

ORIGINAL ARTICLES

Changes in Incidence of Malignant Melanoma in the Last 19 Years in a Tertiary Hospital on the Mediterranean Coast

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Abstract. *Introduction.* The incidence of melanoma has increased more than that of any other type of malignant tumor. Our aim was to analyze the changes in incidence of cutaneous melanoma in recent years in a Mediterranean population.

Material and methods. Patients with melanoma diagnosed between 1988 and 2006 were included in the study. Data from the first half of this period were compared with data from the second half.

Results. The number of in situ melanomas increased from 36/302 cases (11.92%) in the first half of the period to 224/724 (30.94%) in the second half. Melanomas measuring more than 4 mm increased from 29/302 cases (9.60%) to 62/724 (8.56%). The mean maximum thickness for the whole study period was 1.91 mm and was similar for both halves.

Conclusions. The increase in incidence of melanoma in our population was due mainly to an increase in incipient cases. The proportion of melanomas larger than 4 mm remained constant, although, in absolute terms, twice as many such melanomas were detected per year. We believe that campaigns for prevention and early detection must continue, and should focus in particular on the older population.

Key words: Catalonia, Spain, epidemiology, melanoma, Breslow thickness, skin.

EVOLUCIÓN DEL MELANOMA MALIGNO CUTÁNEO EN LOS ÚLTIMOS 19 AÑOS EN UN HOSPITAL TERCIARIO DE LA CUENCA MEDITERRÁNEA

Resumen. *Introducción.* La incidencia del melanoma ha aumentado más que la de ninguna otra neoplasia maligna. Nuestro objetivo fue analizar la evolución del melanoma cutáneo en los últimos años en una población mediterránea.

Material y métodos. Los pacientes con melanoma diagnosticados entre 1988-2006 fueron incluidos en el estudio. Se comparan los datos de la primera mitad con la segunda mitad del periodo analizado.

Resultados. El número de melanomas *in situ* pasó de 36/302 casos (11,92 %) en la primera mitad del periodo a 224/724 (30,94 %) en la segunda. Los melanomas mayores de 4 mm pasaron de 29/302 casos (9,60 %) a 62/724 (8,56 %). La media de la profundidad máxima fue 1,91 mm y se mantuvo estable a lo largo del periodo.

Conclusiones. El aumento de incidencia del melanoma en nuestra población se debe mayoritariamente al incremento de casos incipientes. Sin embargo, se mantiene estable la proporción de melanomas mayores de 4 mm, y en números absolutos se ha duplicado el número anual de melanomas con estas dimensiones. Consideramos que hay que seguir insistiendo en campañas de prevención y detección precoz, especialmente dirigidas a la población de mayor edad.

Palabras clave: Cataluña, España, epidemiología, melanoma, índice de Breslow, piel.

Introduction

The incidence of cutaneous melanoma has increased in recent decades more than that of any other malignant tumor.¹ In the United States it is the most common type of cancer in men aged 25 to 30 years and is the second most common cancer, after breast cancer, in women aged 30 to 35 years.² Although there are few studies on the epidemiology of

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melanoma in Spain, an increase in the incidence of the tumor has also been detected in recent decades.^{3,4}

The most important prognostic factor in primary malignant melanoma limited to the skin is the maximum depth of invasion of the primary tumor (Breslow thickness). The aim of this study was to analyze the changes in the incidence of cutaneous melanoma over the past 19 years in a Mediterranean population.

Material and Methods

All patients with cutaneous malignant melanoma diagnosed and treated in Hospital de Bellvitge, Barcelona, between 1988 and 2006 were included in the study. This is a university-associated tertiary hospital that serves a population of approximately 1 million individuals. We only included those cases with a histologic diagnosis made in Hospital de Bellvitge, meaning that all the tumors were diagnosed and evaluated by the same team. The clinical data were obtained from the patients' medical records. The histologic data reviewed were the maximum depth of invasion or Breslow thickness (distance in millimeters from the granular layer of the epidermis to the point of greatest depth of invasion of the tumor) and the Clark levels of invasion (level I, melanoma confined to the epidermis; level II, invasion of the papillary dermis; level III, invasion of the full thickness of the papillary dermis to the junction with the reticular dermis; level IV, invasion of the reticular dermis; and level V, invasion of the hypodermis).

The characteristics of the population for the first 10 years of the study period were compared with those for the following 9 years.

Results

Between 1988 and 2006, 1026 patients with cutaneous malignant melanoma were diagnosed and treated in Hospital Universitario de Bellvitge, Barcelona. There were 417 (40.6%) men and 609 (59.4%) women and the mean age was 53.7 years (men, 53.8 years; women, 53.6 years).

In situ melanoma (Tis) was detected in 260 cases and invasive melanoma in 766. The invasive melanomas had a maximum depth of invasion of less than 1 mm (T1) in 350 cases, between 1.01 and 2 mm (T2) in 178 cases, between 2.01 and 4 mm (T3) in 102 cases, and more than 4 mm (T4) in 91 cases; the depth of invasion was not considered evaluable in 45 cases. The mean maximum depth of invasion was 1.91 mm and this remained stable over the study period.

With regard to the levels of invasion, 260 cases were Clark level I, 74 level II, 344 level III, 236 level IV, and 38 level V; the level of invasion was not considered to be evaluable in 74 cases.

Table. Comparison Between the First and Second Halves of the Study Period

	1988-1997	1998-2006	Total
	n = 302	n = 724	n = 1026
Mean age, y	50.94	54.82	53.68
Sex:			
Male	122	295	417
Female	180	429	609
Clark level			
I	36	224	260
II	34	40	74
III	116	228	344
IV	83	153	236
V	12	26	38
Not evaluable	21	53	74
Mean Breslow thickness, mm	1.99	1.86	1.91
Breslow thickness categories			
Tis (in situ)	36	224	260
T1 (< 1 mm)	101	249	350
T2 (1.01-2 mm)	78	100	178
T3 (2.01-4 mm)	39	63	102
T4 (> 4 mm)	29	62	91
Not evaluable	19	26	45

The Table shows a comparison of the data obtained in the first 10 years of the study period with the data from the last 9 years. The number of cases diagnosed and the proportion of patients with in situ melanoma and with invasion greater than 4 mm are shown for each year in Figure 1. The mean maximum depth of invasion of the invasive melanomas (excluding cases of in situ melanoma) is shown for each year in Figure 2.

Discussion

The incidence of cutaneous melanoma has increased in most parts of the world in recent decades. In the United States, the incidence has risen from 7.5 cases per 100 000 inhabitants in 1973 to 21.9 cases per 100 000 inhabitants in 2002.⁵ However, extrapolation of the epidemiologic data from Anglo-Saxon countries may not reflect the reality of the Mediterranean population, which has a very different phenotype, genotype, and habits relating to sunlight exposure.³ Although some data obtained in Europe in recent years suggest that the increase in the incidence of cutaneous melanoma has slowed down, and that this incidence is decreasing in the young population in some northern European countries, it continues to increase in most European countries.^{5,6} In Spain, melanoma is not as common as in other developed countries. Although there are no

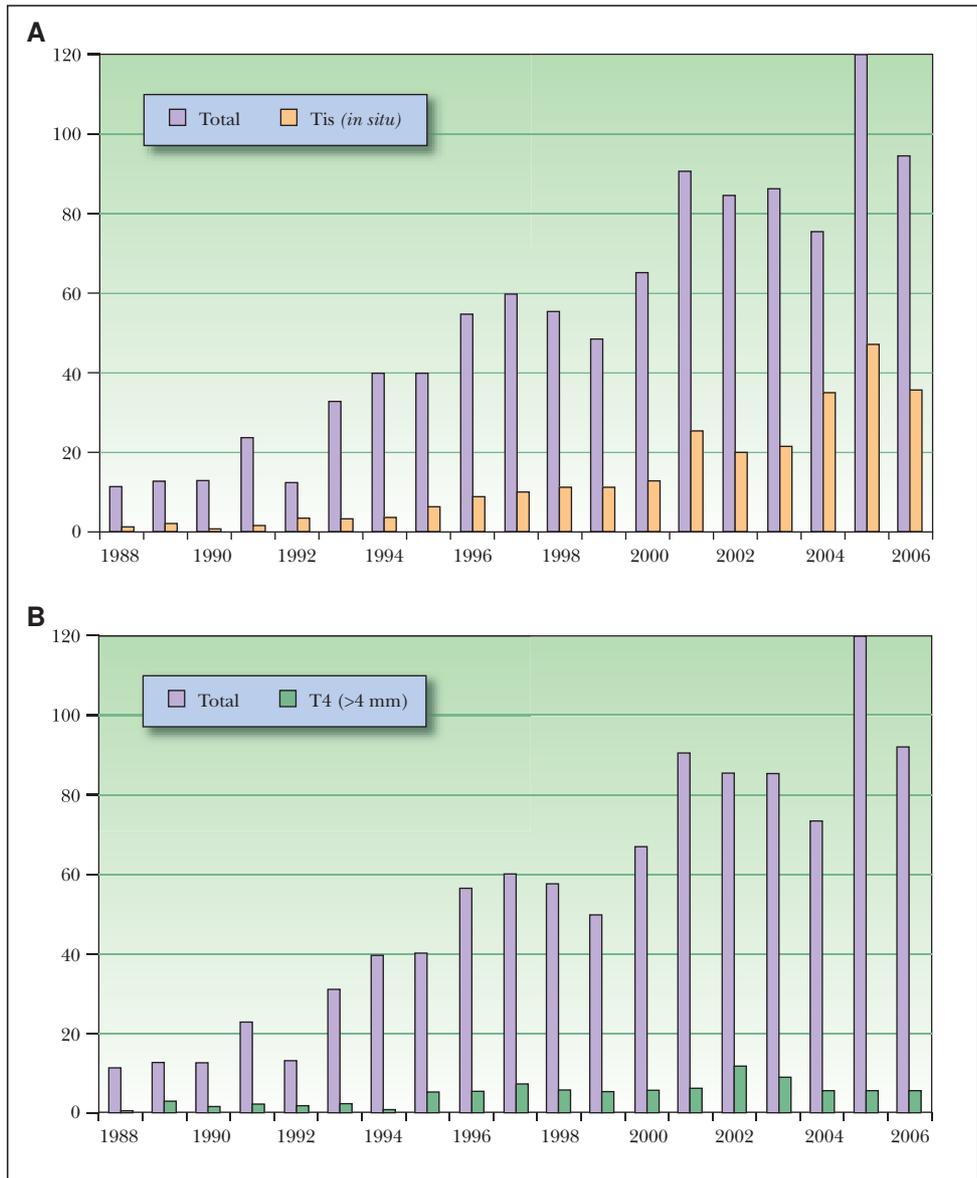


Figure 1. Change in the number of cases diagnosed per year and proportion of patients with in situ melanoma (A) and tumors over 4 mm (B)

studies of the overall Spanish population, data are available from cancer registries in some provinces that reveal a much lower incidence than in countries such as Australia and the United States. However, as has occurred in those countries, there has also been a rise in the incidence in Spain in recent years.³ Although the number of cases diagnosed each year in one health care centre could be affected by changes in patient referral and might not be considered evaluable from an epidemiologic perspective, the number of cases each year in our hospital has increased by a factor of 6 in 19 years, and incidence has continued to rise.

Some authors consider the increase in the incidence of cutaneous melanoma not to be a true phenomenon but to be due to the overdiagnosis of indolent cases.⁷ However, the increase in melanoma-related mortality and in the

incidence of thick primary tumors detected in some studies suggest that this increase in incidence is real.⁷ In our study, all cases were diagnosed by the same health care team over the 19-year period of the study, and the same histologic diagnostic criteria were maintained throughout the study period.

The increase in the incidence of cutaneous melanoma worldwide has not been associated with a proportional increase in mortality.³ Furthermore, some studies report that mortality due to malignant melanoma has stabilized in recent years and has stopped increasing.^{8,9} This is considered to be due to the progressive reduction in the thickness of the tumors thanks to the early diagnosis of melanoma.¹⁰ In a recent study performed in Italy, in situ melanoma accounted for 58.2% of all melanomas diagnosed

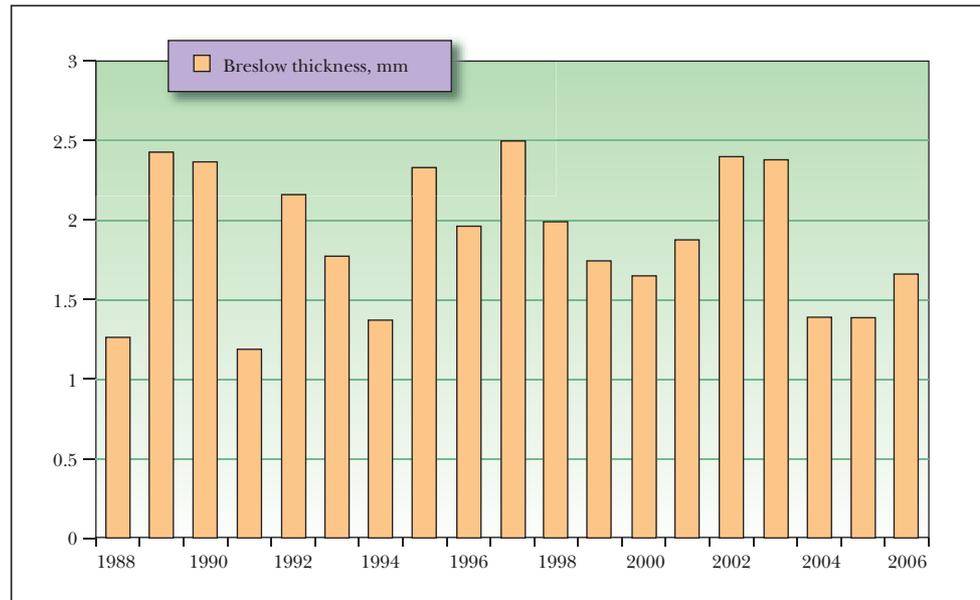


Figure 2. Change in the yearly mean maximum depth of invasion of the invasive melanomas (Breslow thickness)

between 2000 and 2004 in comparison with 50.7% of those diagnosed in the previous 4 years.⁶ The authors attribute this improvement in the diagnosis of early cases to the efforts made in recent years to raise awareness in the population and to the work of general practitioners and dermatologists. In addition, a number of studies in Spain comparing data from the 1980s with those from the 1990s have revealed a large increase in the number of early melanomas^{11,12}; this was attributed to the prevention campaigns that have been undertaken.^{3,13} Consistent with the findings of those studies, we observed a large increase in the number of in situ melanomas diagnosed in our hospital during the second half of the study period compared with the first half (from 36 cases between 1988 and 1997 to 224 cases between 1998 and 2006). However, the mean maximum depth of invasion did not vary over the 19 years studied. Furthermore, the proportion of melanomas with a depth of invasion greater than 4 mm also remained constant (9.60% of all melanomas in the first half of the study period and 8.56% in the second half), and their total number doubled (from 29 cases in the first half of the study period to 62 cases in the second half).

In the present study, those cases diagnosed earlier, at the stage of in situ melanoma, were mainly detected in female patients. Of the total of 260 patients with in situ melanoma, 174 were detected in women and 86 in men (female to male ratio of 2.02 to 1). On analyzing only the patients with invasive melanoma, there was a greater proportion of women among the 350 cases with a maximum depth of invasion less than 1 mm (215 women vs 135 men; female to male ratio of 1.59 to 1), with a mean age of 49.21 years. In contrast, there was a predominance of men among the 91 patients with melanomas presenting a maximum depth of

invasion greater than 4 mm (53 men vs 38 women), and the mean age was noticeably higher (63.60 years). As found in previous studies,¹⁴ these data suggest that prevention campaigns reach the young population more effectively, whereas older patients, particularly men, continue to seek medical attention with advanced primary tumors, and these have actually increased in absolute numbers.

Although some studies suggest that cutaneous melanoma-related mortality is beginning to decrease, the proportion of primary melanomas diagnosed in advanced stages in our population remained stable over the 19-year period studied. For this reason, we consider that it is necessary to continue insisting on campaigns for the prevention and early detection of cutaneous malignant melanoma, targeting particularly the elderly population.

Conflicts of Interest

The authors declare no conflicts of interest.

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