

EPIDEMIOLOGY OF BASAL CELL CARCINOMA – OBSERVATIONS OF ONE DEPARTMENT

Agneszka Borzęcka-Sapko¹⁾, Piotr Siermontowski²⁾, Mateusz Mleczko³⁾, Andrzej Borzęcki⁴⁾

¹⁾ Med-Laser Non-public Health Care Unit Dermatological Department, Lublin, Poland

²⁾ Department of Underwater Works Technology, Naval Academy, Gdynia, Poland

³⁾ Independent Public Regional Specialist Hospital in Chełm, Dermatological Department, Chełm, Poland

⁴⁾ Chair and Department of Hygiene, Department of Health Sciences, Medical University of Lublin, Poland

STRESZCZENIE

Introduction. Basal cell carcinoma is the most common malignant skin cancer. It is one of the so-called nonmelanoma skin cancers, the incidence of which has increased rapidly worldwide in recent years. Unfortunately, the National Cancer Registry in Poland does not classify basal cell skin cancer separately. Therefore, the precise data on the incidence in the population remain unknown.

Work objective. Retrospective analysis of the incidence of basal cell carcinoma in NZOZ Med-Laser in Lublin in the years 2005 – 2015 depending on gender, age group, place of residence (urban-rural) and clinical form of the disease.

Material and methodology. The data of NZOZ Med-Laser from the years 2005 - 2015 were used in the study. The data concern all patients with histopathologically diagnosed basal cell carcinoma, who during the period covered by the study were consulted either as outpatients or hospitalised in an institution providing dermatological services under contract with the National Health Fund (NFZ). Patients were divided into several groups depending on gender, age and place of residence. All groups were compared quantitatively and the results are shown in the figures below.

Results. The data collected indicate that between 2005 and 2015 a total of 922 patients with basal cell carcinoma received dermatological treatment. Over the years, there has been a clear increase in the number of patients with basal cell carcinoma. The disease occurred mainly in people over 59 years of age, with the majority of women living in cities. The most common locations of the cancer are nose, cheeks, forehead and temporal area. Histopathologically, solidum, superficiale, exulceratum and pseudoadenoides were the most frequently diagnosed forms.

Conclusions. Basal cell carcinoma of the skin is frequent in our society. Its incidence has been increasing in recent years. Therefore, action should be taken to create consistent international registries to gather reliable epidemiological data that would show the scale of the problem, which we are dealing with almost all over the world.

Keywords: basal cell carcinoma of the skin; epidemiology; nonmelanoma skin cancer.

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INTRODUCTION

Skin caners are the most common human malignancies [1]. Among them are nonmelanoma skin cancers and melanomas.

Nonmelanoma skin cancers can be divided into basal cell carcinomas (carcinoma basocellulare, basalioma, basal cell carcinoma BCC - the most common and accounting for 70-80% of cases), squamous cell carcinomas (SCC, carcinoma spinocellulare) - accounting for about 20% of cases, and mixed (carcinoma basosquamosum, carcinoma metatypicum) - about 2% of cases [2]. It follows that basal cell carcinoma is the most common skin cancer in humans [3]. Despite the high prevalence, good quality epidemiological data are poor.

Basal cell carcinoma (BCC) is a slow growing, typically malignant epithelial skin cancer. Its development is influenced by both genetic and environmental factors. It mainly affects people over-exposed to ultraviolet radiation [4].

EPIDEMIOLOGY OF BASAL CELL CARCINOMA IN THE WORLD

Basal cell carcinoma occurs almost everywhere in the world. Despite numerous reports and publications,

data on the epidemiology of basal cell carcinoma is still incomplete, due to the use of a common registry for nonmelanoma skin cancers in the largest databases in the world (Globocan, Nordcan, ECO, WHO, SEER, Cancer Research UK and the German Centre for Cancer Registry Data).

On the basis of the available data, the incidence of BCC has been steadily increasing over the last 50 years, with a 3-10% annual increase [5]. The prevalence depends on ethnicity, latitude and age.

More cases have been found among Caucasians, where it is the most common malignant tumour compared to the black and Asian ethnicities [6]. The lifetime risk of developing this cancer among Western European white people born in 1994 was 33% [7,8].

The prevalence of basal cell carcinoma in North America and Europe is comparable - probably because the majority of North American residents are of European origin. The highest incidence is among Scandinavian immigrants in Australia, where the incidence is 20 times higher compared to England. Statistical information for the same geographical area often differs depending on the publication (Table 1).

Tab. 1

Epidemiological diversification of BCC in the world.

Geographical region	Incidence rate in women	Incidence rate in men
Europe (9, 10, 11)		
Germany	95 / 100 000	96 / 100 000
Finland	45 / 100 000	49 / 100 000
Switzerland	38 / 100 000	52 / 100 000
Netherlands	38 / 100 000	53 / 100 000
North America (12, 13)		
USA	146 / 100 000	
South America (14, 15)		
Canada	68 / 100 000	87 / 100 000
Brasil	61 / 100 000	56 / 100 000
Australia and Oceania (16)		
Australia	250 - 726 / 100 000	

Moreover, the incidence rate increases with age, with a peak in the 6th to 8th decade. Occasionally, it occurs in young people and may then suggest hereditary developmental disorders, particularly nevoid basal cell carcinoma syndrome.

EPIDEMIOLOGY OF BASAL CELL CARCINOMA IN POLAND

Epidemiological data on basal cell skin cancer are not collected in Poland, which makes the incidence rate difficult to estimate. The maps of health needs for 2016 published by the Ministry of Health show epidemiological data on the group of diagnoses called nonmelanoma

malignant skin cancers, precancerous conditions and in situ cancers. However, it should be remembered that the data refer only to the services provided in accordance with the National Health Fund (NFZ). According to the report, the prevalence rate recorded as at 31.12.2016 for data collected since 2009 is 273.5 thousand, while the recorded prevalence rate is 700/100 thousand people. The registered incidence rate for this type of disease units is 39 thousand, while the registered incidence rate is 101.5/100 thousand of population. Taking into account that 80% of non-melanoma skin cancers are BCC, it is easy to obtain epidemiological estimates of this type of cancer [17].

According to the National Cancer Registry, more

than 2700 new skin cancers were reported in 2000 among women and more than 2600 among men, while in 2010, 5300 and 4800 new cases were reported respectively [18].

Tab. 2

Epidemiology of nonmelanoma skin cancers in Poland.

Year	Incidence rate in women	Incidence rate in men
2000	71 / 100 000	68 / 100 000
2010	139 / 100 000	126 / 100 000

TYPES OF BASAL CELL SKIN CANCER

Many varieties of basal cell carcinoma are known, depending on histological and clinical characteristics. Since these tumours are common, all varieties should be included in the diagnostic differentiation to avoid overlooking basal cell carcinoma. The most common types of basal cell carcinoma are: early basal cell carcinoma, basal cell carcinoma nodosum (BCC nodosum), basal cell carcinoma cysticum (BCC cysticum), basal cell carcinoma exulcerans, basal cell carcinoma pigmentosum (BCC pigmentosum), sclerosin basal cell carcinoma, keloid basal cell carcinoma, superficial multiple epitheliomas, polypoid basal cell carcinoma, fibroepithelioma, metatypoid basal cell carcinoma, scarring basal cell carcinoma, metastatic basal cell carcinoma. BCC seldom, if at all, gives metastases [19].

RESEARCH OBJECTIVE

The aim of the study was to analyse the prevalence of basal cell carcinoma among patients treated in NZOZ Med-Laser in Lublin in 2005-2015, taking into account gender, age, place of residence and the clinical form of the disease.

MATERIAL AND METHOD

The study used demographic data of NZOZ Med-Laser from 2005-2015. The basis for verification of patients with basal cell carcinoma diagnosis (ICD C44) was a personal identification number in the Universal Electronic System of Population Records (PESEL). The data

concerns all patients with a histopathological diagnosis of basal cell carcinoma who were consulted as outpatients or hospitalised in an institution providing services under contract with the National Health Fund (NFZ) during the period covered by the study. However, patients who were consulted during private admissions were not included. The identification number of one basal cell carcinoma patient was included in the statistical analysis only once. Patients were divided into several groups by gender, age and place of residence. Six age groups were distinguished for both genders: young patients aged 20-29 (first group), 30-39 (second group), 40-49 (third group), 50-59 (fourth group) and patients over 59 (fifth group). The analysis took into account the age of the patient on admission, which is not the same as the age of disease occurrence. All groups were compared quantitatively and the results are shown in the figures below.

RESULTS

The survey was conducted on the basis of statistical data collected for 11 years. Between 2005-2015 NZOZ Med-Laser delivered 1165 consultations on skin cancers. According to the histopathological result 49 cases were diagnosed as melanoma, while the remaining 1116 cases were nonmelanoma skin cancers (Fig. 1). Of the non-melanoma skin cancers diagnosed histopathologically, 8 out of 10 cases are BCC, which corresponds to American data. This means that between 2005 and 2015 a total of 922 patients with basal cell skin cancer were provided with medical consultations (Fig. 2).

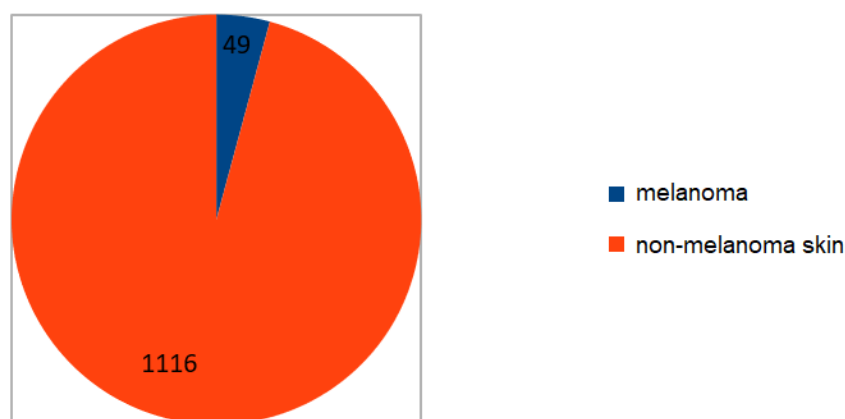


Fig. 1 Percentage of non-melanoma skin cancers among all skin cancers requiring medical consultation.

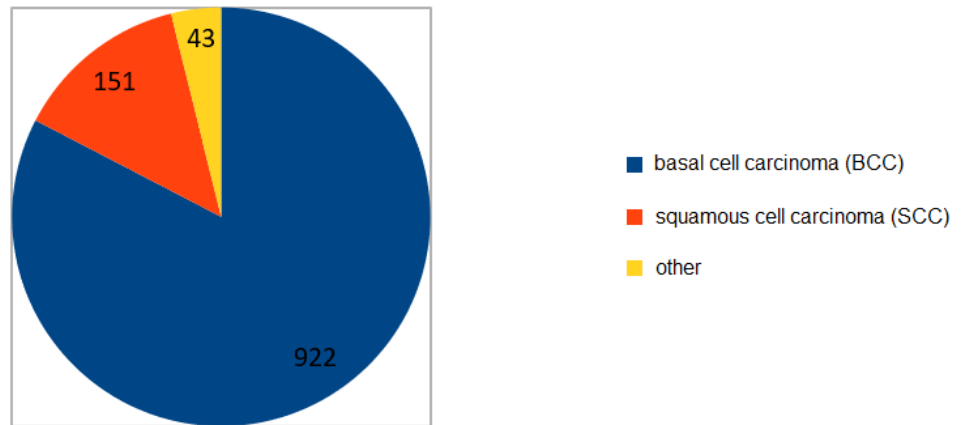


Fig. 2 Percentage share of BCC among all non-melanoma skin cancers requiring medical consultation.

The number of BCC patients diagnosed and requiring outpatient treatment has increased in recent years. In 2005, 28 new cases were diagnosed (3.04%), while in 2015, 147 new cases (15.94%) were reported (Figure 3).

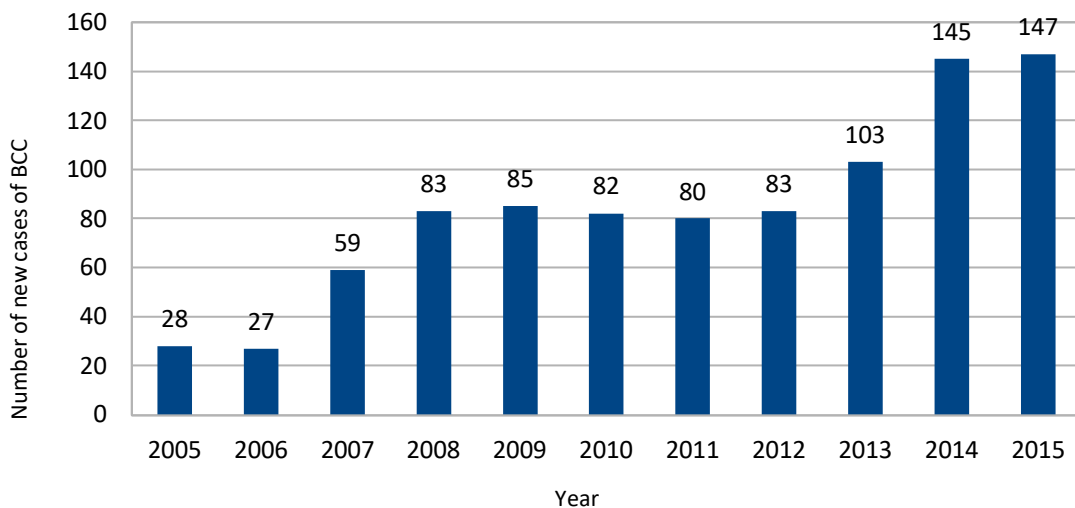


Fig. 3 The number of new cases of BCC in years 2005-2015 in NZOZ Med-Laser.

Among the patients who received medical services, women prevailed. They constituted 56.94% (525) and men 43.06% (397). The ratio of women to men was 1:0.76. It differed significantly from one year to another.

Based on the statistical data, it was found that the medical services were used more often by city dwellers than by residents of rural areas. Urban residents accounted for 78.08% (720) and rural residents for 21.91% (202) of patients. However, during the years of observation, the highest increase in the frequency of patients can be observed to have come from smaller towns, especially rural areas.

Women living in urban areas accounted for 75.81% (398) and those living in rural areas for only 24.19% (127) of women referred to medical facilities. An even greater disparity was noted for men. As many as 81.13% (322) of all men with BCC who benefited from medical services lived in cities and only 18.87% (75) in rural areas. Over the years, an increase in the frequency of BCC consultations among people from smaller towns, especially rural areas, was observed in both women and men (Table 3).

Number of new BCC cases by gender and place of residence.

Year	Gender/place of residence								Total
	Women				Men				
	Large city	Medium-sized city	Small town	Village	Large city	Medium-sized city	Small town	Village	
2005	0	12	6	2	0	5	1	2	28
2006	0	7	4	3	0	7	5	1	27
2007	0	14	5	10	0	13	11	6	59
2008	1	15	13	15	0	18	11	10	83
2009	3	15	13	15	0	18	12	10	85
2010	0	19	10	15	0	23	10	5	82
2011	0	20	7	7	0	35	8	3	80
2012	0	26	16	11	0	15	10	5	83
2013	0	38	19	10	1	15	15	5	103
2014	49	11	10	18	21	14	5	14	145
2015	1	43	23	22	0	26	21	11	147
Total	54	220	126	128	22	189	109	74	922
	5.88%	23.88%	13.61%	13.84%	2.42%	20.53%	11.76%	8.07%	100%

Persons up to 20 years of age constituted 0% of patients, 20-29 years of age - 0.33%, 30-39 years of age - 1.85%, 40-49 years of age - 3.58%, 50-59 years of age - 10.31%, and over 59 years of age - 83.93%. It should be noted that over the years a decrease in the age of BCC

incidence was noted. The higher frequency of diagnoses in 2015 compared to 2005 is statistically significant (Figure 4).

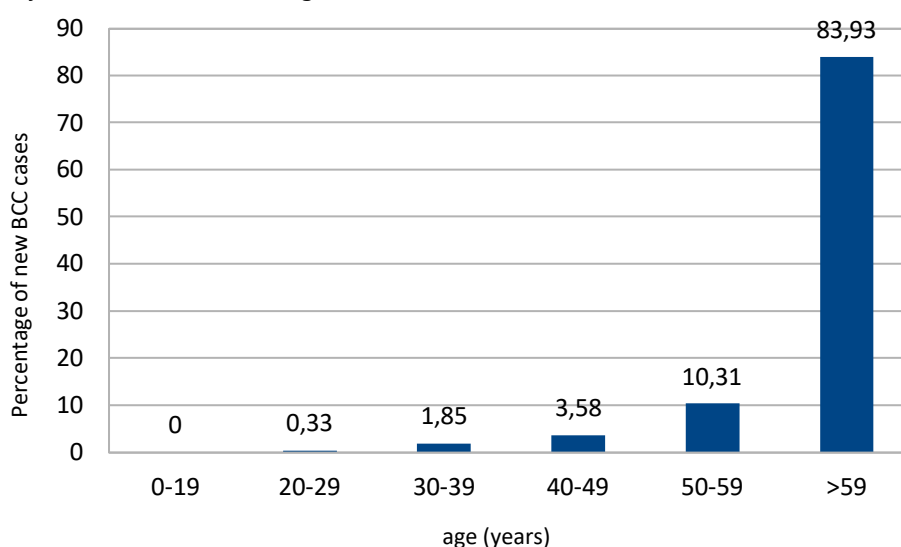


Fig. 4 Number of new BCC cases by age.

In most patients requiring outpatient treatment, BCC was usually located in the nose area (27.5%), cheeks (15.3%), forehead (8.5%) and temples (8.3%) (Table 4).

BCC location.		
Location	Number of cases	Percentage of cases
Head and neck		
Nose	253	27.5 %
Cheek	140	15.3 %
Forehead	79	8.5 %
Temple	77	8.3 %
Neck	30	3.2 %
Eye socket	26	2.8 %
Eye lid	25	2.7 %
Concha	23	2.5 %
Facial skin, not elsewhere classified	16	1.7 %
Upper lip	11	1.2 %
Lower lip	6	0.6 %
Occipital area	6	0.6 %
Neck area	3	0.3 %
Haired area of the head	3	0.3 %
Torso		
Torso, not elsewhere classified	37	4.0 %
Shoulder and shoulder area	34	3.7 %
Lumbar area	29	3.1 %
Chest	20	2.2 %
Parasternal area	11	1.2 %
Back	10	1.1 %
Collarbone	8	0.9 %
Nipple	8	0.9 %
Abdomen	7	0.7 %
Cleavage	6	0.6 %
Axillary fossa	5	0.5 %
Scrotum skin area	1	0.1 %
Upper limb		
Forearm	16	1.7 %
Shoulder joint	9	1.0 %
Lower limb		
Thigh	12	1.3 %
Lower leg	10	1.1 %
Other		
Post-operative scar	1	0.1 %

On the basis of histopathological results, the most common diagnosis of unspecified BCC was made in 347 cases. The most common specific types of basal cell carcinoma are BCC solidum (240), BCC superficiale (113), BCC exulceratum (61) and BCC pseudoadenoides (56) (Table 5).

Histopathological types of BCC. The solidum form includes the following subtypes according to incidence: exulceratum, pseudoadenoides, microerosivum, pigmentosum exulceratum, desmoplasticum, recidivans, micronodularis, cicatricans, ulceratum, microulceratum.

Histopathological diagnosis of BCC	Number of cases	Percentage of cases
Solidum	240	26.0 %
Superficile	113	12.3 %
Exulceratum	61	6.6 %
Pseudoadenoides	56	6.1 %
Nodulare	25	2.7 %
Desmoplasticum	18	2.0 %
Pigmentosum	17	1.8 %
Cicatricans	7	0.8 %
Keratoticum	7	0.8 %
Carcinomatis	6	0.7 %
Microfoci	6	0.7 %
Recidivans	6	0.7 %
Microerosivum	4	0.4 %
Pseudocysticum	4	0.4 %
Infiltrans	2	0.2 %
Clarocellulare	1	0.1 %
Fibrosans	1	0.1 %
Versimiliter	1	0.1 %
Unspecified	347	37.6 %

DISCUSSION

A steady increase in the number of patients with BCC was observed between 2005 and 2015. One of the hypotheses of this increase may be a greater awareness of the population based on prevention campaigns, as well as greater sensitivity of general practitioners referring patients to specialist clinics. Other possible factors include: higher cumulative UV exposure, increasing popularity of tanning, reduction of the ozone layer (2% over the last 20 years), increased life expectancy and increase in the percentage of older people in the population [20].

The collected data indicate that the disease mainly affects people over 59 years of age, with a predominance of women living in cities, especially middle-sized ones. The higher number of BCC cases among women and city dwellers may result from more frequent ignorance of the disease symptoms by men and poorer availability of specialist medical services in rural areas.

Therefore, despite the improvement in prognosis in recent decades, it is recommended to continue preventive measures, primarily aimed at educating the public.

The cancer was usually located on the nose, cheek, temple and forehead. This is related to the effect of ultraviolet rays on the skin and these observations do not differ significantly compared to previous studies. Therefore, the role of protective measures is emphasized,

including the use of appropriate clothing and sunscreens. However, it should be remembered that the use of sunscreens alone is insufficient. Some authors suggest that their use encourages risky behaviours in which a person who exposes him/herself more to the sun believes themselves to be fully protected [21]. No reduction in the incidence of BCC has been shown, despite the long-term use of sunscreens [22].

In recent years, however, an increase in the incidence of basal cell carcinoma of the torso has been observed [23]. Therefore, another growing problem is the widespread interest in solariums. Studies conducted by CBOS indicate that between 2003 and 2009 the percentage of people using solariums increased from 16% to 22%. These facilities were used more often by Polish women (23% in 2003 and 30% in 2009) than by Polish men (8% and 12% respectively) [24]. In response to the appeal of the World Health Organization (WHO), on 16 February 2018 the Act of 15 September 2017 on Health Protection against the Consequences of Solarium Use came into force, the aim of which is to protect human health from the harmful effects of artificial ultraviolet (UV) radiation, emitted by devices used to irradiate the skin, causing a tanning effect. According to the law, the use of solariums by minors is prohibited [25].

The most common type of cancer was the unspecified neoplasm. The lack of determination of typical tumour character may result from the coexistence of



different types of histopathological lesions. It is estimated that such a situation concerns up to 37 - 43% of cases [26]. The most common specific types of basal cell carcinoma are BCC solidum, BCC superficiale, BCC exulceratum and BCC pseudoadenoides, which is in line with previous studies.

In summary, the high incidence of BCC significantly burdens the health care system, making the disease a public health problem. Despite low mortality and rare metastases, the tumour can be locally invasive and recurrent after treatment, causing significant morbidity [27].

It should also be noted that the data presented are probably slightly undercut. This conclusion is due to several factors. Firstly, the analysis covered only patients who received treatment in an institution with a contract

with the National Health Fund. Patients who used private services were not included. Secondly, a certain group of patients with BCC never seek medical advice. These people treat themselves with their own methods or believe that they do not require medical consultation. These are usually patients with a mild course of disease. It should also be noted that in a small percentage of patients the treatment is carried out by general practitioners, while the study analysed only data from the dermatological institute.

Stricter local and national registries are required to improve monitoring of the increasing number of BCC in order to help health systems to plan preventive strategies and ensure the most effective treatment.

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Agnieszka Borzęcka-Sapko

Niepubliczny Zakład Opieki Zdrowotnej Med-Laser
Oddział Dermatologiczny
ul. Młyńska 14A
20-406 Lublin