PROFILE OF MALIGNANT MELANOMA IN BRAZIL: INCIDENCE AND ASSOCIATED FACTORS IN THE SOUTHERN REGION BETWEEN 2019 AND 2024

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ABSTRACT

Malignant melanoma is a skin neoplasm derived from the pathological transformation of melanocytes and represents approximately 5% of malignant skin neoplasms. Its highly aggressive nature and the significant increase in its incidence in recent decades require early diagnosis to improve outcomes. To evaluate the difference in the prevalence of malignant melanoma in the South region in relation to the other regions of Brazil, as well as to compare the forms of presentation of the disease according to stage, age group and sex. This is an observational, cross-sectional study with a quantitative approach, considering cases of melanoma in situ between 2019-2024. Secondary data from the Notifiable Diseases Information System (SINAN) managed by the Department of Informatics of the Unified Health System (DATASUS) were used. According to the data collected, the South region has the highest number of cases of malignant melanoma of the skin during the period from 2019 to 2024, registering 12,253 cases out of a total of 30,079 cases in the country, which corresponds to 40.7% of the total cases. The age of 60 to 64 years was the most affected in the South region, with 1,661 of the 3,873 cases in the country, which is equivalent to 42.9% of the total in this age group and 13.5% of the total cases in the region. In the South, there were 997 records of stage 4 melanomas, equivalent to 33.6% of the total of 2,971 cases, being slightly behind only the Southeast region, with 1004 cases (33.8%). Of the diagnoses in the South region, 6,360 were made in women and 5,893 in men, which represents a number 3.8% higher in women. This difference is the largest among the regions, since females were 1.2%, 2.5% and 1.94% more affected than males in the Northeast, Southeast and Central-West regions, respectively. Malignant melanoma, although it is a less frequent neoplasm compared to other types of skin cancer, has a high mortality, especially in cases diagnosed late. This study revealed that the southern region of Brazil concentrates the highest number of cases

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of malignant melanoma in the analyzed period, representing 40.7% of national diagnoses between 2019 and 2024. This scenario is closely linked to the predominance of risk factors in the local population, such as the higher percentage of individuals with clear phototypes, as a result of intense European immigration to the region.

Keywords: Malignant Melanoma. Regional Prevalence. Early diagnosis. Phototype: Light.

INTRODUCTION

PROFILE OF MALIGNANT MELANOMA IN BRAZIL: INCIDENCE AND ASSOCIATED FACTORS IN THE SOUTHERN REGION BETWEEN 2019 AND 2024

Malignant melanoma is a highly aggressive cutaneous neoplasm, whose incidence has shown a significant increase in recent decades. This tumor, derived from the pathological transformation of melanocytes — cells responsible for the production of melanin — represents approximately 5% of malignant skin neoplasms. Although it is a smaller portion of skin cancers, melanoma is the leading cause of mortality among these tumors, given its resistance to conventional treatments.

Epidemiologically, melanoma is more prevalent in individuals with Fitzpatrick phototypes I and II and in age groups comprising young to middle-aged adults, with a higher occurrence in women at younger ages and in men after 50 years of age. In tropical countries, such as Brazil, the incidence of the disease tends to be high in regions with higher ultraviolet radiation.

The etiopathogenesis of malignant melanoma has not been completely elucidated, but the presence of predisposing factors, such as lighter skin phototypes, number and specific types of pigmented nevi, as well as intermittent and intense sun exposure, often accompanied by episodes of sunburn, seems to play a central role in its genesis. Early diagnosis is essential, as well as histopathological analysis of suspicious lesions, allowing the evaluation of tumor thickness and the level of dermal invasion, both essential for determining the prognosis.

The main diagnostic criteria for differentiating suspicious melanocytic lesions include the "ABCDs" (asymmetry, borders, color, and diameter). Pigmented lesions that fit these criteria should undergo full-thickness biopsy. In addition, preventive strategies, such as wearing protective clothing, seeking shade, and reducing sun exposure at peak times, are essential to reduce the risk of developing malignant melanoma. Although the role of population screening for skin cancer remains uncertain, regular dermatological examinations and awareness of skin cancer prevention are important steps towards reducing mortality.

Given the severity and increased incidence of malignant melanoma, it is essential to conduct a detailed study that highlights the most affected populations and regions in Brazil, identifying the groups with the greatest predisposition and analyzing risk factors, preventive practices, and early diagnosis methods. This will allow targeting more effective and specific

interventions to reduce the morbidity and mortality associated with this neoplasm in the country.

METHODOLOGY

This is an observational, cross-sectional study with a quantitative approach, considering cases of melanoma in situ between 2019-2024. Secondary data from the Notifiable Diseases Information System (SINAN) managed by the Department of Informatics of the Unified Health System (DATASUS) were used, through the website http://tabnet.datasus.gov.br/cgi/deftohtm.exe?sinannet/cnv/violebr.def.

The variables used for case collection were the profile of the malignant melanoma cases analyzed, such as region of residence, detailed diagnosis, year of diagnosis, staging, age group, and gender. The data were exported to Excel to calculate the incidence of cases in the South region and in the other regions and were used to make graphs on an online platform.

The population data necessary for the calculation of incidence come from the DATASUS platform. The resident population of each Brazilian region was used through the Population Projection of the Federation Units by sex, age and age groups: 2010-2070 (2024 edition) of the Brazilian Institute of Geography and Statistics (IBGE). The incidence calculation was performed using the number of cases in each Brazilian region divided by the resident population, and the results of these calculations were multiplied by 100,000 individuals.

Because the present study is based on secondary data from a public database, without any identification of patients, this study is exempt from being submitted to the Research Ethics Committee, in accordance with CNS resolution 466/2012.

RESULTS

According to the data collected, among the five regions of the country, the South region has the highest number of cases of malignant melanoma of the skin during the period from 2019 to 2024. Considering the number of cases by detailed diagnosis according to region, among the total of 30,079 cases in the country, the South registered 12,253 of them, corresponding to 40.7% of the total cases and representing the highest number among the other regions, followed by the Southeast region with 11,624 cases

(38.6%), Northeast with 3,813 (12.7%), Central-West with 1,699 (5.64%) and North with 690 (2.3%).

Figure 01: Melanoma diagnoses in Brazil between 2019 and 2024 by region
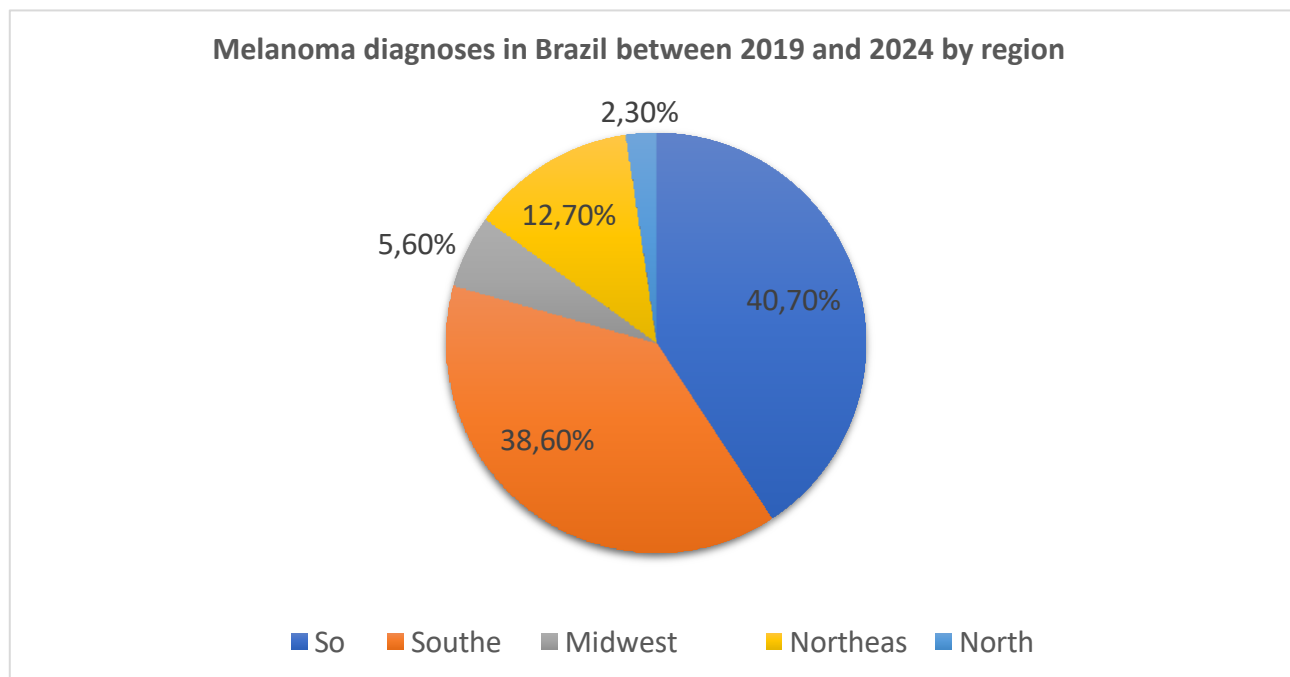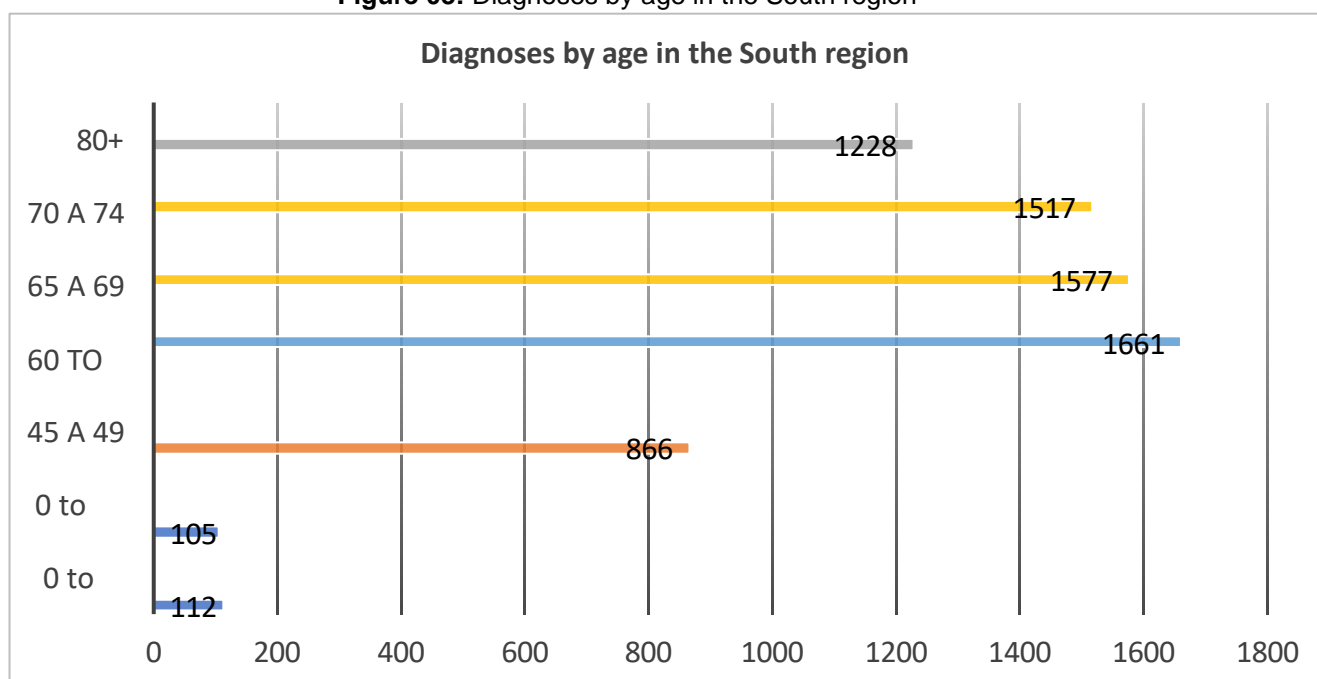

Source: Authorship.

Regarding the age group, the age group of 60 to 64 years was the most affected in the South region, as well as in the North and Midwest. There were 3,873 cases in this age group in the country, of which 1,661 were from the South region, which is equivalent to 42.9% of the total in this age group and 13.5% of the total cases in the region.

Figure 02: Diagnoses in patients aged 60 to 64 years by region

DIAGNOSES IN PATIENTS AGED 60 TO 64 BY REGION

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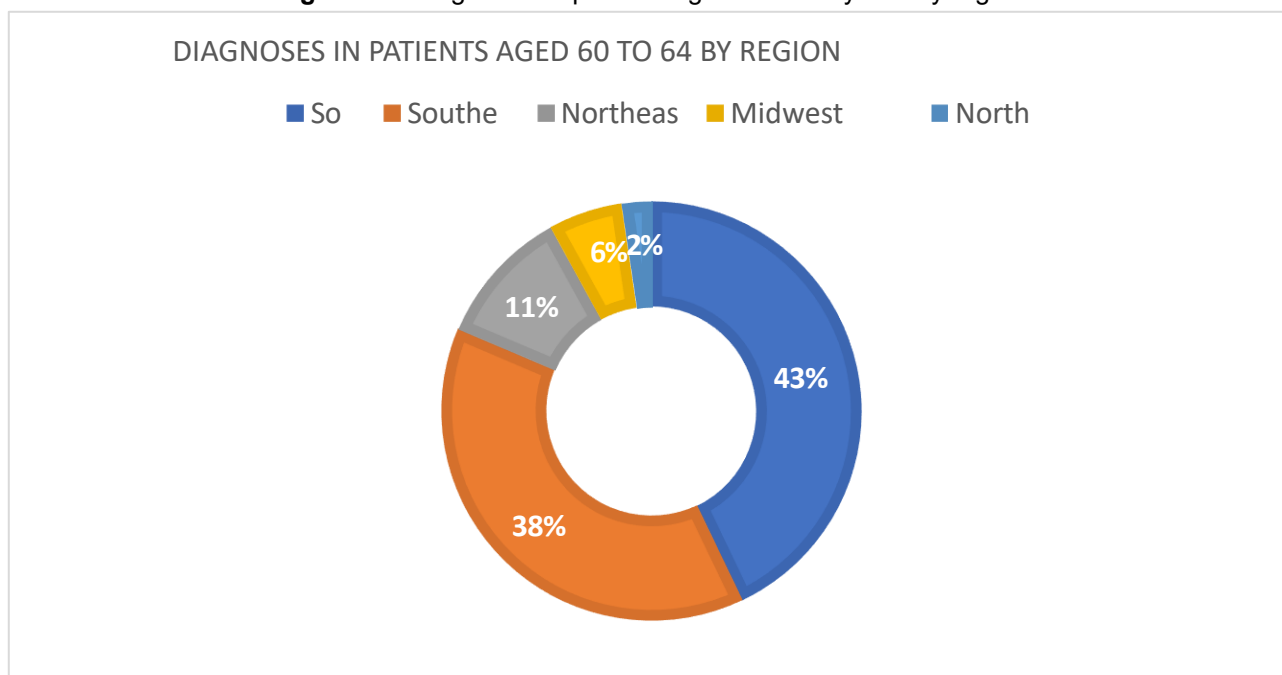
Source: Authorship.

Figure 03: Diagnoses by age in the South region

Diagnoses by age in the South region

Source: Authorship.

In view of the staging of melanoma, 2,971 cases were classified as stage 4 in the country, corresponding to the majority of cases in all regions. In the south, there were 997 records, equivalent to 33.6% of the total cases with stage 4, being slightly behind only the Southeast region, with 1004 cases (33.8%).

Figure 04: Diagnoses with stage 4 in Brazil
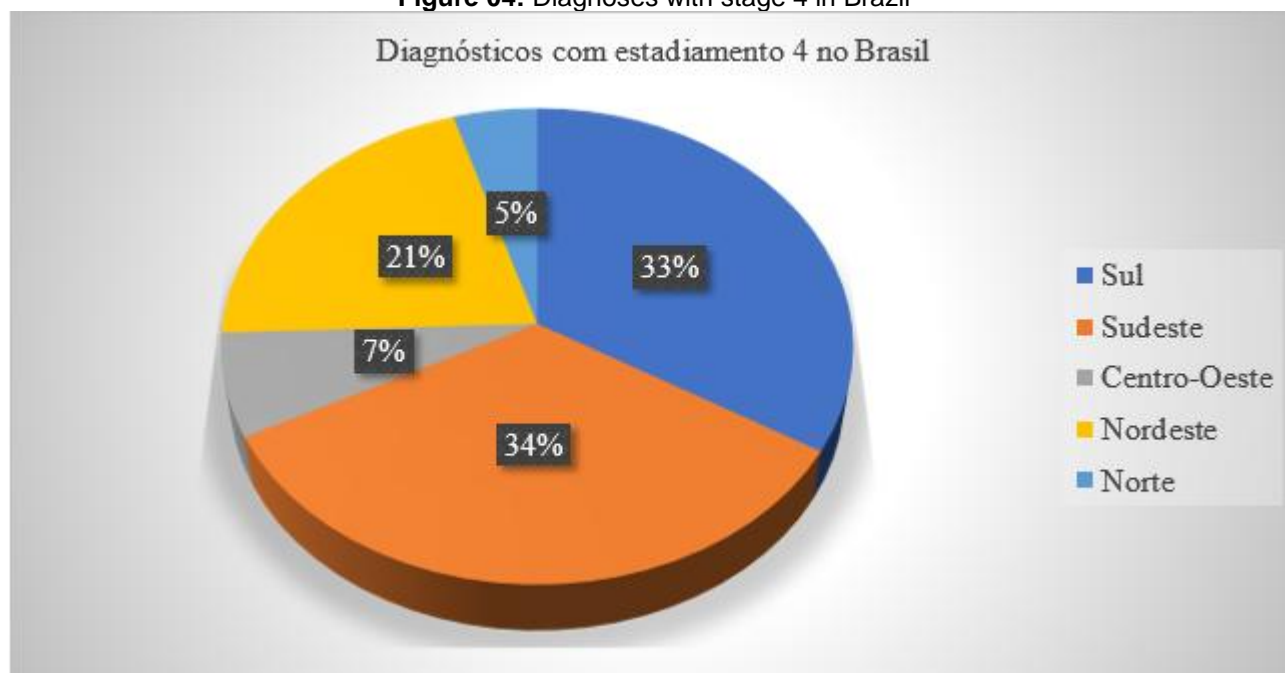
Source: Authorship.

Regarding the gender of the patients, more women were diagnosed than men throughout the country, with the exception of the North region, in which the number of men affected (376) was 8% higher than that of women (314). Of the diagnoses in the South region, 6,360 were made in women and 5,893 in men, which represents a number 3.8% higher in women. This difference is the largest among the regions, since females were 1.2%, 2.5% and 1.94% more affected than males in the Northeast, Southeast and Central-West regions, respectively.

Figure 05: Cases by sex in the South region
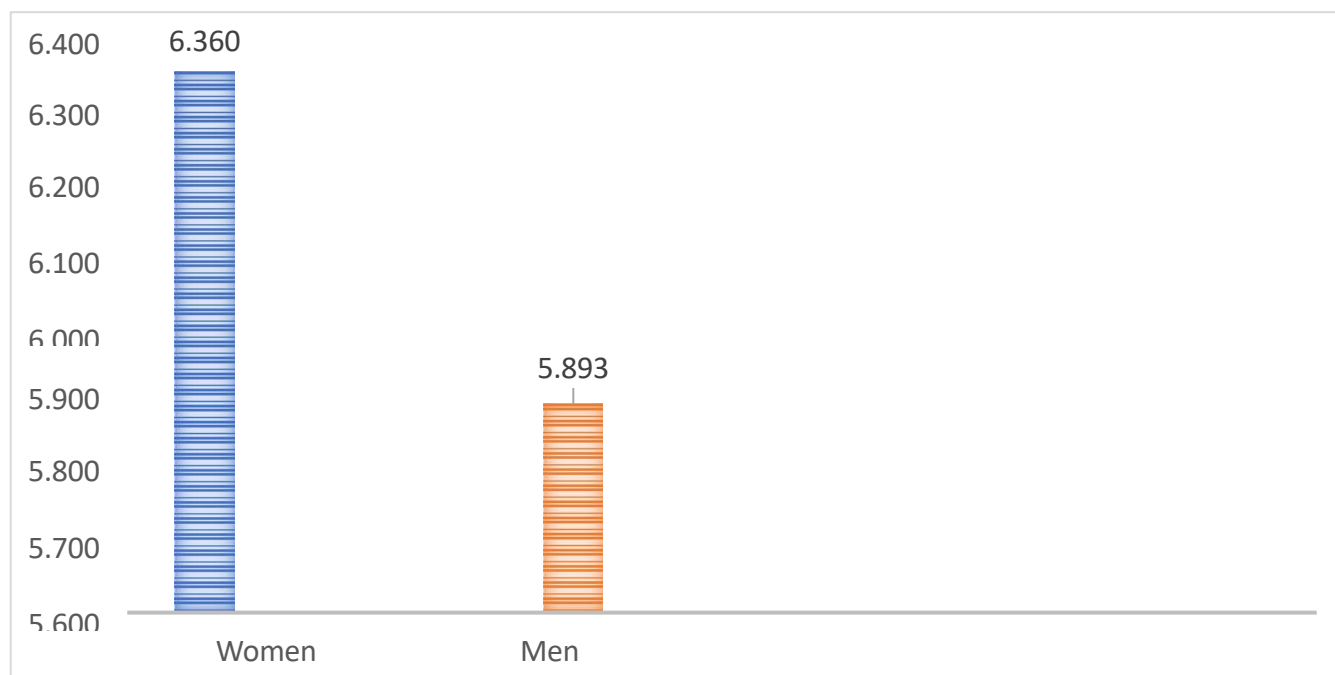
DISCUSSION

The ethnic composition of the southern region of Brazil is closely related to the history of the country and the world. Political and economic factors stimulated European immigration to the region, especially in the nineteenth and twentieth centuries, such as coffee plantations, the need for territorial occupation and World War II. This context justifies the predominance of the white population in the region, which represents the largest proportion of whites (72.6%) in the country and brings together half of the Brazilian municipalities in which the population is mostly white, according to the 2022 Demographic Census carried out by the IBGE (11).

Light skin, blond or red hair, light eyes, and freckles are known to be associated with the development of melanomas, which increase the risk by two to four times according to a meta-analysis of observational studies (10). In addition, melanomas are related to intermittent but intense exposure to the sun, such as heat stroke (1-4), especially during childhood and adolescence: it is estimated that individuals who had five or more heat strokes prior to adulthood have a two-fold increased risk of developing melanomas (1-7). This factor explains the relationship between fair skin and the risk of melanoma, given its greater sensitivity to the sun. Therefore, considering its mostly European descent, the population of Southern Brazil has several risk factors for the development of melanomas,

which is probably related to the higher records of cases by DATASUS compared to other regions.

In addition, the incidence of melanoma is higher in individuals who migrated from the Northern Hemisphere to equatorial latitudes, especially among those who did so during childhood (8,9). Therefore, this factor is potentially related to the incidence of skin neoplasms in the southern region described by the data collection, considering the history of European immigration of mainly German and Italian populations during the nineteenth and twentieth centuries.

Regarding the Cases by Staging according to Region, the values found for staging 4 draw attention, since it is the only topic in which the South does not represent the largest number of records, but the Southeast region. Despite this, the difference is minimal, being only 7 cases. Thus, when analyzing this data, one must consider the discrepancy between the total population of the two regions: the Southeast maintained the title of the most populous in Brazil between 2019 and 2024, with about 85 million inhabitants, while the population of the South is restricted to approximately 30 million. In this sense, considering the proximity of the number of staging cases 4, the proportion of records in the South is higher than that of the Southeast.

In addition, according to the data analyzed, the number of women affected by melanoma in situ is higher than the number of men in all Brazilian regions, with the exception of the North region. However, when analyzing the risk of occurrence of this neoplasm in the female population, it is noted that women living in the South region have a higher risk of developing the disease when compared to those living in the other regions. There is also an important numerical proximity of the risk of developing melanoma in situ in women between the South (51.9) and Southeast (51.2) regions, and this statistical data is slightly higher in the former. However, it is relevant to consider the population discrepancy between the two regions, with the Southeast region remaining more populous than the South region throughout the period analyzed in the present study. Thus, proportionally, the risk of melanoma in situ in women in the South is supposedly more worrisome than in women in the Southeast.

Certain factors possibly contribute to a higher occurrence of malignant melanoma in the female population of southern Brazil. First, there is evidence that the presence of cutaneous estrogen receptors, especially RBS, has a protective factor against the development of melanoma cells. This effect presents an important reduction during

menopause, in which estrogen production is reduced, which is corroborated by the reduction in survival of postmenopausal women with melanoma compared to younger women. (11) However, studies presenting this conclusion are limited, and further investigation is needed to consolidate this mechanism as a possible contributor to the greater development of malignant melanoma in postmenopausal patients.

CONCLUSION

Malignant melanoma, although it is a less frequent neoplasm compared to other types of skin cancer, has a high mortality, especially in cases diagnosed late. This study revealed that the southern region of Brazil concentrates the highest number of cases of malignant melanoma in the analyzed period, representing 40.7% of national diagnoses between 2019 and 2024. This scenario is closely linked to the predominance of risk factors in the local population, such as the higher percentage of individuals with clear phototypes, as a result of intense European immigration to the region.

ACKNOWLEDGMENTS

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