dynamic and territorial characteristics of epidemiological development.

Key words: malignant neoplasm of trachea, bronchus and lung; morbidity and mortality.

FORMULATION OF THE PROBLEM

In recent years, malignant neoplasms (cancer) occupy a leading position in the overall structure of morbidity and mortality in Ukraine and around the world. Lung cancer in more than 20 countries occupy the first rank place in the structure of morbidity and mortality from cancer among the male population. Overall disease to cancer of the trachea, bronchus and lung have significant socio-economic consequences, determined the costs of providing medical and pharmaceutical care, and social support due to disability and premature death of patients.

ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

In most studies of local scientists question the cancer epidemiology is considered as a separate, independent line of research, the results of which determine the need to consider various problems of patients and medical support and base design further research [1; 4]. At the same time, recent studies of organizational and economic direction of the results of epidemiological studies are used to predict the compensation cost of medications by insurance companies with introduction of mandatory health insurance (MHI) [2].

RELEASE NO EARLIER SOLVED PART OF THE PROBLEM

As for today socio-epidemiological analysis of morbidity and mortality for malignant neoplasms of trachea, bronchus and lung in Ukraine as a whole and in the regions in order to calculate the necessary amount of pharmaceutical care have not conducted in Ukraine. Thus, taking into account the need to build effective models of public funding for medical and pharmaceutical providing of the patients with cancer of the trachea, bronchus according to spatial distribution of the country's aim of our study have been defined as follows.

FORMULATION OF PURPOSES OF THE ARTICLE

The aim of this work is the study of social and epidemiological data of morbidity and mortality from cancer of the trachea, bronchus and lung in Ukraine and further definition of administrative regions that require implementation of additional measures to improve the provision of medical and pharmaceutical care. The results of the analysis can be used to predict the amounts of reimbursement of medicines to patients with cancer of the trachea, bronchi and lungs.

PRESENTATION OF THE MAIN MATERIAL

Research was conducted on the basis of officially published data on morbidity and mortality in patients with cancer of the trachea, bronchus and lung by National Cancer Register of Ukraine [3]. According to the sections listed in the registry in the study was used the data from 2007-

2011 and operational information in 2012 that presented in frequency and age structure of the population. To analyze the incidence and mortality figures were taken in the absolute patient number and standardized rate per 100 thousand of the population. Statistical evaluation of indicators was held both for the entire population and separately for men and women.

In the studies we used a logical, mathematical, statistical, system-analytical, retrospective and comparative analysis methods. Preparation of statistical data for processing and analysis by years of research carried out by using tabular processor Microsoft Office Excell.

The analysis of the total number of cases of morbidity from cancer of the trachea, bronchus and lung in Ukraine for 2007-2012 years found that the number of cases in 2007 was 18316 people, including men – 15142 cases and women – 3174 and in 2012 – 16528 people, men – 13397 and women –

3131 respectively. Thus, the absolute increase (decrease) in the number of cases from 2007 to 2012 was held at – 1788 and relative – 9,76%. In comparing morbidity in terms of 100 thousand population for the period it was found that in 2007 the figure was 39,4 and in 2012 – 36,4. According to gender structure, the highest incidence among the male population had values 70,6 in 2007, the lowest – 63,9 in 2012. At the same time, the minimum value among the women 12,7 was observed in 2007, and the maximum – 13,6 in 2011. Absolute increase (decrease) in the incidence among men was held at 6,71, relative – 9,49 % and in the female population and 0,1 + 0,79%, respectively (table 1). It should be noted that although in 2007-2012 positive trend of the gradual reduction of cases and the incidence of cancer of the trachea, bronchus and lung occurs, but the problem remains acute and urgent.

The research of the National Cancer register among the 5 most common forms of lymphoma

Table 1

ANALYSIS OF THE CHANGES IN THE INCIDENCE OF DISEASE AND INDICATORS FOR CANCER OF THE TRACHEA, BRONCHUS AND LUNG FOR THE PERIOD OF 2007–2012 YEARS

| | Year | Number of cases | Incidence per 100 thousand population (crude rate) | Incidence per 100 thousand population (ukr. standard) | The annual growth rate | | | | | |
|-------|------------------|-----------------|--|---|-----------------------------------|------------|-----------------|------------|---------------|------------|
| | | | | | the number of registered patients | | rough indicator | | default value | |
| | | | | | abs. | relat. (%) | abs. | relat. (%) | abs. | relat. (%) |
| All | 2007 | 18316 | 39,4 | 37,6 | - | - | - | - | - | - |
| | 2008 | 17498 | 37,9 | 36,2 | -818 | -4,47 | -1,5 | -3,81 | -1,4 | -3,72 |
| | 2009 | 17372 | 37,8 | 35,99 | -126 | -0,72 | -0,1 | -0,26 | -0,21 | -0,58 |
| | 2010 | 17422 | 38,1 | 35,8 | -50 | 0,28 | -0,3 | 0,79 | -0,19 | -0,52 |
| | 2011 | 17418 | 38,2 | 35,7 | -4 | -0,02 | -0,1 | 0,26 | -0,1 | -0,28 |
| | 2012 | 16528 | 36,4 | * | -890 | -5,11 | -1,8 | -4,71 | * | * |
| | Growth 2007-2012 | abs. | -1788 | -3 | | | | | | |
| | relat.(%) | -9,76 | -7,61 | | | | | | | |
| Men | 2007 | 15142 | 70,6 | 81,2 | - | - | - | - | - | - |
| | 2008 | 14326 | 67,3 | 77,7 | -816 | -5,39 | -3,3 | -4,67 | -3,5 | -4,31 |
| | 2009 | 14232 | 67,18 | 77,08 | -94 | -0,66 | -0,12 | -0,18 | -0,62 | -0,80 |
| | 2010 | 14158 | 67,1 | 76,4 | -74 | -0,52 | -0,08 | -0,11 | -0,68 | -0,88 |
| | 2011 | 14075 | 66,9 | 75,9 | -83 | -0,59 | -1,01 | -1,51 | -0,50 | -0,65 |
| | 2012 | 13397 | 63,9 | * | -678 | -4,82 | -2,19 | -3,31 | * | * |
| | Growth 2007-2012 | abs. | -1745 | -6,71 | | | | | | |
| | relat.(%) | -11,52 | -9,49 | | | | | | | |
| Women | 2007 | 3174 | 12,7 | 10,3 | - | - | - | - | - | - |
| | 2008 | 3172 | 12,7 | 10,3 | 3 | 0,95 | 0 | 0 | 0 | 0 |
| | 2009 | 3140 | 12,67 | 10,27 | -32 | -1,01 | -0,03 | -0,24 | -0,03 | -0,29 |
| | 2010 | 3264 | 13,2 | 10,7 | 124 | 3,94 | 0,53 | 4,18 | 0,43 | 4,19 |
| | 2011 | 3343 | 13,6 | 10,9 | 79 | 2,42 | 0,4 | 3,03 | 0,2 | 1,87 |
| | 2012 | 3131 | 12,8 | * | -212 | -6,34 | -0,8 | -5,88 | * | * |
| | Growth 2007-2012 | abs. | -43 | 0,1 | | | | | | |
| | relat.(%) | -1,35 | 0,79 | | | | | | | |

Remark* — at the time of research data rate of conventional “crude indicator” and standardized indicator “Ukrainian standard” for 2012 were not available

cancer for 2007-2011 considering sex and age groups showed that the largest share in the structure of morbidity among males was at the age group 55-74 years – 21,8 % in 2007 and 19,5 % in 2011. The analysis by gender in the age groups shows that the highest incidence was among able-bodied male population.

It was further determined that the dynamics of the incidence of cancer of the trachea, bronchus and lung among the population was markedly different in some regions. According to the prevalence in 2012 it was found that in 14 of the 27 regions of Ukraine the incidence was higher (38,6-49,9 from 100 thousand of population) than the average for Ukraine (36,4 per 100 thousand of population). Leading positions in incidence rate have been observed in three regions – the leaders of 2012: Kirovohrad (49,9 per 100 thousand of population), Mykolaiv (48,5), Zaporizhia (47,6) regions, respectively, and the lowest – in Rivne (21,5), Volyn (21,7) and in Kyiv (25,2). It was established that the rate of incidence exceeds the maximum level of minimum almost 2,3 times.

The gender analysis by region showed that men had excess averages (63,9) in 15 regions (65,7 – 80,7) and women (12,8) – in 13 regions (13,9-19,9).

There have been grouping regions into three groups according to the average incidence rate for Ukraine in 2007-2012. Calculated step interval for the incidence rate was 8,43. The first group formed regions, which was characterized by fluctuations in the range 23,67-32,1 for 100 thousand population, the second - from 32,2 to 40,63; third – 40,64-49,07, and the average for Ukraine, this figure stood at 38,28. Taking into account the results of the grouping of regions for epidemiological incidence rates there were formed the group of risk: relatively low, moderate and threatening risks listed in the table 2. Summarize

the results of research it should be argued that most of the regions of Ukraine (11 regions or 40,74 % of the total) are in the group threatening disease risk for cancer of the trachea, bronchi and lungs. Nine regions (33,33 %) has been characterized by threatening risk, and seven regions (25,93 %) can be attributed to the moderate risk group.

At the next phase of the study, we have analyzed mortality, the results of which revealed that in the whole Ukraine total number of death cases from the above pathology was in 2007 – 14409 people, including men – 12257 cases and women – 2152 and in 2012 – 13582 people: men – 11294, women – 2288. The mortality rate in 2007-2012 years generally decreased on 6,09 %.

In the study of reproductive patterns among deceased people nosological forms (top-ten) was found that the largest proportion of male was observed in 2007 (25,5 %) and the lowest in 2011 (24,3 %) and in females there was a growth of 5,7 % (2007) to 5,9 % (2011), which on average + 0,2 %.

The structure of mortality among nosological forms (top five) in the aggregate deaths according to age group experienced the greatest percentage of men in the age group 55-74 years from 28 % to 26,8 % in 2007-2011, and women in the age group 75+ years where the maximum rate was noted in 2008 and amounted to 6,7%. The analysis by gender in the age groups shows a decline in mortality among men and a slight increase in women, although the number of men who die from cancer of the trachea, bronchus and lung significantly exceeds the number of women.

In order to determine the quality of medical and pharmaceutical care, we have analyzed the ratio of mortality / morbidity, which is an indirect indicator of the determination to provide quality medical and pharmaceutical care to patients with cancer [4]. It has been established that the ratio for

Table 2

RESULTS OF GROUPING THE REGIONS OF UKRAINE FOR CANCER OF THE TRACHEA, BRONCHUS AND LUNG IN 2007-2012 ACCORDING TO THE AVERAGE INCIDENCE PER 100 THOUSAND OF POPULATION

| Risk groups | Quantity of regions | % | Regions (incidence) |
|-----------------|---------------------|-------|--|
| Moderate risk | 7 | 25,93 | Vinnitsia (23,67) region, AR Crimea (25,29), Volyn (27,75), Dnipropetrovsk (29,1), Donetsk (30,09), Zakarpatskaya (30,79), Zaporizhia (30,15) region |
| Threatened risk | 9 | 33,33 | Zhytomyr (33,12), Ivano - Frankivsk (35,42), Luhansk (36,34), Kirovohrad (37,31), Kiev (37,39), Lviv (37,86), Mykolaiv (37,95), Chernihiv (40,06) region and city Kyiv (40,3) |
| High risk | 11 | 40,74 | Kharkiv (40,86), Odessa (41,06), Rivne (41,21), Poltava (42,32) region, city Sevastopol (42,56), Sumy (42,99), Ternopil (46,29), Kherson (46,89), Khmelnytsky (48,82), Cherkasy (48,68), Chernivtsi (48,98) region |

the period 2007-2011 was 78%, i.e. for every 100 reported cases cancer of the trachea, bronchus and lung recording an average 78 deaths in the whole of Ukraine, 81 men and 67 women, respectively. Threatening the indicator mortality / morbidity in 2007 was observed in three regional leaders – Luhansk (97,25 %), Sumy (89,87 %), Ivano – Frankivsk (89,31 %), and in 2011 in Poltava region (86,82 %), Sevastopol (86,55 %) and Luhansk region (86,4 5%) (table 3).

It should be noted that our calculated growth rate indicator mortality / morbidity were observed in 14 regions of Ukraine, where the relative increase was from 0,40 % to 14,79 %. In turn, the decrease took place in 13 regions of the country and had a value from – 21,03 % to – 0,11 %, and in the whole Ukraine – 0,52 %, respectively. That can be considered as a positive social and epidemiological trend.

The survey results show that the quality of medical and pharmaceutical care for cancer of the trachea, bronchus and lung needs improvement (according to clinical protocols) of measures for rational use of resources in health care, diagnosis and prevention at an early stage.

The analysis of morbidity and mortality based on gender structures and administrative regions, and the ratio of mortality / morbidity of administrative regions in future will be used to develop effective models of pharmaceutical care to patients with cancer of the trachea, bronchus and lung in the conditions of implementation of

medical insurance mechanism reimbursement of medicines.

CONCLUSIONS OF THE STUDY AND FURTHER RESEARCH IN THIS DIRECTION

1. It has been established that in 2007-2012 Ukraine has the positive trend of gradual reduction in the incidence of cancer of the trachea, bronchi and lungs. Thus, the absolute increase (decrease) in the number of cases during 2007 - 2012 was -1788 and relative -9.76%.

2. A significant dominance of the male population in the structure of the incidence of cancer of the trachea, bronchus and lung of male and female population for nosological forms (Top 10) has been observed. Thus, the percentage of male patients fluctuated between 19.4% (2007) to 17.5% (2011), of female growth rates were kept at 3.8%.

3. The highest incidence was observed in three leading regions in 2012 Kirovohrad (49.9 per 100 thousand population), Nicholayv (48.5), Zaporizhia (47.6) regions, respectively. For Rivne (21.5), Volyn (21.7) regions, Kyiv (25.2) is characterized by the lowest value.

4. The presence of a significant number of regions of Ukraine in the group threatening disease risk of cancer of the trachea, bronchus and lung determines necessitates of the efficiency of financial support and provision of medical and pharmaceutical aid for the realization of constitutional rights to get the effective medicines.

Table 3

THE ANALYSIS OF THE RATIO OF MORTALITY / MORBIDITY IN CANCER OF THE TRACHEA, BRONCHUS AND LUNG IN 2007 AND 2011

| Administrative territory | Ratio of mortality / morbidity (%) | | | Administrative territory | Ratio of mortality / morbidity (%) | | |
|--------------------------|------------------------------------|--------------|---------------------|--------------------------|------------------------------------|-------|---------------------|
| | 2007 | 2011 | relative decline, % | | 2007 | 2011 | relative increase % |
| Sumy | 89,87 | 70,97 | -21,03 | city Sevastopol | 75,4 | 86,55 | 14,79 |
| Ivano-Frankivsk | 89,31 | 75,57 | -15,38 | Volyn | 75,11 | 83,06 | 10,58 |
| Ternopil | 73,77 | 82,42 | -11,73 | Poltava | 79,95 | 86,82 | 8,59 |
| Luhansk | 97,35 | 86,45 | -11,2 | Chernihiv | 75,11 | 80,71 | 7,46 |
| Khmelnysky | 78,97 | 72,37 | -8,36 | Zaporizhia | 79,80 | 85,74 | 7,44 |
| Mykolaiv | 77,05 | 71,65 | -7,01 | Transcarpathian | 77,30 | 82,65 | 6,92 |
| Rivnenska | 81,57 | 76,28 | -6,49 | AR Crimea | 65,24 | 69,45 | 6,45 |
| Kyivska | 81,55 | 76,75 | -5,89 | Lviv | 75,81 | 78,79 | 3,93 |
| city Kyiv | 78,91 | 74,45 | -5,62 | Chernivtsi | 81,22 | 84,10 | 3,55 |
| Vinnysia | 86,38 | 82,84 | -4,10 | Kharkiv | 67,97 | 70,37 | 3,53 |
| Zhytomyr | 85,38 | 83,10 | -2,79 | Donetsk | 76,72 | 79,38 | 3,47 |
| Dnipropetrovsk | 79,18 | 78,29 | -1,12 | Cherkasy | 77,07 | 78,96 | 2,45 |
| Ukraine | 78,68 | 78,27 | -0,52 | Kherson | 83,26 | 83,59 | 0,40 |
| Odessa | 73,94 | 73,86 | -0,11 | Kirovohrad | 74,54 | 75,27 | 0,98 |

5. Analysis of mortality from cancer of the trachea, bronchus and lung showed the impact of this disease on the structure of mortality in Ukraine. The death rate from this disease is gradually reduced, but only slightly so, the mortality rate for 2007–2012 generally decreased for 6.09%.

6. Analysis of the ratio of mortality / morbidity in cancer of the trachea, bronchus and lung in the general population of Ukraine and by regions indicates the need to identify the causes of high mortality diseases for appropriate organizational solutions in the provision of quality medical and pharmaceutical care.

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УДК 615.28:616-006:351.84

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ДОСЛІДЖЕННЯ СОЦІАЛЬНО-ЕПІДЕМІОЛОГІЧНИХ ПОКАЗНИКІВ ЗАХВОРЮВАНOSTІ ТА СМЕРТНОСТІ НА ЗЛОЯКІСНІ НОВОУТВОРЕННЯ ТРАХЕЇ, БРОНХІВ ТА ЛЕГЕНІВ В УКРАЇНІ

Представлені результати дослідження соціально-епідеміологічних показників захворюваності та смертності на злоякісні новоутворення трахеї, бронхів, легенів у цілому по Україні та в регіонах. Дослідження проведено за період 2007-2012 рр. за даними Національного канцер-реєстру України. Встановлено, що захворюваність та смертність даної нозології зберігає тенденцію до поступового зменшення у чоловіків та збільшення у жінок. Найвищі рівні захворюваності спостерігались в Кіровоградській, Миколаївській Запорізькій областях, найнижчі – у Волинській, Рівненській, Житомирській, Івано-Франківській та ін. Результати дослідження є науковим обґрунтуванням пріоритетів організації протиракової боротьби в Україні з урахуванням динамічних та територіальних особливостей розвитку епідеміологічного процесу.

Ключові слова: злоякісні новоутворення трахеї, бронхів та легенів; захворюваність, смертність.

УДК 615.28:616-006:351.84

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ИССЛЕДОВАНИЕ СОЦИАЛЬНО-ЭПИДЕМИОЛОГИЧЕСКИХ ПОКАЗАТЕЛЕЙ**ЗЛОКАЧЕСТВЕННЫМИ НОВООБРАЗОВАНИЯМИ ТРАХЕИ, БРОНХОВ И ЛЕГКИХ В УКРАИНЕ**

Представлены результаты исследования социально-эпидемиологических показателей заболеваемости, смертности и смертность/заболеваемость злокачественными новообразованиями трахеи, бронхов и легких в целом по Украине и регионам. Исследование проведено за период 2007-2012 гг. на основании бюллетеня Национальный канцер-реестр Украины. Установлено, что заболеваемость и смертность от злокачественных новообразований трахеи, бронхов и легких населения Украины сохраняет тенденцию постепенного уменьшения у мужчин, и увеличения у женщин. Высокие уровни заболеваемости наблюдались у тройки регионов-лидеров Кировоградской, Николаевской и Запорожской областях, низкие – в Волынской, Ровенской, Житомирской, Ивано-Франковской, Черновицкой областях и г. Киев. Результаты исследования послужат научным обоснованием приоритетов организации противораковой борьбы в Украине с учетом динамических и территориальных особенностей развития эпидемиологического процесса.

Ключевые слова: злокачественные новообразования трахеи, бронхов и легких, заболеваемость, смертность.

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Надійшла до редакції:

07.07.2014