

Isabel RODRIGUEZ-BLANCO^{1,9,a}
Ángeles FLOREZ^{2,a}
Carmen PAREDES-SUÁREZ³
Romina RODRÍGUEZ-LOJO⁴
Daniel GONZÁLEZ-VILAS⁵
Aquilina RAMÍREZ-SANTOS⁶
Sabela PARADELA⁷
Ignacio SUÁREZ CONDE⁸
Manuel PEREIRO-FERREIRÓS⁹

¹ Department of Dermatology, University Hospital of Santiago de Compostela, Spain

² Department of Dermatology, University Hospital of Pontevedra, Spain

³ Department of Dermatology, Hospital Virxe da Xunqueira, University Hospital of La Coruña, Spain

⁴ Department of Dermatology, University Hospital Lucus Augusti, Spain

⁵ Department of Dermatology, University Hospital of Vigo, Spain

⁶ Department of Dermatology, Hospital el Bierzo, Spain

⁷ Department of Dermatology, University Hospital of La Coruña, Spain

⁸ Department of Dermatology, University Hospital of Ourense, Spain

⁹ Department of Dermatology, University of Santiago de Compostela, Spain

^a These authors contributed equally

Use of lip photoprotection in patients suffering from actinic cheilitis

Background: Actinic cheilitis (AC) is a chronic condition that affects mainly the lower lip. **Objectives:** To investigate the use of lip photoprotection in patients with AC. **Materials and Methods:** A cross-sectional multicentre study of patients, ≥ 45 years of age, was performed in eight dermatology departments in the Galicia region over a period of one year. From 1,239 patients included in the study, 410 were diagnosed with AC and complete data were available for 408. An analysis of lip photoprotection habits and possible associations in patients with AC is reported. **Results:** Mean age of patients with AC was 71.9 years and 53.8% were women. More than 90% of AC patients (370/408) had never used lip photoprotection. In the group of patients who used it, 62.16% of them had only used a single stick within the previous year. The only variable significantly associated with the use of lip sun protection was low Fitzpatrick's skin types I and II ($p=0.039$). Study limitations include the inclusion of patients 45 years or older and the use of a semiquantitative scale for measuring the frequency of application of lip photoprotection. **Conclusion:** To our knowledge, this is the first European study focused on lip photoprotection in patients suffering from AC. Only a minority of AC patients protect their lips from UV radiation. Specific lip sun protection recommendations should be promoted, especially in high-risk populations.

Key words: actinic cheilitis, epidemiology, photoprotection, prevalence

Reprints: I. Rodriguez-Blanco
<sabebianco@gmail.com>

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Actinic cheilitis (AC) is a clinical condition that affects mainly the lower lip of patients who have been chronically exposed to ultraviolet radiation. AC is considered a potentially malignant oral lesion [1] or even a superficial squamous cell carcinoma (SCC) [2-4], but the rate of progression from AC to invasive SCC has not been established. Moreover, the lip has been considered a high-risk location for SCC. Adequate photoprotection should be the first and most important measure to prevent AC [5-10]. Little attention has been paid in the past to sun protection habits focused on the lips and only few studies have investigated this issue.

An epidemiological study was previously conducted by our group to determine the prevalence of AC and its associated variables [11]; lip photoprotection was specifically investigated in the subpopulation suffering from AC as well as its possible associations with demographic or clinical variables and sun exposure habits.

Patients and methods

A cross-sectional multicentre study was conducted in Galicia (total population in 2016: 2,718,525, based on data from the Galician Statistics Institute; <http://www.ige.eu>),

a region located in north-west Spain. Eight dermatology departments participated in the study and patients were prospectively collected from January 12, 2016 to January 31, 2017. Consecutive patients, ≥ 45 years of age, attending a general dermatology outpatient clinic were recruited once a week. AC was defined by the presence of one or several of the following items (modified from Ribeiro *et al.* [12]): persistent desquamation, persistent erythema, mottled appearance (erythema and white patches), plaques (solid, raised, flat lesion > 1 cm), and/or erosion/ulceration that could not be attributed to other dermatological disorders [11]. Demographic and medical variables investigated for correlation with lip photoprotection were sex, age, previous history of skin cancer, working outdoors, and Fitzpatrick's phototype. A semiquantitative scale was used for measuring the use of lip photoprotection based on four levels: always, almost always, sometimes, and never. The number of lip sun protection sticks used in the previous 12 months was also registered.

A descriptive analysis was performed for all the collected variables. Categorical variables were presented as a list of frequencies and proportions. For quantitative variables (continuous or ordinal), central tendency estimators such as mean, median and mode, and dispersion measures (standard deviation and maximum-minimum values) were calculated. A chi-square test was used to compare the population who

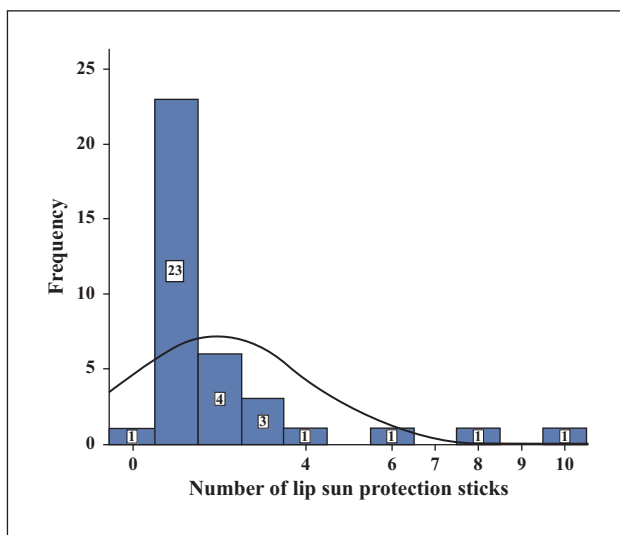


Figure 1. Number of lip sun protection sticks used in the previous year among AC patients.

never used lip photoprotection versus the population who used it. A significance level of 5% was set.

The study protocol was approved by the Research Ethics Committee of Pontevedra-Vigo-Ourense, Spain; protocol number: 2015/582.

All statistical analyses were performed using SPSS 22.0 statistical software for Windows.

Results

A total of 1,250 patients were selected for the study, 11 of whom did not accept to participate or were not willing to sign the consent form, thus finally a total of 1,239 patients were included. Out of these 1,239 patients, 410 were diagnosed with AC and complete data were available for 408 patients. The prevalence of AC in the study population was found to be 31.3% (95% confidence interval [CI]: 28.7-33.8).

Regarding lip sun protection habits in the population with AC, only 9.3% reported the use of photoprotection, whereas 90.7% of the patients reported they had never used it. Among those who effectively used lip sun protection, 68.4% were women; the proportions of patients who sometimes, almost always, and always used a lip sunscreen were 6.1%, 2.2% and 1%, respectively. The number of lip sunscreen sticks used in the previous year is shown in *figure 1*. The majority of patients (62.1%) had used only one stick.

The analysis of the characteristics of the patients who never used lip photoprotection versus those who used it is shown in *table 1*. A statistically significant correlation between the use of lip sunscreen and Fitzpatrick's phototypes I and II ($p=0.039$) was observed. More women than men used lip photoprotection, but the difference was not significant ($p=0.090$). The rest of the variables analysed (age, working outdoors for more than 25 years, and previous non-melanoma skin cancer [NMSC]) did not show any significant association.

Discussion

The anatomical upright position of the lower lip makes it susceptible to receive a high level of UV radiation, favouring the development of AC that could eventually progress to invasive SCC. The role of lip photoprotection in decreasing the risk of lip cancer was shown in a study performed with Californian women; those who infrequently applied lip protection (no more than once a day) had twice the risk compared to women who used lip protection more often [13]. Despite this evidence, photoprotection promotion strategies specifically directed to lips are scarce [5, 14, 15]. Our study is consistent with this, as only 9.3% of the AC patients had ever used lip photoprotection.

Lip UV protection has been poorly analysed; there are only few heterogeneous studies regarding this issue and they were mainly performed in specific populations. An analysis of these and a comparison with our data is presented herein. The only variable significantly related to photoprotection in our study was skin Fitzpatrick phototypes I and II. This finding is in contrast to a survey of 299 beachgoers in Texas concerning skin and specific lip photoprotection; in this study, subjects with Fitzpatrick's phototypes I to III were more likely to use sunscreen for UV skin protection than subjects with types IV to VI, but the use of lip protection was not greater for phototypes I to III [16]. It could be hypothesized that in our study, the most photosensitive patients (Fitzpatrick's phototypes I and II) would be more conscious of the possible harm from the sun and would have increased the use of lip photoprotection. Regarding sex distribution, the same study observed that the use of a lip sunscreen stick was significantly higher in women compared with men [16]. Even though more women than men reported the use of lip UV protection in our study, the difference was not statistically significant. Working outdoors for more than 25 years was not related to a greater use of lip photoprotection, meaning that, probably, this specific high-risk population is not aware of the harmful potential of cumulative UV radiation on the lip. In contrast to our study, Lucena *et al.* found in a population of beach workers in north-eastern Brazil that the only factor related to the use of any photoprotection (not only lip but also skin-directed) was working outdoors. The proportion of workers who reported the use of a lip sunscreen was 14% [17], slightly higher than the 9.3% observed in our study. A comparative use of lip photoprotection was also made in our study between those patients who had been diagnosed in the past with NMSC and those who had not. Surprisingly, patients with a previous NMSC, who should have received proper photoprotection advice from their respective dermatologists, were not more prone to specifically protecting their lips. It is worth mentioning a study that investigated compliance with sunscreen advice in 4,837 adult skiers and snowboarders in high-altitude skiing areas [18]. Complete compliance with photoprotection measures was low (4.4% of the responders), but was higher among those who also used a sunscreen lip balm, reflecting a small group of individuals who were aware of the complete sun protection protocol including not only skin, but also lip photoprotection.

In order to examine the data regarding lip UV protection in patients suffering from AC, we reviewed published AC prevalence studies; in addition to the aforementioned study of Lucena *et al.* [8, 17], only a few studies collected data

Table 1. Correlation between the use of lip photoprotection and different clinical and demographic variables among AC patients.

Variable		Lip photoprotection					p*
		Never n (%)	Sometimes n (%)	Almost always n (%)	Always n (%)	Total n (%)	
Sex	Female	200 (88.5%)	18 (8%)	7 (3.1%)	1 (0.4%)	226 (100%)	0.09
	Male	170 (93.4%)	7 (3.8%)	2 (1.1%)	3 (1.6%)	182 (100%)	
Age group	45-65 years	92 (86.8%)	11 (10.4%)	2 (1.9%)	1 (0.9%)	106 (100%)	0.121
	> 65 years	278 (92.1%)	14 (4.6%)	7 (2.3%)	3 (1%)	302 (100%)	
Fitzpatrick skin type I-II	No (>II)	205 (93.6%)	10 (4.6%)	3 (1.4%)	1 (0.5%)	219 (100%)	0.039
	Yes (I-II)	165 (87.3%)	15 (7.9%)	6 (3.2%)	3 (1.6%)	189 (100%)	
Working outdoors > 25 years	No	99 (89.2%)	9 (8.1%)	2 (1.8%)	1 (0.9%)	111 (100%)	0.567
	Yes	271 (91.2%)	16 (5.4%)	7 (2.4%)	3 (1%)	297 (100%)	
Previous non-melanoma skin cancer	No	299 (90.6%)	22 (6.7%)	6 (1.8%)	3 (0.9%)	330 (100%)	1.000
	Yes	71 (91%)	3 (3.8%)	3 (3.8%)	1 (1.3%)	78 (100%)	

regarding lip photoprotection. Silva *et al.* investigated the prevalence of lip diseases in fishermen from Santa Catarina island and they found no association between the use of general sun protection and prevalence of AC, but they reported a statistically significant correlation between the use of sunscreen (not specifically lipstick) and a lower prevalence of AC [19]. A prevalence study of AC in farmers carried out in northeast Brazil showed that the habit of using a cloth over the face and sunscreen was associated with a lower number of cases of AC [20]. Another study also conducted in Brazil found a significant correlation between the non-use of sunscreens and the development of AC in a population of fishermen and woman [12].

The present study has some limitations; only patients of 45 years or older were selected for the study. There is agreement that most cases present in people over 50 years [8, 12], however, the inclusion of only older patients excludes younger patients with AC. Another limitation could be the use of a semiquantitative scale for calculating the frequency of lip photoprotection. In order to have a more accurate measurement, the number of sticks of lip photoprotection used in the previous year was also addressed.

Conclusion

We present the first European multicentre study analysing lip photoprotection habits in a population with AC. Only 9.3% of the AC patients had ever used lip photoprotection in the previous year and most of them had only used one stick. Having a low phototype (Fitzpatrick's phototypes I and II) was the only variable related to the use of lip photoprotection. Surprisingly, patients working outdoors or those with a previous NMSC did not show appropriate lip sun protection habits.

Our results highlight the need to intensify educational and preventive measures to implement the correct use of lip photoprotection in the general population and especially in high-risk populations. As dermatologists, we should encourage our patients not only to protect their skin, but also to protect their lips from UV radiation. ■

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