Breslow thickness and Clark level among melanoma patients in Albania

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Abstract

Aim: Malignant melanoma (MM) is a neoplasia, derived from melanocytes. Histopathological features of melanoma in Albania are poorly documented. The aim of this study was to describe the main histopathological features of melanoma including Breslow thickness and Clark level among melanoma patients in Albania.
Method: This was a retrospective study carried out at the Department of Pathology, in the University Hospital Center "Mother Teresa" Tirana, Albania, during January 2005 to December 2009 and consisted of the following variables: age at the moment of the diagnosis, gender, anatomic localization of the lesion, Breslow thickness, Clark level of cutaneous melanoma and clinico-morphological correlation. We analyzed all slides by formaline fixed paraffin-embedded in the sample of patients with melanoma.
Results: 84 patients were diagnosed with melanoma for the first time, of whom 58.3% were male and 41.7% female. Anatomic localization was as follows: 71.4% cutaneous, 16.6% cerebral (metastases) and 12% ocular. Mean age of melanoma patients was higher in males than in females (55.29 years vs. 49.16 years, respectively, $P<0.05$). Mean Breslow thickness for cutaneous melanoma in males was 5.6 mm and in females 2.96 mm ($P<0.05$). Mean Clark level in males was 3.6 and in females 2.6.
Conclusion: Melanoma is an increasing pathology in the Albanian population. Breslow thickness and Clark level should be performed in every biopsy of melanoma, because they are very important histopathological prognostic factors determining the modality of treatment. These data should inform early detection and prevention strategies in order to lower the increasing burden of melanoma in Albania.

Keywords: biopsy, Breslow thickness, Clark level, melanoma.

Introduction

Malignant melanoma is the most aggressive skin cancer that accounts approximately 4% of skin cancer (1). Worldwide, there were about 160,000 new cases of melanoma, and about 40,800 deaths from this pathology in 2012 (2).

Melanoma derives from melanocytes and there are some risk factors developing melanoma such as family history of melanoma, dysplastic nevi, an increased number of nevi and ultraviolet radiation (3). Surgery is the treatment of choice in early stage of the disease, while chemotherapy is used in late stage with a worse prognosis (4).

There are four type of melanoma: superficial spreading melanoma, nodular melanoma, acral melanoma and lentiginous melanoma.

The main histologic factors of cutanous melanoma are Breslow thickness, Clark level, mitotic rate, ulceration, vascular invasion and tumor infiltrating lymphocytes. Melanoma can develop from pre existing nevi or de novo.

Breslow thickness and Clark level are the two most useful histopathological prognostic factors of cutaneous malignant melanoma.

Breslow thickness was used for the first time by pathologist Alexander Breslow in 1970, and means thickness from granular layer of the epidermis to the deepest invasion of melanocytes of the skin (5). Melanomas with a Breslow thickness less than 0.76 mm have a 10-years survival rate about 95% (6-10).

Clark level is used since 1969 from pathologist Wallace H. Clark, and is associated with the ability of melanocytes to infiltrate all layers of skin (epidermis, papillary dermis, reticular dermis and fat tissue). There are five Clark levels (7,8). Tumorigenesis passes in two phases: radial growth phase and vertical growth phase.

The aim of this study was to assess: i) the distribution of melanoma according to anatomic localization (skin, eye, metastasis); ii) the distribution of cutaneous melanoma according to age and gender; iii) mean Breslow thickness and Clark level of cutaneous melanoma in Albanian population and; iv) clinical-morphological correlation of the cutaneous melanoma.

Methods

This was a retrospective study carried out at the Department of Pathology, in the University Hospital Center "Mother Teresa", Tirana, which is the main diagnostic center in Albania for patients diagnosed with this type of tumor. The data collecting team scrutinized all histopathological charts and recorded all cases of patients diagnosed with melanoma.

From histopathological charts where the diagnosis of melanoma was confirmed, the following information was retrieved: age at the moment of the diagnosis, gender and anatomic localization of the lesion. Each histopathological chart was identified with a personal number that corresponded with a specific formaline fixed paraffine embedded.

We examined all slides prepared by formaline fixed paraffin embedded of patients with melanoma with ocular microscope Leica DM 2500. Used stains were: Hematoxilyne-Eosine, Trichrome, Gomori.

In total, 84 patients with melanoma were diagnosed during January 2005 to December 2009.

Only patients with a diagnosis of melanoma, set for the first time, were included in this study.

SPSS, version 19.0, Chi square test were used for data analysis.

Results

In total, there were 84 patients diagnosed with melanoma during the period of 2005-2009.

Table 1 shows the percentage of melanoma biopsy, for every year of the study. It can be noted that the number of melanomas has increased.

Table 1. Share of melanoma over the total biopsy samples examined

Year	Number of cases	Total biopsy	Percentage of melanoma
2005	10	8260	0.12%
2006	23	8990	0.26%
2007	16	9622	0.17%
2008	13	9765	0.14%
2009	22	11467	0.19%

The majority of patients were 58.3% (n=49) male and 41.7% (n=35) female.

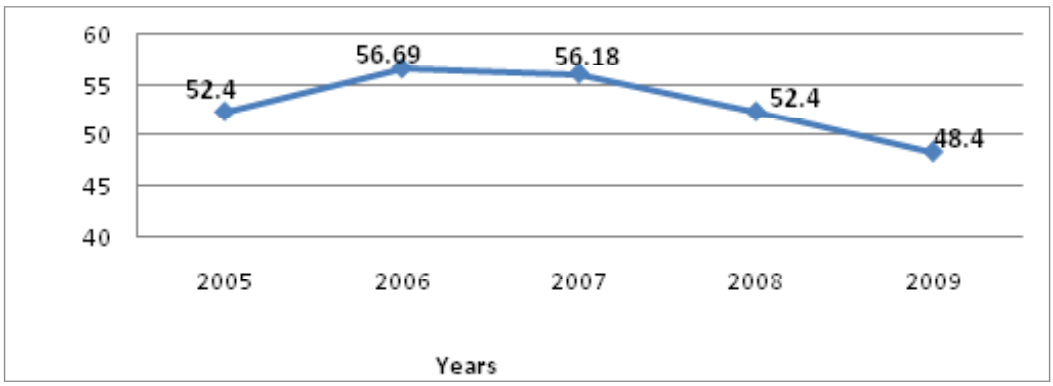
Table 2 presents the distribution of melanoma. As it is easily noticed, the most common localization is skin.

Table 2. Anatomic localization of melanoma

Variables	Total
Cutaneous	60 (71.4%)
Ocular	10 (12%)
Metastasis	14 (16.6%)
Total	84 (100%)

Figure 1 shows the average age of patients when they were first diagnosed with melanoma. It can be noted that the average age varies a lot over the years, being around 48 and 57 years old.

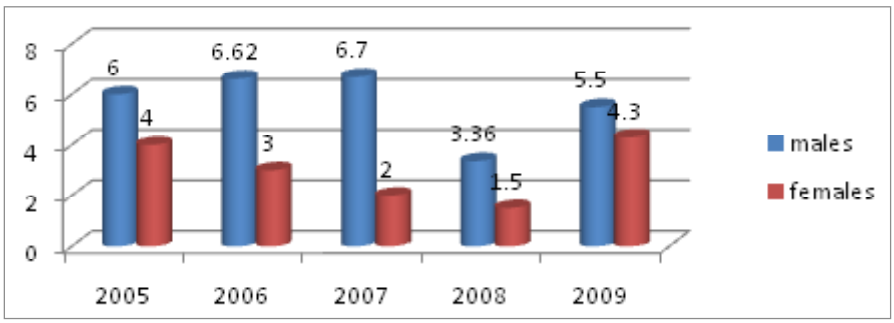
Figure 1. Mean age of the patients with Melanoma during 2005-2009



The mean age of melanoma patients was higher for males than females (55.29 years vs. 49.16 years, respectively, P=0.03) (data not shown in tables).

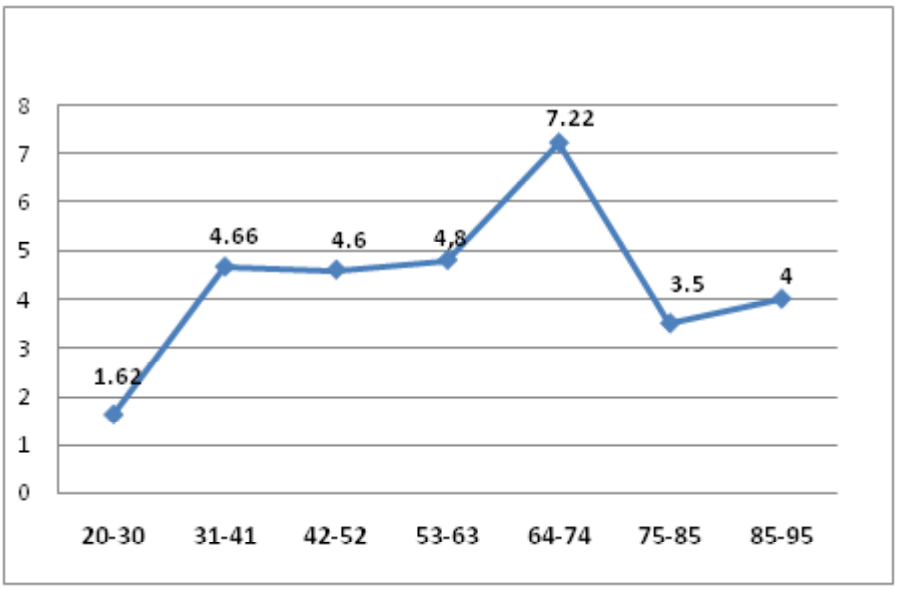
Mean Breslow thickness for all years of the study in males was 5.6 mm and in females 2.96 mm ($p<0.05$) (Figure 2).

Figure 2. Mean Breslow thickness for each year of the study



Breslow thickness is lower in young people than in older and varies from 1.62 mm (20-30) to 7.22mm (64-74) (Figure 3).

Figure 3. Mean Breslow thickness according to age



The peak mean age with highest thickness of cutaneous melanoma is between age 64-74 years ($p<0.000$).

Regarding Clark level, most common level of presenting cutaneous melanoma was Clark level 4 (melanocytes infiltrate in whole reticular dermis), while in 23% of them Clark level cannot be assessed, because of the incisional biopsy performed (Figure 4).

Figure 4. Clark level in cutaneous melanoma during 2005-2009

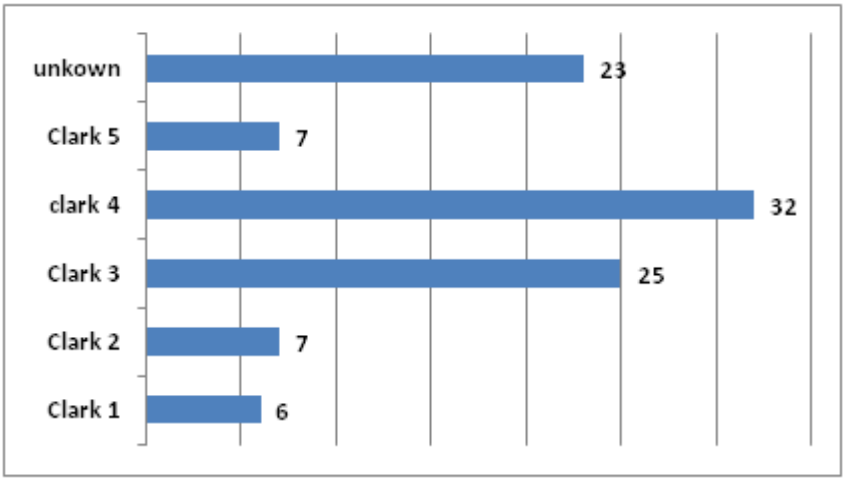
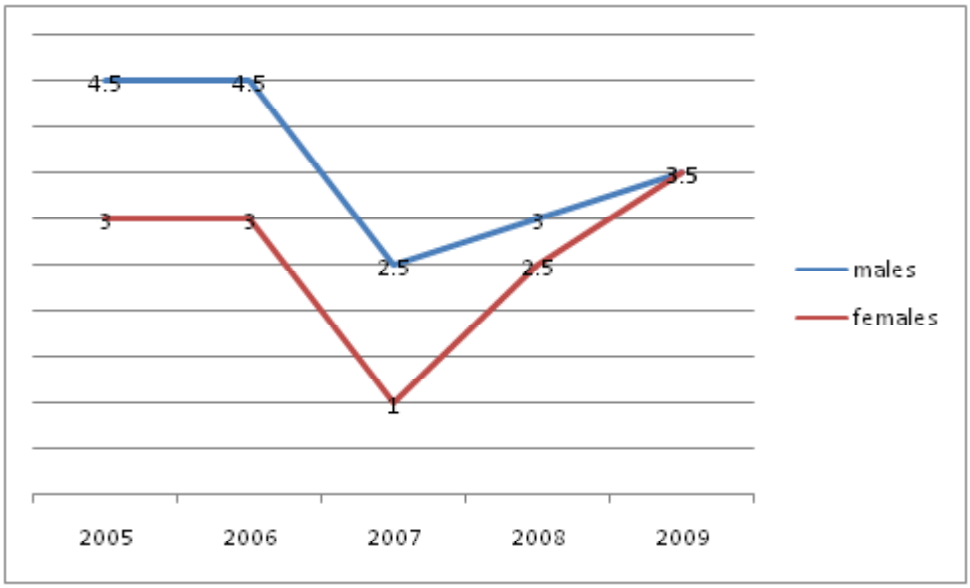


Figure 5. Mean Clark level male to female during 2005-2009



In Figure 5 it is easily noticed that Clark level is lower in females than male patients.

Clinico-morphological correlation for years in the study is 41.7% for years 2005-2009 (Table 3).

Table 3. Clinico-morphological correlation of melanoma during 2005-2009

2005-2009	Clinical diagnosis	Histopathological diagnosis	Percent
Melanoma	35	35	41.70%
Skin cancer	14	14	16.70%
Papilloma	3	3	3.50%
Nevus	14	14	16.70%
Others	18	18	21.40%
Total	84	84	100.00%

Discussion

Our main objectives was to present not only an overview for situation of melanoma, but also to present Breslow thickness and Clark level of cutaneous melanoma in Albanian population during 2005-2009. They are the most important prognostic histopathological factors of cutaneous melanoma.

We found that 84 individuals were first diagnosed with melanoma during this period with an increa)-sing incidence rate (over the total of biopsy) varying from 0.12% in 0.19%. This finding in our study is concordant to that of other studies (11). In Albania the frequency of this pathology is apparently on the rise. The majority of melanoma patients were males. This finding is consistent with what has been reported in other similar studies (12).

Also, it was noticed an increase in the proportion of younger individuals being diagnosed for the first time with melanoma over time in Albania.

We found that the melanoma was more frequent among 48 and 57 years. This may be linked to the accumulative damage caused by sun exposure during many years of life. This finding in our study is concordant to that of other studies (13,14).

We strongly believe that the steady increase of the incidence over the years is also attributed to the raise of awareness on the risk of skin cancers among the people due to TV and magazine information, publicity campaigns from the Albanian Society of Dermatologists and subsequent increased contacts with the medical staff, better self-inspection from the patients and improvement of diagnostic techniques in our country.

Regarding the Breslow thickness of melanoma and Clark level of invasion in our study, appears to be higher than that reported in several studies (15,16). This means a worse prognosis of Albanian cutaneous melanoma patients.

Breslow and Clark are higher in male than females. Our suggestion is that those working outdoors more frequently are men, such as: farmers, policemen, construction workers, etc., so in these conditions they are more exposed to high ultraviolet radiation.

Age of patients correlated with melanoma thickness ($p<0.05$), and older patients presented with thicker lesions. Also this finding is consistent with what has been reported in other similar studies (17).

Conclusion

Melanoma is rising fast all over the world and also in Albanian population. Melanoma is more frequent in males and other people who used to expose to ultraviolet radiation.

Deeper tumors correlate with more unfavorable patient disease prognosis. This disease in Albania carries a lot of morbidity due to late presentation.

Thickness of the tumor and the level of invasion in lower dermis are very important prognostic factors, in helping health public professionals for the early detection and prevention strategies.

In order to reduce the incidence of melanoma there is a need for routine dermatologic consulting, dermatoscopy campaigns and preventive activities especially in young people, children, teenagers and their parents (18-21).

Conflicts of interest: None declared.

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