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ORIGINAL ARTICLES

Sociodemographic Characteristics of Spanish Skin Cancer Patients

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Abstract. *Introduction*. Most epidemiological studies of skin cancer have been performed in countries with very different population and geographic characteristics to Spain. Investigation of this disease in the Spanish population would therefore be of interest.
Method. Over a 12-month period, this prospective study recorded the types of skin cancer in consecutive patients who attended a dermatology clinic for the first time in health care area 3 of the health service of the Spanish autonomous community of Murcia. The demographic and social characteristics of these patients were determined. The results obtained were analyzed with the SPSS program, version 11.5, and compared with other studies conducted in other countries.
Results. Malignant tumors were the third most common presenting complaint (16.9%) and the fourth most common secondary complaint (8%). The patients with skin cancer were older (69.52 years; 95% confidence interval [CI], 67.82-71.21 years) than the other patients in the sample (34.52 years; 95% CI, 33.23-33.81 years), and there were more men (51.7%) than women (48.3%). These individuals had a low level of schooling, which varied according to the type of tumor, and most had outdoor jobs, with a significantly higher exposure to sunlight (3.35 h/d; 95% CI, 3.08-3.62 h/d) than the other patients (2.72 h/d; 95% CI, 2.58-2.86 h/d). Furthermore, fewer malignant cutaneous tumors were found in patients with a higher phototype. The length of time since onset of the presenting complaints was shorter for skin cancer (11.37 months; 95% CI, 7.47-15.26 months) than for other skin diseases (25.83 months; 95% CI, 22.87-28.80). Also, there were no seasonal peaks in consultations for skin cancer, and treatment was essentially based on surgery and cryotherapy. In addition, more of these patients had follow-up visits (84%) than other dermatology patients (33%).
Conclusions. Malignant or premalignant skin lesions are a common presenting skin complaint in the Mediterranean region, with differences in terms of attendance rates and predominant tumor type compared to other countries. This is probably due to the high sun exposure and predominance of skin phototype III. Similar studies for the whole of Spain would be of interest.

Key words: epidemiology, skin cancer, Spain.

CARACTERÍSTICAS SOCIODEMOGRÁFICAS DEL CÁNCER CUTÁNEO EN ESPAÑA

Resumen. *Introducción*. La mayoría de los estudios epidemiológicos acerca del cáncer cutáneo están realizados en países con características tanto poblacionales como geográficas muy diferentes a las españolas, por lo que resulta interesante conocer cómo aparecen estas lesiones en nuestra población.
Método. En este estudio se han descrito de manera prospectiva y durante un período de 12 meses consecutivos los tipos de cáncer cutáneo en los pacientes que acudieron por vez primera a la consulta de Dermatología en el área sanitaria 3 del Servicio Murciano de Salud y las características tanto demográficas como sociales de estos pacientes. Los resultados obtenidos se han analizado mediante el programa SPSS versión 11.5 y se han comparado con los de otros estudios llevados a cabo en otros países.
Resultados. Se ha encontrado que los tumores malignos constituyen el tercer motivo primario de consulta más frecuente (16,9 %) y el cuarto motivo secundario de consulta dermatológica (8 %). Los pacientes que acud-

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ieron por dicho motivo eran de mayor edad (69,52 años, intervalo de confianza de 95 % [IC 95 %]: 67,82-71,21) que el resto de los sujetos de la muestra (34,52 años, IC 95 %: 33,23-33,81), predominando los varones (51,7 %) frente a las mujeres (48,3 %). Estos individuos poseen un bajo nivel de estudios, que además varía según el tipo de tumor desarrollado, y sus trabajos se efectúan predominantemente al aire libre, con una fotoexposición significativamente más alta (3,35 h/d, IC 95 %: 3,08-3,62) que el resto de pacientes (2,72 h/d, IC 95 %: 2,58-2,86). Además, a medida que aumenta el fototipo disminuye la aparición de tumores malignos de piel. Las lesiones que motivan la consulta al dermatólogo tienen menor tiempo de evolución (11,37 meses, IC 95 %: 7,47-15,26) que la del resto de patología (25,83 meses, IC 95 %: 22,87-28,80), no presentan picos estacionales y el tratamiento que reciben se fundamenta en la cirugía y la crioterapia. Además, estos pacientes se revisan más (84 %) que el resto de pacientes dermatológicos (33 %).

Conclusiones. Las lesiones cutáneas malignas o premalignas constituyen un motivo frecuente de consulta dermatológica en el área mediterránea, con unas tasas de frecuentación y un predominio de tipo tumoral diferente al de otros países, probablemente debido al elevado índice de insolación y al fototipo III predominante. Resultaría interesante la realización de estudios similares a nivel nacional.

Palabras clave: epidemiología, cáncer cutáneo, España.

Introduction

Enormous advances have been made in the field of dermatology in recent decades thanks to clinical and epidemiological research efforts and the emergence of new diagnostic and therapeutic strategies. To effectively address the needs of practicing dermatologists in terms of organizing the time they allocate to patients and choosing the most appropriate diagnostic and therapeutic tools, it is first necessary to gather information on who is consulting dermatologists and why, and to identify the diagnostic and therapeutic tools required to meet their needs. Although epidemiological studies designed to answer such questions have been conducted in other countries,[1] they have become somewhat outdated and their findings cannot always be extrapolated to Spanish patients as they were conducted in non-Mediterranean populations, with different habits and phenotypes. It is therefore important to design projects aimed at identifying the true needs of the population in order to offer health care services tailored to the needs of users, optimize the utilization of available financial and human resources, design population-based prevention strategies, and set up specialized dermatology units.

Cancer has an enormous impact on both patients and the public health care system. The incidence of skin cancer and precancerous lesions is increasing annually, probably as a result of an ageing population, bad "sun habits" (obsessive tanning culture), and changes in the sun's radiation. We performed an epidemiological study of skin disorders, and skin cancer in particular, in a Spanish Mediterranean health care district in an attempt to remedy the lack of data in this field.

Materials and Methods

The study was performed in health care district III of the Spanish autonomous community of Murcia. The district includes the municipalities of Lorca, Águilas, Puerto Lumbreras, Totana, and Aledo, and serves a population of approximately 150 000 through the central hospital, Hospital Rafael Méndez, and a number of primary and specialized health care centers. The area takes in Mediterranean coastline, mountains, and farmland, and the climate is mainly dry and sunny. Twenty percent of the population are immigrants (from South America, Arab countries, and northern Europe) as the area is not only located in a prosperous agricultural zone but is also a popular tourist destination.

The health care district has 2 dermatologists, each of whom attends to the same number of patients in a similar set-up, meaning that both patient panels are representative of the general population attended to by the dermatology department. Data were gathered prospectively by the investigating dermatologist over a period of 12 months (March 2005 through February 2006) using a special questionnaire completed following each patient visit. Patients were included in the study if they were a first-time patient, if they had not seen another dermatologist about the same complaint in the past year, if they agreed to provide personal data, and if they verbally consented to their information being used anonymously for the purpose of this study. A total of 1180 patients fulfilled these criteria and were included in the study.

The following variables were recorded for each patient: visit details (date, waiting time from referral to visit, referring

physician, and type of referral); personal details and history (age, sex, level of education, job, skin phototype, history of exposure to sun, smoking history, comorbidity, and personal and family history of skin disorders); reasons for visit; treatment prescribed (topical or systemic, surgery, cryotherapy, others, or no treatment); and follow-up schedule. The reasons for visits were classified into general categories covering the most common reasons recorded for each group. These categories were inflammatory diseases, nevi, skin cancers, infections, acne, hair and nail disorders, esthetic consultations, autoimmune diseases, sexually transmitted diseases, and others.

When a patient visited the dermatologist with more than 1 complaint, the first 2 were recorded: that which prompted the patient to visit the dermatologist (presenting complaint) and the second complaint mentioned (secondary complaint). Although some of the secondary complaints required treatment, only the treatment prescribed for the presenting complaint was recorded. When a complaint required more than 1 type of treatment, the most aggressive treatment was recorded according to the following order: surgery > cryotherapy > systemic treatment > topical treatment > other treatments > no treatment.

Skin cancer was divided into the following categories: precancerous lesions (including actinic keratosis, cutaneous horns, Bowen disease, erythroplasia of Queyrat, leukoplasia, and Paget disease), basal cell carcinoma, squamous cell carcinoma (affecting skin or mucosa on any part of the body), melanoma, and other types of skin cancer (keratoacanthoma, cutaneous lymphomas, and Merkel cell carcinoma). The data were entered into a database and analyzed using version 11.5 of the SPSS statistical software package.

Results

Skin cancer was the presenting complaint for 16.9% (200/1180) of the study group and the third most common presenting complaint (after nevi and inflammatory disorders). For 7 patients, it was a secondary complaint, meaning that, in total, 17.5% of the patients who visited the dermatology department in our study had lesions with malignant potential.

The distribution of skin cancer type was as follows (shown as percentage of total skin cancers and of sample, respectively): basal cell carcinoma (41.5%, 7.3% [n=86]), precancerous lesions (36.7%, 6.4% [n=76]), squamous cell carcinoma (15.5%, 2.7% [n=32]), other types of skin cancer (4.3%, 0.8% [n=9]), and melanoma (1.9% and 0.3% [n=4]).

There were no significant differences between patients with skin cancer and those with other skin disorders in terms of the priority with which they were referred for specialist care (P=.167, χ^2). In the investigator's opinion,

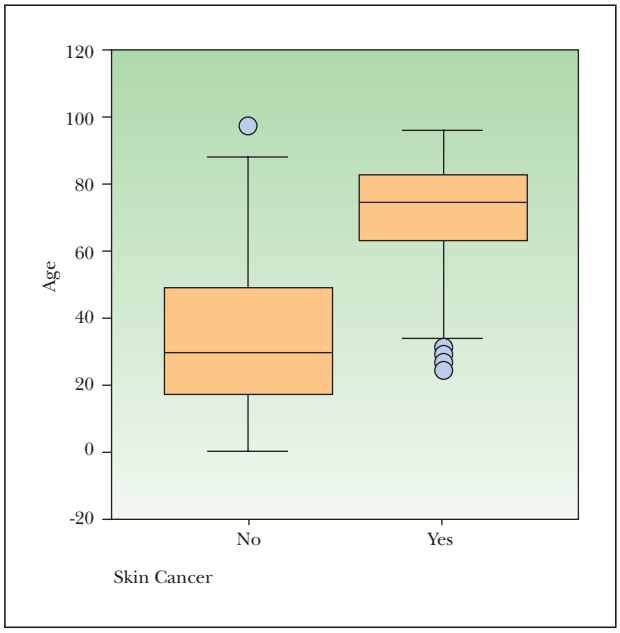

Figure 1. Box and whisker plot showing age distribution of patients with and without skin cancer.

however, more patients in the first group than in the second group should have been sent through the p15 system (patients who need to be seen by a specialist within 15 days) or the priority system (P<.001, χ^2).

The mean age of patients with skin cancer was higher than that of the rest of the group (P<.001, χ^2) (Figure 1). There were also age differences between the patients in the different skin cancer categories (Figure 2), although these were only statistically significant for melanoma (younger patients) versus squamous cell cancer (older patients) (P=.012, Mann–Whitney test). Had the number of patients with melanoma been larger, more statistically significant differences might have been found.

More men than women had skin cancer (51.7% vs 48.3%, respectively; P=.009, χ^2), and although women had more precancerous lesions and melanomas and fewer squamous cell cancers and other types of skin cancer than men, these differences were not statistically significant (P=.061, χ^2) (Figure 3).

The patients in the skin cancer group had a lower level of education than the rest of the group (P<.001, χ^2); 25.6% were illiterate and 46.6% had basic education only. Age, however, is a potential confounding variable as a lack of education is common in elderly individuals, many of whom would have been obliged to work in unskilled jobs, often in the sun, leading to the development of skin cancer.

We also found differences in level of education on analyzing the patients by skin cancer type (P<.05, P=.028, χ^2) (Figure 4). For example, there were more patients with secondary education in the precancerous lesion category than in the other categories. This might be due to both

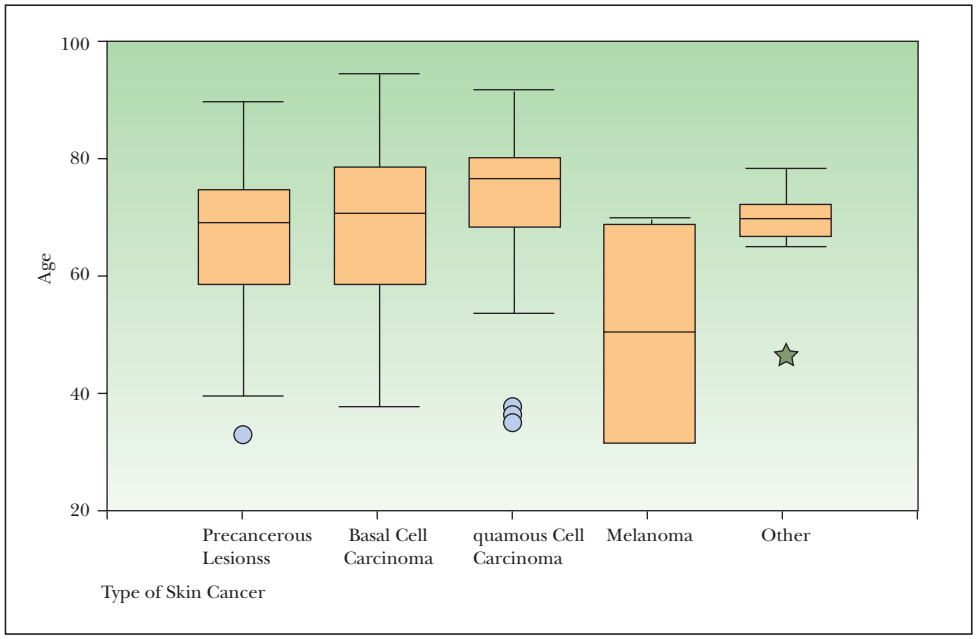

Figure 2. Box and whisker plot showing age distribution by type of skin cancer.

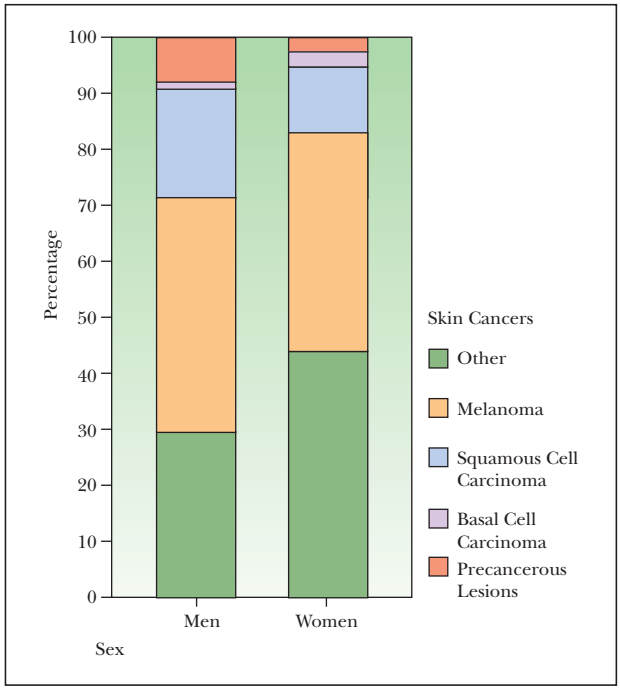

Figure 3. Type of skin cancer according to sex.

their younger age and their higher level of education (which would have led to jobs involving less exposure to the sun). Accordingly, we found that squamous cell carcinoma increased with decreasing levels of education.

In accordance with the above findings, we also found differences between the patients in the skin cancer group and the rest of the patients in terms of jobs performed ($P<.001$, χ^2). The former worked more outdoors, either full time or part time, and there were no patients in the "non-applicable" category (ie, there were no patients who had never worked because they were too young).

On analyzing patients by cancer type, we found no significant differences for type of job performed ($P>.05$, $P=.093$, χ^2), although squamous cell carcinoma was more common in patients who worked outdoors and precancerous lesions were more common in patients who worked indoors. Not only would level of education explain why more patients with precancerous lesions worked indoors but also why they sought medical advice regarding their lesions promptly.

More fair-skinned patients (with phototypes I and II) consulted the dermatologist about skin cancer than expected, and dark-skinned patients (with phototypes III and IV) had fewer skin cancers than their fair-skinned counterparts ($P<.001$, χ^2). In other words, the number of patients diagnosed with skin cancer decreased with an increase in skin phototype (Figure 5). When analyzed by cancer type, however, we found no significant differences for phototype ($P>.05$, $P=.619$, χ^2).

The patients in the skin cancer group had been subject to greater sun exposure than the rest of the group ($P<.001$, Mann–Whitney test), although differences in exposure levels were not significant when analyzed by cancer type ($P>.05$, $P=.3$, χ^2, Kruskall–Wallis) (Figure 6).

We found statistically significant differences for smoking between patients in the skin cancer group and the rest of the group ($P<.001$, $\chi 2$). The former contained more ex-smokers and nonsmokers, with no patients aged under 16 years, in whom questions were not asked regarding smoking. The fact that there were fewer current smokers in the group

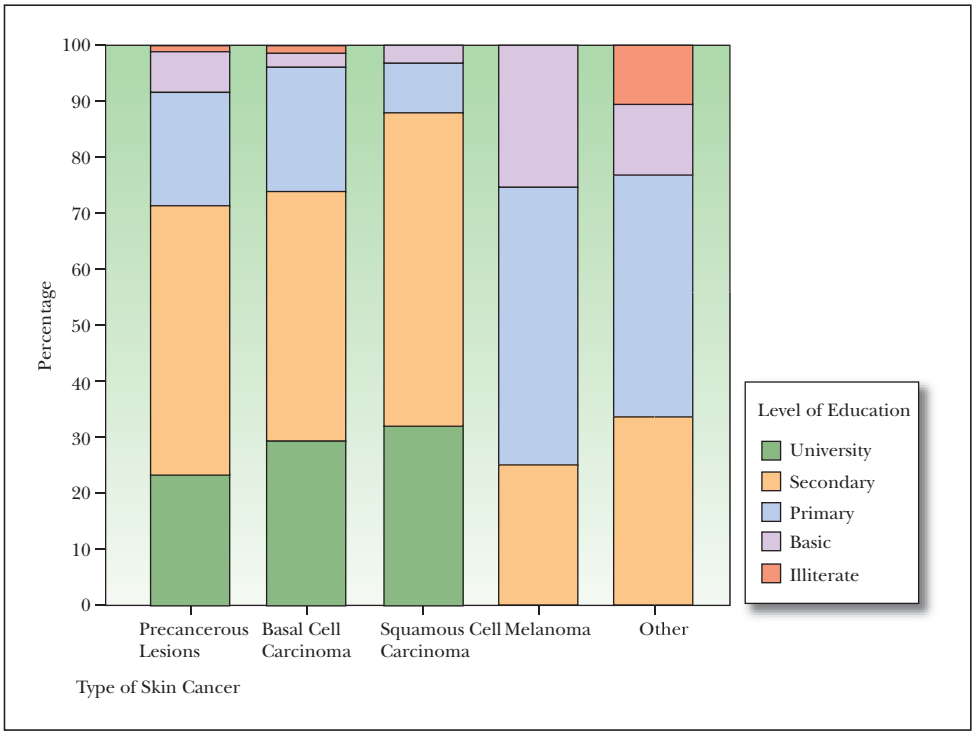

Figure 4. Type of skin cancer according to level of education.

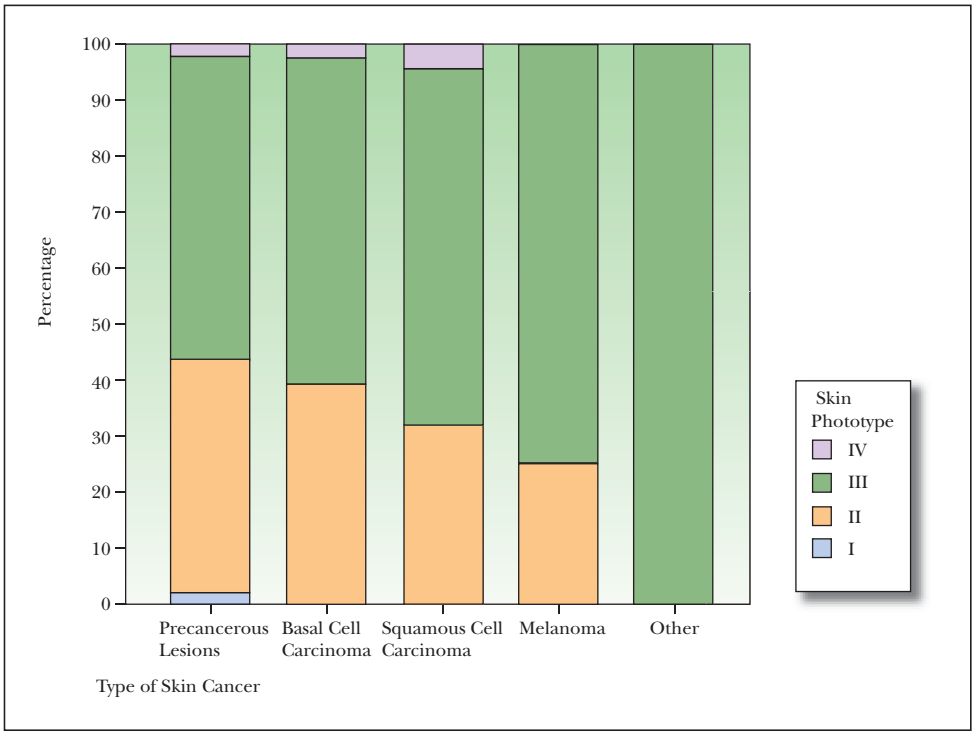

Figure 5. Type of skin cancer according to skin phototype.

of patients with skin cancer than in the rest of the group might be due to the fact that, on average, they were older (many might have already quit the habit and there were no patients aged under 16 years).

Patients with skin cancer also had a different personal history of skin disorders to the rest of the group ($P<.001$, χ^2). They had a history of more events (perhaps because they were, on average, older than the rest of the group) and

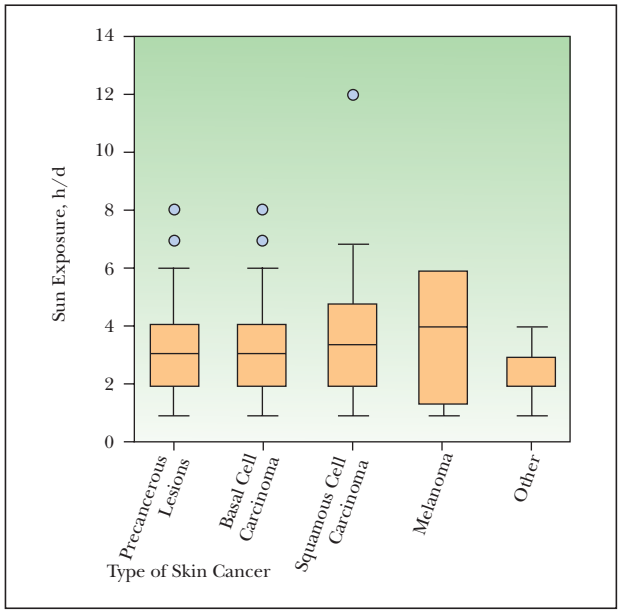

Figure 6. Box and whisker plot showing sun exposure and type of skin cancer.

they also had more non-melanoma skin cancers and precancerous lesions but fewer other skin disorders (such as inflammatory diseases). These findings are not surprising if we consider that advanced age, fair skin (low phototype), and frequent sun exposure are all risk factors for developing successive skin cancers.

We also found significant differences for personal history of skin disorders when we analyzed patients by cancer type. For example, a history of "other precancerous lesions" and "non-melanoma skin cancer" was more common in patients with precancerous lesions (precancerous lesions often precede the development of non-melanoma skin cancer), as was a history of non-melanoma skin cancer and precancerous lesions in patients with basal cell carcinoma, squamous cell carcinoma, and "other skin cancers" (for the same reason as mentioned above). Finally, a history of melanoma was more common in patients with melanoma, again to be expected considering the risk of recurrence associated with this type of cancer. Because the patients in this category were young, they did not have a history of skin disorders.

With a mean of 11.37 months (95% confidence interval [CI], 7.47-15.26; median, 5 months; range, 1-360 months), skin cancers had a shorter time since onset than other skin disorders, which had a mean of 25.83 months (95% CI, 22.87-28.8; median, 12 months; range, 0-600 months) (P<.001, Mann–Whitney test).

There were also differences in the mean time since onset between the different types of cancer diagnosed, with patients seeking medical advice fastest for melanoma and squamous cell carcinoma (5 months and 8.22 months, respectively). This is probably because squamous cell carcinoma is generally aggressive and the general population is increasingly aware of the implications of changes in pigmented lesions.

The treatments prescribed for skin cancers were also different to those prescribed for other skin disorders (P<.001, χ^2). All the patients with skin cancer, for example, received treatment; the most common treatments were surgery and cryotherapy and the least common, systemic therapy.

Treatment also varied according to cancer type (P<.001, χ^2). All the patients with melanoma and squamous cell cancer, for example, underwent surgery, compared to 95% of those with basal cell carcinoma, 85% of those with other types of cancer, and approximately 10% of those with precancerous lesions. Sixty-two percent of patients with precancerous lesions were treated with cryotherapy and 28% with topical treatment.

Follow-up visits were scheduled for more patients with skin cancer than for patients with other skin disorders (84% vs 33%) (P<.001, χ^2) and follow-up schedules also varied according to cancer type (P<.001, χ^2). While all the patients with cancerous lesions required periodic follow-up, only 45% of those with precancerous lesions did.

There were no seasonal peaks in terms of when the patients with skin cancer visited the dermatologist (P>.05, P=.738, χ^2), nor any statistically significant differences between skin cancer and other lesions for month of onset. Although three-quarters of the patients with melanoma visited the dermatologist in June and July—perhaps because changes in skin marks were more noticeable once they started wearing lighter summer clothing—the number of patients was so small that we were unable to find statistically significant differences.

Discussion

Skin cancer was the third most common presenting complaint (16.9% of all presenting complaints) among the dermatology patients in our series, surpassed only by nevi and inflammatory diseases. Our findings contrast with those for the United States, where non-melanoma cancer was found to be the sixth most common skin complaint.[2] The most common type of skin cancer detected in our series was basal cell carcinoma, followed by precancerous lesions, and at a greater distance, squamous cell carcinoma. Melanoma and other types of cancers were, fortunately, rarer. If we extrapolate our data to the general population, the incidence of skin cancer in Spain would be 115 new cases per 100 000 individuals per year. This is very similar to the figures estimated for both the United Kingdom (UK)[3] (138/100 000) and the USA (146/100 000) but very different to those for Germany (20/100 000) and Australia (726/100 000).[4] The moderate incidence for Spain can perhaps be explained by the fact that although people in the Mediterranean area are subject to chronic rather than intermittent sun exposure,

they tend to have a darker skin type than their northern European counterparts. The estimated incidence of squamous cell carcinoma in Spain, based on our findings, is 42.6 cases per 100 000 inhabitants per year, somewhat higher than the figure for the UK (35.8/100 000)[3] and considerably lower than that for the USA (256/100 000)[5] and Australia (250/100 000).[6] These findings are not surprising if we consider that cumulative UV light exposure (very high in the study area) is a risk factor for squamous cell carcinoma, while dark skin is a protective factor. The combination of both factors in the study area would explain why the estimated incidence of squamous cell carcinoma is higher than that in areas with low levels of sun exposure but lower than that in areas with similar levels of sun exposure but with a fairer-skinned population. Based on our data, the estimated incidence of melanoma in Spain is 5.33 cases per 100 000 inhabitants per year; this is considerably lower than the figure for the USA (10.4/100 000),[7,8] perhaps because the darker Mediterranean skin (phototypes III and IV) offers greater protection against melanoma than does fairer skin (phototypes I and II).

Patients in the skin cancer group were not referred from primary care any faster than those with other skin conditions. As already mentioned, the investigating dermatologist considered that patients with suspected skin cancer should have been given greater priority over other patients. These findings highlight the need to improve the referral criteria used in primary care settings to ensure that patients benefit from rapid diagnosis and treatment.

We did not detect any seasonal variations in terms of when patients with skin cancer decided to seek medical advice regarding their lesions. Although the majority of patients with melanoma visited the dermatologist at the beginning of summer, we were unable to detect any statistically significant differences between them and the other patients due to the small sample size. Because the mean time between onset of lesions and visit to the dermatologist was 5 months for the group of patients with melanoma, the lesions probably appeared or changed in appearance in late autumn or early winter, but the patients did not seek medical advice until the weather got warmer and they started to use lighter clothing.

The mean age of the patients with skin cancer was higher than that of the rest of the patients in our series; the youngest patients were in the melanoma category and the oldest in the squamous cell carcinoma category.

More men than women had skin cancer, probably because they do more outdoor work, but there were no significant differences in terms of numbers of men and women according to cancer type.

Patients with skin cancer had a lower level of education than the rest of the group (there was a high proportion of patients who were illiterate or had only basic education in this group). This is possibly because they had a higher mean age than the rest of the group but also because many of them worked outdoors.

Because more patients with skin cancer worked outdoors, either full time or part time, than the rest of the patients in the group, they would have been subject to greater sun exposure.[9]

We found that skin cancer was less common among dark-skinned patients (phototypes III and IV) than among fair-skinned patients (phototypes I and II) but that it was more common in the latter than expected. The fact that fewer skin cancers were detected in dark-skinned than in fair-skinned patients is consistent with risk factors proposed by other studies.[10,11] Our findings show that patients with fair skin, those who work outdoors, and those who are exposed to more sunlight develop more skin cancer than other patients, corroborating the findings of other authors.[10,11]

We also found differences between patients with skin cancer and the rest of the group in terms of smoking habits. Specifically, this group contained more ex-smokers and nonsmokers than the rest of the group. This is probably related to the advanced mean age of the patients in whom skin cancer was diagnosed (many of them would have already quit smoking and most of the women of this age would never have smoked in the first place). Many of the patients in the skin cancer group had a previous history of non-melanoma cancer and precancerous lesions; this is not surprising as the risk factors for skin cancer (high UV light exposure, advanced age, and fair skin) lead to the development of successive malignant lesions on different parts of the body.

The mean time since onset of skin cancer lesions was shorter than that of other skin conditions. This, again, is not surprising as, skin cancer lesions—particularly those in patients with melanoma or squamous cell carcinoma—are very noticeable and cause the patient to seek prompt medical advice.

As was to be expected, surgery and cryotherapy were the main treatments used for skin cancer and no patients were prescribed follow-up only. With the exception of several patients with precancerous lesions, all the patients diagnosed with skin cancer were scheduled for periodic follow-up visits.

In conclusion, the findings of this study of the epidemiological features of skin disorders, and skin cancer (precancerous and cancerous lesions) in particular, serve as an important tool for designing treatment, resource allocation, education, and prevention strategies for primary and specialist health care services in Spain. Considering that the patients eventually diagnosed with skin cancer in our series were not given priority when being referred for specialist care by non-dermatologists, training courses for primary care physicians in this area should be promoted. Although skin cancer lesions are, per se, a serious matter, it is particularly noteworthy that these lesions were also the third most common presenting dermatology complaint.

Also noteworthy is the fact that the corresponding visits occurred throughout the year (although more patients with melanoma visited their dermatologist when the weather got warmer and they started to use lighter clothing).

Our study has shown that skin cancer was more common in elderly patients than in younger patients and that the mean age of patients with skin cancer—and that of men in particular—was considerably higher than that of the other patients in the series. Sun exposure was a determinant of skin cancer development, explaining why this was more common in patients with a low level of education and in those who worked outdoors, either part time or full time. Another genetic factor we found to be associated with the development of skin cancer was skin phototype but the association was inverse, ie, the lower the phototype, the higher the incidence of skin cancer. Smoking does not appear to be related to the development of skin cancer as there were more nonsmokers and ex-smokers in the skin cancer group than in the rest of the group.

Finally, surgery, followed by cryotherapy, topical treatment, and other types of treatment such as radiotherapy, was the most common treatment used for skin cancer.

In conclusion, both cancerous and precancerous lesions are a serious public health care problem in the Mediterranean due to their high prevalence, which is probably related to a combination of high sun exposure levels and a progressive ageing of the population. It would be interesting to create dermatology units specialized in prevention, diagnosis, and treatment of this condition and to increase awareness among both primary care physicians and the general population.

Conflicts of Interest

The authors declare no conflicts of interest.

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