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# CHARACTERISTICS OF THE VOLUME AND OUTCOMES OF MEDICAL CARE FOR PATIENTS WITH SKIN CANCER IN UKRAINE IN 2010-2020

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## ABSTRACT

**The aim:** To investigate the dynamics of the volumes and outcomes of medical care for patients with skin cancer in Ukraine during 2010-2020.

**Materials and methods:** Official statistical data from the reports of the Center for Medical Statistics of the Center for public health of the Ministry of Health of Ukraine and the National Cancer Registry for 2010–2020. Statistical and bibliosemantic methods were used in the work.

**Results:** A decrease in the capacity to provide medical care to patients with skin cancer was identified, as evidenced by a decrease in the number of oncological dispensaries, oncological and examination rooms in outpatient clinics, oncological and radiological beds, with a relatively unchanged level of staffing. An analysis of the main indicators of the organization and activities of medical care for patients with cancer skin revealed problems with early detection of tumors, in particular during preventive examinations, and incomplete coverage of patients with stages I-II of the disease with special treatment.

The positive dynamics of melanoma treatment outcome indicators were revealed (increase in accumulation index, 5-year patient survival rate, decrease in lethality and mortality).

**Conclusions:** the organization of medical care for patients with skin tumors, especially non-melanoma ones, needs further improvement in the context of preventive interventions, ensuring the coverage of patients with special treatment.

**KEY WORDS:** skin cancer, organization of medical care, availability of doctors, hospital beds, timeliness of detection, completeness of treatment coverage

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## INTRODUCTION

The problem of skin cancer remains relevant both in Ukraine and throughout the world. Among numerous skin diseases, neoplasms, which are classified as malignant and benign, occupy a prominent place. According to the World Cancer Research Fund [1] on the prevalence of cancer in the world in 2020, skin melanoma ranked 17th (13th in men and 15th in women). The age-standardized melanoma incidence rate was 3.4 cases per 100,000 population; the mortality rate was 0.6 cases per 100,000 population (for other, so-called “non-melanoma”, skin neoplasms – 11.0 and 0.6, respectively).

In the structure of primary cancer morbidity in Ukraine, non-melanoma malignancies of the skin rank third (9.9%) in men and second (12.9%) in women [2].

## THE AIM

To investigate the dynamics of the volumes and outcomes of medical care for patients with skin cancer in Ukraine during 2010-2020.

## MATERIALS AND METHODS

In the course of the work, it was used official statistical data from the reports of the Center for Medical Statistics of the Center for public health of the Ministry of Health of Ukraine “Incidence rates of malignant neoplasms and activities of the oncology service in Ukraine”, the National Cancer Registry (Bulletin “Cancer in Ukraine”, Vol. 23) for 2010–2020. Statistical and bibliosemantic methods were used in the work.

## RESULTS

An analysis of the organization of medical care is impossible without a preliminary assessment of the capacity to provide it. Currently, Ukraine has a network of institutions providing qualified specialized medical care to patients with skin cancer, which is mainly represented by oncological dispensaries. In 2020, there were 27 of them (in 2010, there were 41), meaning that their number decreased by 34.1% in 10 years. None of them has a specialized department for the treatment of skin cancer patients. Most of these patients are treated on

**Table I.** Dynamics of provision of the population of Ukraine with oncologists and oncological surgeons in Ukraine in 2010, 2020

Indicator	2010	2020
Oncologists (Abs)	843	714
Oncologists (per 10,000)	0.18	0.17
Surgical Oncologist (Abs)	777	676
Surgical Oncologist (per 10,000)	0.17	0.16

**Table II.** Dynamics of the bed capacity of the Oncology Service in Ukraine in 2010, 2020

Indicator	2010	2020
Oncology beds for adults (Abs)	9557	7680
Oncology beds for adults (per 10,000)	2.09	1.85
Radiology beds (Abs)	2674	1995
Radiology beds (per 10,000)	0.58	0.48

**Table III.** Dynamics of indicators of oncology and radiology bed usage in Ukraine in 2010, 2020

Indicator	Oncology beds		Radiological beds	
	2010	2020	2010	2020
Average annual occupation of the bed	342.5	253.9	378.4	308.9
Average length of stay in a hospital	12.5	6.8	21.9	21.1
Bed turnover	27.4	37.2	17.2	14.7

an outpatient basis, as in most cases they do not require long-term hospitalization.

Medical care is also provided by specialists in oncology and examination rooms of outpatient facilities. Over the past 10 years, the number of oncology rooms has decreased by 34.9%, and the number of examination rooms has almost tripled.

Medical care for patients with skin cancer is provided by oncologists and surgical oncologists, the availability of which is shown in Table I.

Over the past decade, the supply of oncologists and surgical oncologists has decreased by 5.5%, but there are significant regional differences. In particular, the number of oncologists per 10,000 inhabitants ranges from 0.06 in the Dnipropetrovsk region to 0.31 in the Chernivtsi region, and the number of surgical oncologists per 10,000 inhabitants ranges from 0.05 in the Zakarpattia to 0.28 in Ternopil region.

It should be noted that the group of "oncologists" in the list of medical specialties in Ukraine includes surgical oncologists, gynecologic oncologists, oncologists-otolaryngologists, but there is no specialty of oncologists-dermatologists despite the high prevalence of skin cancer.

The parallel decrease in the supply of dermato-venereologists over the past 10 years by 37.8% to 0.46 per 10,000 population in 2020 may be justified and is associated with a decrease in morbidity, primarily venereal diseases. However, such a decrease is an unfavorable factor, since it is to these specialists, as a rule, that the family doctor refers patients with skin diseases. The frequency of detection of malignant skin tumors among patients who have consulted a dermatologist is 2% [3].

It is the oncological alertness of the dermato-venereologist and the quality of the initial professional examination of the patients that subsequently have a significant impact on the timeliness of diagnosis and the effectiveness of treatment of patients with skin cancer by the oncologist.

In the last five years, the professional qualification of doctors providing medical care to patients with skin cancer has improved. Thus, the proportion of doctors with a higher category has increased: among oncologists - up to 55% and among oncological surgeons - up to 75%, which may in part be due to the aging of medical personnel in the health system as a whole. Data on the bed capacity of the oncology service and the availability of oncology and radiology beds for medical care, including for patients with skin cancer, are presented in Table II.

The overall decrease in the number of beds in the country was also reflected in the number of oncology beds, which decreased by 19.6% over 10 years, and the availability of beds - by 11.4%. The provision of the population with oncology beds is characterized by certain regional features: it was the highest in the Chernihiv and Poltava regions (2.9 and 2.8 beds per 10,000 population, respectively); the lowest - in the Ivano-Frankivsk and the Rivne regions (1.3 and 1.4 beds per 10,000 inhabitants, respectively).

It is known that radiation therapy is one of the most common methods of cancer treatment. Therefore, consideration should be given to the availability of this type of treatment for the population. Over the past decade, not only the absolute number of beds has decreased (by 25.3%), but also the provision with them (by 17.2%).

At the same time, it should be noted that the demand for appropriate treatment is significant. This is evidenced by the overload of radiology beds, and hence their deficiency. The average annual occupation of radiology beds in 2020 in Zhytomyr, Chernihiv regions and the city of Kyiv was 553.7; 433.1 and 501.8, respectively. The availability of radiology beds for the population also has some regional differences - from 1.0 per 10,000 people in the Sumy region to 0.3 in Odesa region.

The dynamic of availability of beds for the treatment of cancer patients per 1,000 patients turned out to be

**Table IV.** The main indicators of the state of oncological care for patients with malignant neoplasms of the skin in Ukraine in 2010, 2020

Indicator	Skin melanoma		Other skin neoplasms		All neoplasms	
	2010	2020	2010	2020	2010	2020
Morphologically confirmed diagnosis (per 100 new patients )	98.5	98.3	97.6	97.1	81.4	83.5
Percentage of patients detected during preventive examinations (%)	42.8	43.6	64.9	54.9	27.8	21.1
The specific weight of patients detected in the stages among patients with a newly established diagnosis (%):						
I - II	68.6	79.3	91.1	90.8	51.0	46.6
III	17.1	5.0	1.0	1.6	19.1	17.7
IV	4.3	5.1	0.1	0.3	14.9	19.9
the stage is not established	9.9	10.6	7.7	7.3	15.1	15.8
Specific weight of patients who received special treatment to the number of patients registered in the reporting year (%)	89.8	90.2	87.4	85.3	66.8	67.9

**Table V.** Some indicators of treatment outcomes for patients with melanoma and other skin tumors in Ukraine in 2010, 2020

Indicator	Skin melanoma		Others neoplasm skin		All neoplasms	
	2010	2020	2010	2020	2010	2020
Accumulation index (prevalence ratio to primary morbidity)	8.5	13.6	0.3	0.2	6.8	11.1
The specific weight of patients who were under dispensary supervision for 5 years or more among all such patients (%)	60.9	68.8	59.9	63.7	58.8	64.3
Mortality rate up to a year (per 100 newly registered in the previous year)	13.9	7.3	0.7	0.7	30.0	24.2
Mortality rate (per 100 patients )	0.3	0.2	5.5	3.0	8.7	5.3
Mortality (per 100,000 people )	2.4	2.1	1,2	1,2	178.5	138.4

positive: in 2020, it was 91.0 (from 130.7 in the Chernivtsi region to 53.1 in Kyiv region) and increased by 10.7% over the previous 10 years.

The analysis of the dynamics of indicators of oncology and radiology bed usage (Table III) shows its diversity. Thus, the average number of days occupied by oncology beds decreased by 25.8%, which is not so much due to the lack of specialized patients as to the reorganization of inpatient care during the Covid-19 pandemic. The average length of stay of a patient on an oncology bed was almost halved, which accelerated the bed turnover to 37.2 patients (an increase of 35.7%) and improved the opportunities for oncology patients to receive inpatient care.

The situation with the use of radiology beds is different: although the average number of days of their employment has decreased by 18.4%, it continues to be too high in some areas, as was mentioned above. At the same time, treatment duration remains stable, as radiotherapy requires adherence to a clinical protocol, and bed turnover decreased by 14.5%.

A number of indicators of the state of oncological care (relating to diagnosis and treatment) were analyzed for patients with skin cancer in comparison with all patients with malignancies (Table IV). Based on all the

indicators above, it is evident that the situation with the diagnosis and treatment of patients with skin cancer is better in comparison with all neoplasm locations: a greater specific weight of skin neoplasms is morphologically confirmed, revealed during professional examinations, including at stage I-II, and, with the rest, a greater percentage of patients (about 85-90%) will receive special treatment immediately after diagnosis. However, 10-15% of untreated patients demonstrate the inability of medical facilities to provide specialized medical care [4].

Comparing the situation according to the above indicators between the diagnosis and treatment of melanoma and other skin neoplasms is better in favor of the latter, although the ten-year dynamics of these indicators is positive for melanoma. Thus, the share of melanoma cases diagnosed at stage I-II increased by 15.6%. At the same time, the specific weight of patients with other skin neoplasms, as a whole, detected during professional examinations decreased by 15.4%. The latest developments in diagnostic imaging techniques have been an advancement in the management of patients, especially those with melanoma, as they allow the detection of distant metastases in asymptomatic melanoma.

Attention is drawn to the unfavorable situation in some regions of Ukraine according to certain indicators. For example, in the Chernivtsi region, only 5% of melanomas are detected during medical examinations, in the Volyn region, only 2%, but 89% are in stage I-II. The situation is similar in the Kherson region with regard to non-melanoma skin tumors (the indicators are 8.6% and 92.5%, respectively). The level of neglect of malignancies of the so-called "visual localization" (which includes skin tumors) is evidenced not only by their late detection in stages III-IV, but also by the specific weight of cases of diseases whose stage remained undetermined, especially in relation to melanoma: in the Kharkiv region such were 40%, in Chernivtsi - 35%, in Rivne - 29%. The conducted studies showed [2] that the annual mortality of patients in this group is close to the annual mortality of patients with malignancies of neglected stages.

An important characteristic of the organization of medical care is its effectiveness, which largely depends on the quality of treatment. Performance indicators can be considered the index of accumulation (the ratio of the prevalence to incidence); the specific weight of patients who were under dispensary supervision for 5 years or more among all such patients; lethality rate up to one year (per 100 newly registered in the previous year); total lethality (per 100 patients and mortality (per 100,000 population) [5], the values of which demonstrate positive dynamics in relation to all neoplasms (Table V).

According to the index of accumulation, the increase of which indirectly indicates an improvement in the level of medical care for the population, there is a positive trend in relation to melanoma (by 60%). The proportion of patients with melanoma and other skin neoplasms who were under dispensary observation for 5 years or more also increased.

Such patients are usually considered cured because their mortality rate is close to that of the general population [2]. Mortality from melanoma is gradually reaching a stable level, which is associated with the emergence of new effective methods of treatment.

Annual lethality of melanoma patients decreased by almost half, total lethality by a third, mortality by 12.5% (compared to all cancer patients by 19.3%, 39.3%, and 22.4%, respectively). In patients with other skin neoplasms, a positive trend was observed only in terms of mortality, but its decrease was the most noticeable - by 45.5%. Annual lethality of melanoma patients decreased by almost half, total lethality by a third, and mortality by 12.5% (compared to all cancer patients by 19.3%, 39.3%, and 22.4%, respectively).

Thus, the problem of improving the organization of medical care for patients with skin cancer remains rel-

evant [6] and requires an increase in the level of early detection, as well as the creation of a comprehensive program for the diagnosis, treatment and prevention of this group of malignant neoplasms and the development of educational programs for the country's population. Patients with skin tumors are cared for by doctors of several specialties, and close cooperation between family doctors, dermatologists, and oncologists will be important to ensure early diagnosis, adequate treatment, comprehensive support, and competent monitoring of patients [7].

## DISCUSSION

An analysis of the state of medical care for patients with skin cancer in Ukraine has shown certain negative trends, and, consequently, the imperfection of the existing system for diagnosing and treating skin cancer. However, the main goal of optimal treatment is not only to reduce mortality, which, in particular, was used to evaluate the effectiveness of treatment, but also to ensure a better quality of life and long-term treatment of relapses and side effects [8]. According to the survey, patients found that they are worried about the occurrence of recurrence and a cosmetic defect. Patients also consider communication with the attending physician to be an important point, they seek to receive detailed information about their disease and actively participate in decision-making on diagnostics and treatment [9].

The provision of medical care to patients with skin cancer is a complex step-by-step process that involves several specialists, often without communication among themselves regarding an individual patient. There is also an obvious need for continuous treatment, the positive results of which are improved adherence to medical regimens, reduced likelihood of hospitalization and financial costs [10].

Thanks to the introduction of the latest technologies in the treatment of skin cancer, the survival rate of patients is increasing. But until now, the weak link in medical care for patients with skin cancer is its early diagnosis. Timely detection of suspicious skin changes using imaging techniques can help in the early diagnosis of skin cancer, increasing the likelihood of a favorable treatment outcome [11]. A progressive step forward could be the use of telemedicine, especially for patients who have barriers to traditional in-person doctor visits (who live outside major cities or have limited functionality) [12].

It should be noted that the state of medical care for patients with skin cancer is not well understood. The vast majority of publications both in Ukraine and abroad are devoted to the specifics of the diagnosis



and treatment of skin cancer. The conducted research should become the basis for the improvement this area of medical care. In order to fully characterize the state of medical care for patients with skin cancer, it is necessary to assess the factors affecting its organization by interviewing doctors involved in providing care to patients with skin cancer (oncologists, surgical oncologists, dermatologists, family doctors).

In order to fully characterize the state of medical care for patients with skin cancer, it is necessary to assess the factors affecting its organization by interviewing doctors involved in helping patients with skin cancer (oncologists, surgical oncologists, dermatologists, family doctors).

The opinion of patients regarding their satisfaction with the care received is also important. A separate study needs to be done on the prevention of skin cancer.

## CONCLUSIONS

The possibilities of providing medical care to patients with skin cancer have decreased: the number of oncological dispensaries, oncological and examination rooms in outpatient facilities, oncological and radiological beds has decreased, while the level of staffing has remained relatively unchanged.

The analysis of the main indicators of oncological care for patients with malignant skin neoplasms revealed problems with the early detection of tumors, in particular during preventive examinations, and incomplete coverage of patients with the I-II stage of the disease with special treatment.

The positive dynamics of melanoma outcome indicators have been established (increase in accumulation index, five-year patient survival, decrease in lethality and mortality). The organization of medical care for patients with skin tumors, especially non-melanoma ones, needs further improvement.

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### Conflict of interest:

*The Author declare no conflict of interest.*

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