



# Healthcare problems of a patient with melanoma skin cancer

Problemy zdrowotne i pielęgnacyjne chorego z czerniakiem skóry

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## Abstract

**Introduction and Objective.** In Poland, the number of cases of melanoma skin cancer shows an increasing trend in both genders. Its aggressiveness makes it one of the most common metastatic tumours. Melanomas have many characteristics that help in their diagnosis. These features are determined using the ABCD(E) and Glasgow criteria. Early detection of melanoma at a low local stage gives a greater chance of cure and is associated with better prognostic factors.

**Review Methods.** The article presents an overview of the current knowledge on the prevention, diagnosis and treatment of melanoma, demonstrates the need for wider use of primary prevention, and emphasizes the role of skin self-examination.

**Brief description of the state of knowledge.** Education must be targeted and focus on behaviours that the patient can influence and modify, as well as preventive actions taken to eliminate risk factors and recognize early symptoms of skin melanoma. These include: regular visits to a dermatologist and undergoing dermatoscopic examination, using sunscreen creams with a high UV factor, using special protective clothing, sunglasses and headgear when staying in the sun, moderate exposure to the sun, avoiding sunburn, and responsible use of a solarium.

**Summary.** The role of prevention and rapid diagnosis becomes crucial in the early diagnosis of melanoma and the implementation of targeted therapy. A quick response to the first symptoms may also speed up the process of diagnosis and treatment, and will influence the survival time of patients.

## Key words

cutaneous melanoma, diagnosis, prevention, treatment

## Streszczenie

**Wprowadzenie i cel pracy.** W Polsce liczba zachorowań na czerniaka skóry wykazuje tendencję wzrostową w populacji bez względu na płeć. Jego agresywność sprawia, że jest to jeden z najczęstszych guzów przerzutowych. Czerniaki mają wiele cech, które pomagają w ich diagnozie. Cechy te są określane przy użyciu kryteriów ABCD(E) i Glasgow. Wczesne wykrycie czerniaka w niskim stadium miejscowym daje większą szansę na wyleczenie i wiąże się z lepszymi czynnikami prognostycznymi.

**Metody przeglądu.** W artykule przedstawiono przegląd aktualnej wiedzy na temat profilaktyki, diagnostyki i leczenia czerniaka, wskazano na potrzebę szerszego stosowania profilaktyki pierwotnej oraz podkreślono rolę samobadania skóry.

**Opis stanu wiedzy.** Edukacja w zakresie profilaktyki czerniaka musi być ukierunkowana i powinna koncentrować się na zachowaniach, na które pacjent może wpływać i modyfikować, a także na działaniach profilaktycznych podejmowanych w celu wyeliminowania czynników ryzyka, a także rozpoznania wczesnych objawów czerniaka skóry. Należą do nich: regularne wizyty u dermatologa i poddawanie się badaniom dermatoskopowym, stosowanie kremów z filtrem przeciwsłonecznym o wysokim współczynniku UV, noszenie specjalnej odzieży ochronnej, okularów przeciwsłonecznych i nakryć głowy podczas przebywania na słońcu, umiarkowana ekspozycja na słońce, unikanie oparzeń słonecznych, odpowiedzialne korzystanie z solarium.

**Podsumowanie.** Rola profilaktyki i szybkiej diagnozy staje się kluczowa we wczesnej diagnostyce czerniaka i wdrażaniu terapii celowanej. Szybka reakcja na pierwsze objawy choroby może również przyspieszyć proces jej diagnozy i leczenia oraz wpłynąć na czas przeżycia pacjentów.

## Słowa kluczowe

czerniak skóry, diagnostyka, profilaktyka, leczenie

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## INTRODUCTION

One of the most common malignant neoplasms in the human body is skin cancer, and among them the most common are: basal cell carcinoma and squamous cell carcinoma [1]. Malignant melanoma has a lower incidence, higher malignancy, and is the leading cause of death from skin cancers.

In Poland, the number of melanoma cases is constantly increasing, both among women and men. For the last three decades, there has been an increase in the risk of cutaneous melanoma in both genders and in all age groups [2]. In 2020, more than 3,200 new cases of this cancer were registered. The median age of onset is about 50 years, and is similar in both genders. Standardized incidence rates are 4.9/100,000 for men and 5.0/100,000 for women. On the other hand, standardized mortality rates are 2.1/100,000 for men and 1.2/100,000 for women, which translates to about 762 and 668 deaths per year in recent years [3], respectively.

Melanoma can develop from a pigmented nevus and also develop *de novo* in unchanged skin [4]. It is formed from neuroectodermal pigment cells – melanocytes, which are most abundant in the basal layer of the epidermis, but also occur in the uvea, spider and soft meninges, as well as mucous membranes lining the respiratory and urogenital and gastrointestinal tracts. Melanoma can therefore be localized at all the above-mentioned locations, but it is most often localized in the skin. Mucosal melanoma is very rare and accounts for about 1.5% of all melanoma cases [5]. If the primary origin of the tumour cannot be found, an ophthalmological and ENT examination should be performed to find the point of origin of the tumor.

There are 4 main types of melanoma, the most common of which is superficially spreading melanoma, occurring in about 65% of cases, [6]. Other types include lentiginous melanoma, nodular melanoma, and acral melanoma.

Early diagnosis of cancer remains key to improving treatment outcomes. Melanoma detected at an early stage has a very good prognosis and responds well to treatment. Radical surgical treatment is the method of choice for skin cancer patients, and depending on the severity of the primary focus, is sometimes the only and sufficient treatment option. In the case of the so-called thick melanomas and lesions with ulceration, a one-year adjuvant treatment is currently recommended [7].

The most important factors increasing the risk of cancer are: intense exposure to UV radiation, both natural (sunlight) and artificial (tanning beds), chronic exposure to mechanical or chemical irritation of the skin, low concentration of melanin in the skin, as well as a burdened family history – 8–12% of patients with melanoma have a hereditary predisposition to the disease [8]. Mutations in individual genes can increase the risk of melanoma. The most common mutations predisposing to melanoma concern the following genes: BRAF, NRAS, CDKN2A. Other risk factors include certain phenotypic traits, such as blonde or red hair [9, 10].

**Clinical manifestations and diagnosis.** Various scales have been introduced for the clinical assessment of melanocytic lesions, including the Friedman scale, the ABCDE system, and the Glasgow scale.

The most well-known diagnostic tool is the American ABCD(E) system, according to which suspicious changes are indicated by the following characteristics:

- A – asymmetry: asymmetrical shape of lesions;
- B – border: uneven, jagged edges of the birthmark;
- C – colour: change in colour of the birthmark (red, black or heterogeneous);
- D – diameter: all moles with a size of more than 6 mm should be assessed;
- E – evolving: evolution over time, elevation, pressure to change [12].

However, this system allows for the identification of only a fraction of melanomas (about 50%), as not every type of melanoma meets all of the above criteria [8].

The second system facilitating the diagnosis of cutaneous melanoma is the 7-point Glasgow system, first presented in 1985, updated in 2015, which takes into account 3 larger features (2 points each): change in size, irregular shape or edges, heterogeneous colour, and 4 smaller features (1 point each): diameter  $\geq 7$  mm, signs of inflammation, oozing or the presence of scabs within the lesion, itching, or other symptoms. Obtaining at least 3 points may raise suspicion of melanoma development [11].

The recommended test used by clinicians in the initial diagnosis is dermoscopy, which is a non-invasive and inexpensive examination performed using a dermoscope. This makes it possible to visualize the epidermis (colour and structure), the dermal-epidermal border and the papillary layer of the dermis. With dermoscopy it is possible to improve diagnostic sensitivity by about 30%. The simplest technique for dermatoscopic assessment is the use of the so-called 3-point dermatoscopic scale. It is assumed that the following criteria included in the above-mentioned scale play an important role in differentiating melanoma from benign pigmented skin lesions:

- 1) asymmetry of colour and structure in the dermatoscopic image;
- 2) unusual dye mesh;
- 3) presence of blue-white structures (blue-white veil).

This method was developed as a screening tool with a sensitivity reaching 96.3% and specificity 94.2%. It is recommended that lesions that meet 2 or all the above criteria should be surgically removed. Other methods used in dermatoscopic analysis include, among others, the ABCD dermatoscopic method, pattern analysis, 7-point scale, Menzies method, or the CASH algorithm (colour, architecture/structure, symmetry, homogeneity). They are characterized by comparable sensitivity, with slightly higher specificity than the 3-point dermatoscopic scale. It is worth emphasizing that dermatoscopic evaluation methods are not used to assess lesions in specific locations, such as hands and feet, scalp, oral mucosa, or genital skin. In such cases, specific dermatoscopic algorithms are used, developed separately for each location [8, 12].

The basis for the diagnosis of a suspicious skin lesion is an excisional biopsy, performed by an elliptical incision with a narrow margin of skin of 1–2 mm. The incision is made in the long axis of the limb, and on the trunk – the incision in the long axis should be directed in the direction of regional lymph drainage. Excisional biopsy allows establishment of the diagnosis of melanoma and assessment of the thickness of the infiltrate. The suspected lesion is assessed initially clinically and then microscopically. To assess the staging of melanoma, the TNM classification is used.

Once the histopathological result has been received and the diagnosis of malignant melanoma confirmed, the patient should undergo a comprehensive assessment of the severity of the disease. The first step should be to rule-out other suspicious skin lesions or metastases in transit, that is, metastatic lesions that occur between the primary lesion and the nearest group of lymph nodes. All patients should have imaging tests performed, such as abdominal ultrasound, regional lymph node ultrasound, chest X-ray (X-ray), and laboratory tests (complete blood count, liver tests, lactate dehydrogenase – LDH). In some patients, it is necessary to extend the diagnosis with computed tomography (CT) or positron emission tomography in combination with CT (PET-CT) in the case of clinically enlarged lymph nodes or distant metastases [13, 14].

**Principles of treatment.** The basic method of surgical treatment of melanoma is excision, with an adequate margin of healthy skin. In all patients, it is recommended to completely excise the scar after the excisional biopsy of the primary lesion with appropriate margins (depending on the thickness of the melanoma infiltrate according to the Breslow scale). At the same time as radical excision of the scar after an excisional biopsy of melanoma, a sentinel lymph node biopsy is performed to assess micrometastases in the lymph nodes. The sentinel lymph node is the first lymph node in the pathway of lymph outflow from the tumour focus. If melanoma metastasis in regional lymph nodes is confirmed by fine needle biopsy or histopathological examination, lymphadenectomy should be performed in the area of regional lymphatic run-off [15].

Malignant melanoma of the skin can metastasize both locally and distantly [12]. This occurs through the blood and lymphatic vessels, and by the infiltration of tissues in the immediate vicinity of the melanoma. Metastases to the skin, lymph nodes and internal organs (mainly lungs, liver, CNS and bones) are common. The presence of distant metastases is associated with a poor prognosis and requires systemic treatment. In addition, every patient with advanced melanoma undergoes genetic testing to identify mutations in the BRAF gene. Depending on the clinical stage and the presence of the above-mentioned mutation, appropriate systemic therapy is selected – chemotherapy and/or immunotherapy, and in some cases, also radiotherapy. Patients with metastatic disease should be treated in specialized oncology centres [4, 15, 16].

**Prevention of melanoma.** Primary prevention of melanoma of the skin consists mainly in limiting exposure to ultraviolet radiation, both its artificial source (e.g. tanning beds) and natural radiation (sunlight). Methods of sun protection include: using sunscreen, wearing sunglasses, hats, protective clothing. Particular attention should be paid to people under 10 years of age, as burns in the early years are associated with twice the risk of melanoma [24]. The effectiveness of sunscreens has been the subject of research by numerous dermatological and cosmetology centres for many years. However, research conducted in 2016 shows that a sunscreen with a high sun protection factor reduces the risk of developing melanoma [17]. The Canadian Society of Dermatology recommends the use of broad-spectrum sunscreen with SPF values of 30 and above [18]. However, it should be remembered that the filter in UV creams does not completely protect skin from

radiation. Preventive recommendations include, above all, avoiding the use of tanning beds, covering skin exposed to sunlight, wearing a hat and sunglasses as basic elements of primary prevention. Do not use sunscreen to prolong your intended sun exposure [19].

As part of secondary prevention, a skin self-examination and a medical examination are recommended. Self-examination is a simple and effective screening method. Most melanomas are detected by patients or their family members. Self-examination should be carried out in accordance with the ABCDE criteria, and any suspicious lesion should be reported immediately to the general practitioner or a doctor of the appropriate specialty. A medical examination by a specialist doctor should take place once a year, and even more often in people in risk groups. The specialist must inspect the patient's body in good lighting conditions, taking into account areas that are difficult to access. In the case of a suspicious lesion, dermatoscopy is the first choice test in the initial diagnosis [20].

## DISCUSSION

Melanoma is now a serious health problem, and the number of cases has steadily increased more than 3-fold between 1980–2019. Despite the development of diagnostic and therapeutic methods, it is still characterized by a high mortality rate, especially when diagnosed at a late stage. If melanoma is diagnosed at an early stage, i.e. when the lesion is local, the 5-year survival rate reaches 70–95% [8].

Therefore, both primary and secondary prevention of this disease, as well as broadly understood patient education, are extremely important. Prevention and screening programmes conducted by specialists are increasingly being introduced in Poland and worldwide [21]. Educational programmes conducted in other countries, among others, Australia, have resulted in an effective reduction in the incidence of melanoma. Therefore, the knowledge and experience of countries that have developed an effective plan to combat this cancer with good results, should be adopted and utilised [22].

Patient education plays a significant role in preventing the development of melanoma. This task concerns not only doctors, but also increasingly nursing staff. Raising awareness of the possible risk factors and recognizing the early signs of cutaneous melanoma should be the responsibility of those working in healthcare. An important element of prophylaxis is systematic self-examination of the skin, careful observation, and in the event of disturbing changes, especially those with rapid growth dynamics, contact with a dermatologist, oncologist or surgical oncologist. Proper skin protection and care should be promoted, and avoiding the sun during peak hours should be recommended.

There are several steps that should be promoted to protect the skin from the harmful effects of solar radiation, and thus reduce the incidence of melanoma. These include:

- 1) protective clothing to reduce exposure to UV radiation, including headgear;
- 2) using creams with a high SPF at appropriate intervals;
- 3) avoid sun exposure during peak hours, between 11.00–16.00;
- 4) wearing sunglasses with UV protection;
- 5) not using a tanning bed;
- 6) skin self-examination [23].

Prevention is the key method for minimizing the incidence and mortality of cutaneous melanoma, and reducing healthcare costs. Prevention measures should be taken primarily on children, as younger skin is more susceptible to damage caused by intense UV radiation. Melanoma prevention should also be promoted among the elderly, as this social group has the highest incidence rate, and the treatment results are the worst.

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