ORIGINAL ARTICLE

SUN EXPOSURE AND OCCUPATIONAL RISK: RELATIONSHIP AMONG SQUAMOUS CELL CARCINOMA OF THE LIP, ACTINIC CHEILITIS AND ORAL EPITHELIAL DYSPLASIA IN MILITARY AND THEIR RELATIVES

EXPOSIÇÃO SOLAR E RISCO OCUPACIONAL: RELAÇÃO ENTRE CARCINOMA DE CÉLULAS ESCAMOSAS EM LÁBIO, QUEILITE ACTÍNICA E DISPLASIA EPITELIAL ORAL EM MILITARES E DEPENDENTES

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ABSTRACT

Military personnel are considered an occupational risk group for the development of actinic cheilitis (AC) and lip squamous cell carcinoma (LSCC), due to the performance of duties outdoors under constant exposure to ultraviolet (UV) solar rays, which is the main risk factor for these diseases. This study aims to evaluate the relationship between AC and LSCC, associating the presence and degree of severity of oral epithelial dysplasia (OED) with the occupational factor in military personnel and dependents, evaluating the flow of referrals to the Stomatology Clinic of Odontoclínica Central da Marinha (OCM). A retrospective study was carried out on cases of AC or LSCC diagnosed between 2011 and 2023 in the OCM and the variables collected were: sociodemographic, occupational, history of sun exposure, military activity, affected anatomical area, presence and degree of OED, origin of the forwarding. The sample consisted of 89 (91.8%) cases of AC and 8 (8.2%) LSCC. The military personnel represented 83.1% of the AC cases and 75% of LSCC. As for origin, 83.1% of the AC and 62.5% of LSCC came from internal referrals, from the Military Organization itself. OED was present in 72% of the AC, with no statistically significant association between occupational exposure and the presence and severity of OED. Two cases of LSCC had reports of previous AC. This study corroborates data from the literature and demonstrates the importance of military dentists in preventing and treating oral diseases with occupational risk in the Armed Forces.

Keywords: Actinic cheilitis; Lip carcinoma; Oral dysplasia;. Military Personnel;· UV radiation.

RESUMO

Os militares são considerados um grupo de risco ocupacional para o desenvolvimento de queilite actínica (QA) e carcinoma de células escamosas de lábio (CCEL), devido ao desempenho de funções ao ar livre sob constante exposição aos raios solares ultravioleta (UV), sendo este o principal fator de risco destas doenças. Este trabalho tem como objetivo avaliar a relação entre QA e CCEL, associando a presença e o grau de gravidade da displasia epitelial oral (DEO) com o fator ocupacional em militares e dependentes, avaliar o fluxo de encaminhamentos para a Clínica de Estomatologia da Odontoclínica Central da Marinha (OCM). Foi realizado um estudo retrospectivo dos casos de QA ou CCEL diagnosticados no período de 2011 a 2023 na OCM e as variáveis coletadas foram: sociodemográficas, ocupacionais, histórico de exposição solar, atividade militar, área anatômica acometida, presença e grau de DEO. A amostra foi composta por 89 (91,8%) casos de QA e 8 (8,2%) CCEL. Os militares representavam 83,1% dos casos de QA e 75% dos CCEL. Quanto à origem, 83,1% das QA e 62,5% dos CCEL procederam de encaminhamentos internos, da própria Organização Militar (OM). A DEO esteve presente em 72% das QA, não sendo observada associação estatisticamente significativa entre a exposição ocupacional com a presença e gravidade da DEO. Dois casos de CCEL tinham relato de QA prévia. Este estudo corrobora com os dados da literatura e demonstra a importância do Cirurgião-Dentista militar na prevenção e tratamento das doenças orais com risco ocupacional nas Forças Armadas.

Palavras-chave: Queilite; Câncer labial; Displasia epitelial oral; Atividades militares; Radiação solar.

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INTRODUCTION

Oral cancer is a significant public health challenge on a global scale (1–5). In Brazil, according to estimates by the National Cancer Institute, 15,100 new cases of oral cancer are expected a year between 2023 and 2025 (6). Squamous cell carcinoma (SCC) is responsible for approximately 90% of malignant neoplasms of the mouth, with the majority of these cases being preceded by oral potentially malignant disorders (PMD) (6,7).

Particularly, lip cancer represents a significant proportion, comprising around 25 to 30% of oral cancer cases, with 95% of lip cancers being preceded by actinic cheilitis (AC) (6–8).

AC is a PMD of lip vermilion, which mainly affects the lower lip (9–13). Its main risk factor is chronic and progressive exposure to the sun's ultraviolet (UV) rays (10,14,15). Additional factors such as fair skin, advanced age, geographical latitude, male gender, smoking, genetic predisposition, immunosuppression, occupation, and leisure activities with intense sun exposure can also predispose to its development (12,14,16).

Occupational exposure to UV radiation, added to Brazil's geographical latitude, emerges as an important risk factor for developing AC and SCC in the Brazilian population, including the military (4,7,13,16–21). Frequent outdoor activities, such as military activities, physical-military training, standing to attention, boat repairs, and direct exposure to the sun during flight, highlight the military as an occupational risk group, making AC a disease that requires special attention from stomatologists in the Military Forces (17,19,21–23).

The main clinical features of AC include variations in lip color, loss of the boundary between the lip vermilion and the skin, presence of areas of atrophy, crusts, fissures, leukoplakic patches or plaques, erythema and ulcerations on the lip vermilion (7,8,10,24). Histopathologically, it may show stratified squamous epithelium with hyperkeratosis, acanthosis, or atrophy and varying degrees of oral epithelial dysplasia (OED), while the underlying connective tissue usually shows an amorphous basophilic zone called solar elastosis (7,9–11,25,26).

OED can be classified as mild, moderate, or severe, according to the World Health Organization (WHO) criteria. The clinical characteristics and the severity gradation of OED are considered a predictive factor of AC prognosis (27). This study aims to evaluate the relationship between AC and CCEL, associating the presence and degree of severity of OED with the occupational factor in military personnel and dependents of the Navy health system (family members), as well as to map the flow of referrals of these patients to the Stomatology Clinic of the Odontoclínica Central da Marinha (OCM - Navy's Central Dental Clinic), in Rio de Janeiro, Brazil.

MATERIAL AND METHODS

This study was approved by the Research Ethics Committee of the Marcílio Dias Naval Hospital (HNMD) under the number 76263423.8.0000.5256. It is an observational, longitudinal, and retrospective study. The sample was selected by searching the medical records, anatomopathological reports, and photographic records of the OCM Stomatology Clinic for patients with lesions clinically and histopathologically diagnosed as AC or SCC between 2011 and 2023. All cases without a pathological diagnosis were excluded from the final sample.

The following sociodemographic, occupational, and clinical information was collected: sex, age, skin color, rank (officer or enlisted), cadre (navy, marine force, health division, and auxiliary division), outdoor sports practice, affected anatomical area, presence, and degree of OED.

The investigation into the origin of the participants' referrals to the OCM Stomatology Clinic was carried out according to the following criteria: OCM clinics - dentists from other specialties - or external (extra-OCM) - carried out by health professionals (doctors or dentists) from another sector of the Navy Health System (health division of military organizations; Polyclinics or Marcílio Dias Naval Hospital) or from civilian dentists.

Smoking and drinking habits were considered when there was a report of their frequency or eventuality.

Military occupational risk was assessed according to the following functional categorizations: without military occupational risk (relatives of military personnel) (28); or with military occupational risk (active military personnel or veterans).

For the classification of AC, we subdivided the sample into two groups: the first group consisted of reports with a diagnosis of AC without epithelial dysplasia or with mild epithelial dysplasia, and the second group contained reports with a diagnosis of AC with moderate epithelial dysplasia or severe epithelial dysplasia (29).

All the histopathological information obtained was recorded in a Microsoft Office Excel 2010 spreadsheet (Remond, Washington, USA), prepared for this study. A descriptive and inferential analysis was carried out using the statistical program Statistical Package for the Social Sciences (IBM® SPSS Statistics, version 20.0).

The qualitative variables were presented as percentage frequency and absolute frequency [(n)%]. The following test was used to compare the groups

studied Chi-test or Fisher's exact test was used. The significance level established was 5% ($p \leq 0.05$).

RESULTS

From a total of 144 medical records selected, 47 cases of AC diagnosed only clinically were excluded because they did not have a pathological report. As a result, the final sample consisted of 97 cases [89 (91.8%) with a diagnosis of AC and 8 (8.2%) with a diagnosis of SCC].

Evaluation of AC cases

Table 1 describes AC's sociodemographic data. The sample comprised 89 cases, 76 (85.4%) men and 13 (14.6%) women. The age range was 36 to 72, with an average age of 60 (±11.0) years. Most of the individuals were white (n=76/85.4%), drinkers (n=47/52.8%), and non-smokers (n=69/77.5%).

All the patients had AC on the lower lip and only one case was on both lips.

TABLE 1. SOCIODEMOGRAPHIC DATA ON ACTINIC CHEILITIS

ACTINIC CHEILITIS	Total (n=89)	
	n	%
Sex		
Male	76	85.4%
Female	13	14.6%
Age		
<50 years	15	16.9%
≥50 years	74	83.1%
Skin color		
White	76	85.4%
Brown	10	11.2%
Black	2	2.2%
No information	1	1.1%
Smoking		
Yes	2	2.2%
No	69	77.5%
Ex-smoker	18	20.2%
Alcoholic		
Yes	47	52.8%
No	35	39.3%
Former alcoholic	7	7.9%
Smoking + Drinking		
Yes	16	18.0%
No	73	82.0%

OED was present in 64 (72%) lesions, 42 (47.2%) with mild OED, 15 (16.9%) with moderate OED and 7 (7.9%) with severe OED (Table 2).

When analyzing the flow of referrals to the OCM Stomatology Clinic, we observed that most (n=74/83.1%) of patients come from internal referrals from OCM clinics (Table 2).

Military personnel made up the majority of the sample (n=74/83.1%), with 61 (68.5%) veterans and 55 (74.3%) soldiers. The most affected militaries were from Navy personnel, with 47 (63.5%) patients, and from Marine Force, with 22 (29.7%) (Table 2).

When evaluating the occupational exposure factor, it was observed that 65 (73.0%) military patients performed only military occupational activity outdoors, and 9 (10.1%) patients performed both military and civilian work with prolonged sun exposure.

Only 22 (24.7%) patients who did outdoor sports reported leisure activities with sun exposure (Table 2). The occupational exposure variable associated with sports practice was present in only 15 (16.9%) cases.

Regarding the association between the origin of the referral and the degree of OED, we found that among the patients coming from other OCM clinics, most did not have OED or had mild OED (n=21/74; 28.4% and n=38/74; 51.4%, respectively). A statistically significant association was found between the low severity of OED (absence of OED/mild OED) and the OCM sector of origin (Table 2).

In terms of occupational status, the majority of participants had a diagnosis of low severity of OED (no OED/mild OED), with 76.9% (n=10/13) in active service, 73.8% (n=45/61) veterans and 80.0% (n=12/15) dependents. However, no statistically significant association was found between occupational status and the presence and severity of OED (Table 2).

Although military personnel accounted for 86.4% (n=19/22) of those with a diagnosis of greater severity (moderate/severe OED), there was no statistically significant association between occupational exposure and the presence and severity of OED (Table 2).

The majority of participants who did not practice outdoor sports (n=47/62;75.8%) had low severity of OED (no OED/mild OED). However, there was no statistically significant association between practicing outdoor sports and the presence and severity of OED (Table 2), nor was there an association between occupational exposure due to practicing sports and the presence and severity of OED.

The analysis according to the rank showed that the majority of enlisted (n=40/55;72.7%), as well as the majority of officers (n=15/19;78.9%), had a

TABLE 2. DISTRIBUTION OF OCCUPATIONAL DATA BY DIAGNOSIS OF ORAL EPITHELIAL DYSPLASIA

	No OED (n=25/28.0%)		With OED (n=64/72.0%)								
			Mild (n=42/42.2%)		Moderate (n=15/16.9%)		Severe (n=7/7.9%)		Total		p
	n	%	n	%	n	%	n	%	n	%	
Origin											0.038§
OCM	21	23.6%	38	42.7%	11	12.4%	4	4.5%	74	83.1%	
Extra-OCM	3	3.4%	4	4.5%	4	4.5%	3	3.4%	14	15.7%	
No information	1	1.1%	0	0.0%	0	0.0%	0	0.0%	1	1.1%	
Situation											0.872¥
Active	3	3.4%	7	7.9%	3	3.4%	0	0.0%	13	14.6%	
Veteran	18	20.2%	27	30.3%	10	11.2%	6	6.7%	61	68.5%	
Military relative	4	4.5%	8	9.0%	2	2.2%	1	1.1%	15	16.9%	
Occupational exposure											0.754§
Military	21	23.6%	34	38.2%	13	14.6%	6	6.7%	74	83.1%	
Military relative	4	4.5%	8	9.0%	2	2.2%	1	1.1%	15	16.9%	
Outdoor sports/leisure											0.574§
Yes	7	7.9%	8	9.0%	7	7.9%	0	0.0%	22	24.7%	
No	17	19.1%	30	33.7%	8	9.0%	7	7.9%	62	69.7%	
No information	1	1.1%	4	4.5%	0	0.0%	0	0.0%	5	5.6%	
Occupational exposure + Sport											0.204§
Yes	4	4.5%	5	5.6%	6	6.7%	0	0.0%	15	16.9%	
No	20	22.5%	33	37.1%	9	10.1%	7	7.9%	69	77.5%	
No information	1	1.1%	4	4.5%	0	0.0%	0	0.0%	5	5.6%	
Military Rank											0.764§
Enlisted	11	14.9%	29	39.2%	11	14.9%	4	5.4%	55	74.3%	
Officer	10	13.5%	5	6.8%	2	2.7%	2	2.7%	19	25.7%	
Division											0.570¥
Navy	14	18.9%	22	29.7%	8	10.8%	3	4.1%	47	63.5%	
Marine Force	4	5.4%	11	14,9%	5	6.8%	2	2.7%	22	29.7%	
Health division	0	0.0%	1	1.4%	0	0.0%	0	0.0%	1	1.4%	
Auxiliary division	1	1.4%	1	1.4%	1	1.4%	1	1.4%	4	5.4%	

Post/gradation and grade were calculated on the basis of 74 participants. ¥ Chi-square test; §Fisher's exact test.

low severity of OED (no OED/mild OED). However, no statistically significant association was found between officer and enlisted and the presence and severity of OED (Table 2).

Considering the functional category, the Auxiliary division (n=2/4;50.0%) was the group of patients with the highest OED severity rates (moderate OED/severe OED), followed by the Marine Force (n=7/22;31.8%) and the Navy (n=11/47;23.4%). However, there was no statistically significant association between functional status and the presence and severity of OED (Table 2).

Evaluation of lip squamous cell carcinoma cases

Table 3 describes the sociodemographic data of the participants with SCC. The sample consisted of 8 participants, 6 (75.0%) men and 2 (25.0%) women.

The age range was 29 to 78, with an average age of 62.6 (±15.1) years. All the individuals were white (100.0%) and drinkers (100.0%).

The majority had associated smoking habits and present or past alcohol consumption (n=5/8; 62.5%) (Table 3). Regarding origin, 5 (62.5%) came from internal referrals from the OCM.

Two participants had reported previous AC before the diagnosis of SCC. One refused to undergo a diagnostic biopsy and followed up the case, returning after four years with the SCC already developed. The second was followed up for two years, refusing to undergo a diagnostic biopsy and later being diagnosed with SCC (Figure 1:A-D). The other 6 participants had been referred to the Stomatology Clinic with suspicion of SCC and no previous lesions.

Table 4 shows the occupational data of the participants with CCEL. The majority of participants with CCEL came from an internal referral from the OCM (n=5/62.5%), military (n=6/75.0%), veterans (n=5/62.5%), and not practicing outdoor sports (n=5/62.5%). Among the military, most were enlisted (n=4/66.7%), and half were from Navy personnel (n=3/50.0%). However, we found no statistically significant association between occupational data and the diagnosis of SCC.

TABLE 3. SOCIODEMOGRAPHIC DATA ON LIP SQUAMOUS CELL CARCINOMA

ORAL SQUAMOUS CELL CARCINOMA ON THE LIP	Total (n=8)	
	n	%
Sex		
Male	6	75.0%
Female	2	25.0%
Age		
<50 years	1	12.5%
≥50 years	7	87.5%
Skin color		
White	8	100.0%
Brown	0	0.0%
Black	0	0.0%
Smoking		
Yes	3	37.5%
No	3	37.5%
Ex-smoker	2	25.0%
Alcoholic		
Yes	8	100.0%
No	0	0.0%
Former alcoholic	0	0.0%
Smoking + Drinking		
Yes	5	62.5%
No	3	37.5%

Figure 1. Clinical photographs showing the clinical evolution of actinic cheilitis in squamous cell carcinoma of the lip; **A** Initial consultation suggesting a clinical diagnosis of more severe AC; **B** and **C** After two years with suspicion of SCC; **D** Positive toluidine blue test in an area of atrophy, the site of the incisional biopsy.

TABLE 4. SOCIODEMOGRAPHIC DATA ON LIP SQUAMOUS CELL CARCINOMA

ORAL SQUAMOUS CELL CARCINOMA ON THE LIP	Total (n=8)		p
	n	%	
Origin			0.727Φ
OCM	5	62.5%	
Extra-OCM	3	37.5%	
Situation			0.197¥
Active	1	12.5%	
Veteran	5	62.5%	
Relative of military personnel	2	25.0%	
Occupational exposure			0.289Φ
Military	6	75.0%	
Relative of military personnel	2	25.0%	
Outdoor sports/leisure			0.727Φ
Yes	3	37.5%	
No	5	62.5%	
Occupational exposure + Sport			0.070Φ
Yes	1	12.5%	
No	7	87.5%	
Military Rank			0.688Φ
Enlisted	4	66.7%	
Officer	2	33.3%	
Division			0.572¥
Navy	3	50.0%	
Marine Force	1	16.7%	
Health division	1	16.7%	
Auxiliary division	1	16.7%	

¥ Chi-square test; Φ Binomial test

DISCUSSION

This is the first study to evaluate the association between AC and CCEL, analyzing the presence and severity of OED in military personnel and their relatives in the Brazilian Navy, considering sociodemographic and occupational factors. The results indicated that most participants with AC and LSCC are referred to the OCM Stomatology Clinic by other clinics of the various dental specialties of this OM. In addition, the study results showed that, compared with referrals from other sectors of the Brazilian Navy's Health Care System, cases from the OCM had a lower severity of OED. This difference proved to be statistically significant.

These results demonstrate the importance of the Brazilian Navy's Oral Health Program (PSB), published in its manual in 2009 and advocates actions aimed at preventing diseases, promoting health, and raising awareness among users of the Navy's Health System (30). As part of the PSB's preventive measures, the OCM conducts continuous training for health professionals, emphasizing the screening of oral diseases, including identifying AC. With a focus on users of the health system, educational talks on the oral cancer prevention program are given weekly in the OCM's waiting rooms and periodically in operational military organizations, where the importance of early diagnosis of AC and SCC for the military is reported, mainly highlighting preventive measures and the need for early diagnosis. This work focused on prevention through information that may justify the results observed in our study.

In addition, following the guidelines recommended by the PSB for PMD, patients with AC are periodically monitored by the Stomatology Clinic, through a clinical examination carried out by experienced stomatologists, photographic records and the use of the toluidine blue test. Besides, during all the consultations, the professionals reinforce the instructions for prevention and personal care of

AC, emphasizing the importance of using lip balm, wearing a wide-brimmed hat with UV protection, and not exposing yourself to the sun, especially when UV rays are most intense. These practices may have contributed to the low number of cases of AC that progressed to SCC during the 12-year follow-up period covered by this study, but further studies are needed to confirm this data.

According to Medeiros *et al*. (24), malignant transformation of AC into SCC occurs in 10 to 30% of cases, with 95% of SCC preceded by AC. Among our participants, only two were previously diagnosed with AC. Both men, even after being advised of the risk of malignancy of their lesions, chose not to follow up properly, resulting in the malignization of the lesions. The other participants with SCC had already been referred to the Stomatology Clinic with a suspicion of malignancy, which was later confirmed by biopsy.

According to Paulino *et al*. (31), the rate of malignant transformation of AC increases significantly, ranging from 9.6 to 43.2%, when individuals have an occupational function with sun exposure. A study of 212 military veterans of the wars in Afghanistan and Iraq found that 63% of the participants had suffered an acute injury during their mission as a result of sun exposure, and only 23% had been advised of the risk of developing cancer as a result of sun exposure (22). Given the occupational nature of AC in military personnel and the increased risk of developing SCC, our results highlight the crucial role played by the PSB and the Stomatology Clinic in the MB Health System, enabling the prevention, early diagnosis, control and reduction of the rate of malignant transformation of AC.

In a previous study carried out at the OCM Stomatology Clinic, the prevalence of AC was 2.7% of all lesions diagnosed between 2011 and 2014, with military personnel accounting for 79.3% of the 29 cases (18). In a subsequent survey at this service, from 2011 to 2019, the number of AC diagnoses increased to 87 cases (16). This study shows a continuous increase, totaling 136 patients with a clinical diagnosis of AC. Notably, the number of military personnel diagnosed with AC and CCEL (83.1% and 75.0%, respectively) substantially exceeded that of military relatives (16.9% and 25%, respectively).

A study by Penoni *et al*. (32) about the profile of patients treated at the OCM indicated a significantly higher percentage of military relatives compared to military personnel. However, our study suggests a higher rate of military participants with AC. The result also reinforces that most of these patients were almost exclusively at risk of occupational sun exposure since only 15 (16.9%) practiced outdoor sports/leisure. This suggests that occupational sun exposure in military personnel plays a fundamental role in the development of AC and that other preventive measures should be adopted to avoid the onset and progression of this MPD. The number of Navy personnel with AC and CCEL reported in this study is much higher than that reported in the literature for a similar population and/or occupational factor (33,34). A cross-sectional study of 395 military police officers in a southeastern Brazilian city assessing the frequency of oral injuries found only two participants with AC and no cases of SCC.

Cigic *et al*. (33), also carried out a cross-sectional study of the frequency of oral injuries in 102 military veterans from Croatia, diagnosing two cases of AC and one of SCC. Although the comparison between these studies and the work described here is not ideal, due to the small sample and their different scopes, these are the only ones in the literature dedicated to the civilians (represented by the military relatives) and the military personnel. This difference in results may be due to the easier access to dental care within MB and its PSBs, increasing the total number of dental appointments and possibly the number of diagnoses of AC by the Stomatology Clinic.

On the other hand, this study found no statistically significant association between occupational status and the severity of OED.

The clinical profile of patients who develop AC reported in the literature that the main area affected is the lower lip; white individuals between the fourth and fifth decade of life and who have been exposed to the sun for long periods during their lives can also be observed in the clinical and demographic profile of this sample, since it was observed that the most affected anatomical area was the lower lip, the majority were white (85.4%) and military veterans (68.5%), individuals over the age of 45, with soldiers from operative divisions being more affected than officers (7,20,24). It is well known that enlisted perform more executive functions than officers, who mostly perform strategic administrative and planning functions. This leads them to carry out more operational duties outdoors and consequently with more frequent exposure to the sun, making them the most exposed occupational profile.

SCC also has a predilection for the lower lip in white men between 60 and 70 (7,20,35). Chronic exposure to UV rays is its main risk factor, and it is associated with drinking and smoking habits, so the risk of developing this neoplasm increases considerably (6,7,10,35,36). These data are similar to those observed in the results of this study since all the cases affected the lower lip, with the majority (75%) being men and smoking and drinking habits being observed in 62.5% of the cases.

Riemenschneider *et al*. (19), in their systematic review, found that there is substantial evidence to suggest a high risk of developing melanoma and non-melanoma skin cancer in the military, lesions which, like SCC, have similar risk factors, and showed that the incidence rate in the military is higher when compared to the general population, from the age of 45 and especially in the 55 and 60 age group. In this study, the age group that includes the over-50s represents 87.5% of the sample and is within the range reported for the military population in previous studies. However, we observed a case of an active-duty military man, a seaman, who was only 29 years old and diagnosed with SCC. Cases like this demonstrate the need to intensify educational and preventive measures, also focusing on younger people.

CONCLUSION

The data on individuals with AC and SCC diagnosed by the OCM Stomatology Clinic reported here agree with the results of case series and retrospective studies reported elsewhere on the occupational factor. On the other hand, they show that the PSB and the periodic follow-up of patients with AC, carried out in the Brazilian Navy, play an important role in the management of this lesion and can delay or even prevent the appearance of SCC in this population with a military occupational risk factor, when patients are made aware and have access to a specialized stomatology service.

The authors declare that there is no conflict of interest.

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REFERENCES

1. Romagna DV, Oliveira MMD, Abreu LG, Stein C, Hugo FN, Teixeira R, *et al*. Incidence and mortality rates of lip, oral cavity, and pharynx cancers in Brazil: time-trend and age-period-cohort analysis from the last 30 years. Global Burden of Disease Study. Rev Soc Bras Med Trop. 2022;55(Suppl 1):e0286-2021.
2. Alshami ML, Al-Maliky MA, Alsagban AA, Alshaeli AJ. Epidemiology and incidence of oral squamous cell carcinoma in the Iraqi population over 5 years (2014–2018). Health Sci Rep. 2023 Jul 25;6(4):e1205.
3. Du M, Nair R, Jamieson L, Liu Z, Bi P. Incidence Trends of Lip, Oral Cavity, and Pharyngeal Cancers: Global Burden of Disease 1990–2017. J Dent Res. 2020 Feb 1;99(2):143-51.
4. Ling Z, Cheng B, Tao X. Epithelial-to-mesenchymal transition in oral squamous cell carcinoma: Challenges and opportunities. Int J Cancer. 2021;148(7):1548-61.
5. Mattos MV, Honorato J, de Assumpção Leite AFS, de Oliveira SP, Lourenço S de QC. Queilite actínica ("Lábios de Marinheiro"): uma Revisão para o Clínico. RNO. 2023;50(2):39-45.
6. de Oliveira Santos M, de Lima FC da S, Martins LFL, Oliveira JFP, de Almeida LM, de Camargo Cancela M. Estimativa de incidência de câncer no Brasil, 2023-2025. RBC. 2023;69(1) (accessed on Oct 8th, 2023). Available at: https://rbc.inca.gov.br/index.php/revista/article/view/3700.
7. Silva LV de O, de Arruda JAA, Abreu LG, Ferreira RC, da Silva LP, Pelissari C, *et al*. Demographic and Clinicopathologic Features of Actinic Cheilitis and Lip Squamous Cell Carcinoma: a Brazilian Multicentre Study. Head Neck Pathol. 2020 Dec;14(4):899-908.
8. Bakirtzi K, Papadimitriou I, Andreadis D, Sotiriou E. Treatment options and post-treatment malignant transformation rate of actinic cheilitis: a systematic review. Cancers. 2021;13(13):3354.
9. Markopoulos A, Albanidou-Farmaki E, Kayavis I. Actinic cheilitis: clinical and pathologic characteristics in 65 cases. Oral Dis. 2004;10(4):212-6.
10. Lopes MLD de S, Silva Júnior FL da, Lima KC, Oliveira PT de, Silveira ÉJD da. Clinicopathological profile and management of 161 cases of actinic cheilitis. An Bras Dermatol. 2015;90(4):505-12.
11. Piñera-Marques K, Lorenço SV, Silva LFF da, Sotto MN, Carneiro PC. Actinic lesions in fishermen's lower lip: clinical, cytopathological and histopathologic analysis. Clinics (Sao Paulo). 2010 Apr;65(4):363–7.
12. Rodriguez-Blanco I, Florez A, Paredes-Suarez C, Rodriguez-Lojo R, Gonzalez-Vilas D, Ramirez-Santos A, *et al*. Actinic cheilitis prevalence and risk factors: a cross-sectional, multicentre study in a population aged 45 years and over in north-west Spain. Acta dermato-venereologica. 2018;98(10):970-4.
13. de Oliveira Ribeiro A, da Silva LCF, Martins-Filho PRS. Prevalence of and risk factors for actinic cheilitis in Brazilian fishermen and women. Int J Dermatol. 2014 Nov;53(11):1370-6.
14. Vasilovici A, Ungureanu L, Grigore L, Cojocaru E, Şenilă S. Actinic Cheilitis - From Risk Factors to Therapy. Front Med (Lausanne). 2022 Feb 15;9:805425.
15. Lupu M, Caruntu A, Caruntu C, Boda D, Moraru L, Voiculescu V, *et al*. Non-invasive imaging of actinic cheilitis and squamous cell carcinoma of the lip. Mol Clin Oncol. 2018 May;8(5):640-6.
16. Miranda AMO, Soares LG, Ferrari TM, Silva DG, Falabella MEV, Tinoco EMB. Prevalence of actinic cheilitis in a population of agricultural sugarcane workers. AOL. 2012 Oct;25(2):201-7.

17. Macedo JC. Incidência de queilite actínica em militares da ativa/inativos atendidos na clínica na clínica de estomatologia da Odontoclínica Central da Marinha: uma proposta de intervenção. Rio de Janeiro. [Trabalho de Conclusão de Curso - Odontologia] – Marinha do Brasil; 2020.
18. Boldes IP, de Azevedo AB, da Cunha Macedo J, Silami MANC, Penoni DC, de Carvalho Andrade MA. Queilite actínica: análise retrospectiva de 29 casos da Clínica de Estomatologia da Odontoclínica Central da Marinha. RNO. 2016;43(1) (accessed on Oct 6th, 2023). Available at: http://portaldeperiodicos.marinha.mil.br/index.php/odontoclinica/article/view/16.
19. Riemenschneider K, Liu J, Powers JG. Skin cancer in the military: A systematic review of melanoma and nonmelanoma skin cancer incidence, prevention, and screening among active duty and veteran personnel. J Am Acad Dermatol. 2018 Jun;78(6):1185-92.
20. Mello FW, Melo G, Modolo F, Rivero ERC. Actinic cheilitis and lip squamous cell carcinoma: Literature review and new data from Brazil. J Clin Exp Dent. 2019 Jan 1;11(1):e62-9.
21. Wolf ST, Kenney LE, Kenney WL. Ultraviolet Radiation Exposure, Risk, and Protection in Military and Outdoor Athletes. Curr Sports Med Rep. 2020 Apr;19(4):137-41.
22. Powers JG, Patel NA, Powers EM, Mayer JE, Stricklin GP, Geller AC. Skin cancer risk factors and preventative behaviors among United States military veterans deployed to Iraq and Afghanistan. J Invest Dermatol. 2015;135(11):2871-3.
23. Lea CS, Efird JT, Toland AE, Lewis DR, Phillips CJ. Melanoma incidence rates in active duty military personnel compared with a population-based registry in the United States, 2000–2007. Mil Med. 2014;179(3):247-53 (Accessed on Dec 24st, 2023). Available at: https://academic.oup.com/milmed/article-abstract/179/3/247/4160738.
24. Medeiros CK, Lopes ML, Silveira ÉJ, Lima KC, Oliveira PT. Actinic cheilitis: Proposal of a clinical index. Med Oral Patol Oral Cir Bucal. 2022 Jul 1;27(4):e310-8.
25. de Castro Abrantes T, Fonsêca TC, Cabral MG, Agostini M, Benevenuto de Andrade BA, Romañach MJ, *et al*. Epithelial Dysplasia in Actinic Cheilitis: Microscopic Study of 70 Cases from Brazil. Head Neck Pathol. 2021 Jun;15(2):566-71.
26. de Azevedo AB, Dos Santos TCRB, Lopes MA, Pires FR. Oral leukoplakia, leukoerythroplakia, erythroplakia and actinic cheilitis: Analysis of 953 patients focusing on oral epithelial dysplasia. J Oral Pathol Med. 2021 Sep;50(8):829-40.
27. El-Naggar AK, Chan JKC, Grandis JR, Takata T, Slootweg PJ. WHO Classification of Head and Neck Tumours. 2017 (Accessed on Dec 24th, 2023). Available at: https://publications.iarc.fr/Book-And-Report-Series/Who-Classification-Of-Tumours/WHO-Classification-Of-Head-And-Neck-Tumours-2017.
28. Brasil. Lei Nº 6.880, de 9 de dezembro de 1980. Dispõe sobre o Estatuto dos Militares. Diário Oficial da União 9 de dez 1980 (Accessed on Mar 10th, 2024). Available at: https://www.planalto.gov.br/ccivil_03/leis/l6880.htm.
29. Kujan O, Oliver RJ, Khattab A, Roberts SA, Thakker N, Sloan P. Evaluation of a new binary system of grading oral epithelial dysplasia for prediction of malignant transformation. Oral Oncol. 2006 Nov;42(10):987-93.
30. Talon LSM. Saúde bucal programa de saúde bucal na Marinha: em busca de uma atitude preventiva nos usuários do sistema de saúde da Marinha. Trabalho de Conclusão de Curso [Graduação em Odontologia] – Marinha do Brasil; 2011.
31. Paulino JNV. Prevalência de queilite actínica e fatores associados: uma revisão sistemática. Trabalho de Conclusão de Curso [Graduação em Odontologia] – Universidade Federal do Rio Grande do Norte; 2015 (Accessed on Oct 7th, 2023). Available at: https://repositorio.ufrn.br/handle/123456789/39172.
32. Penoni DC, Carlos JC, Santos IAR dos, Baptista L da S, Souza EB de, Leão ATT. O perfil clínico e demográfico do paciente assistido pela Odontoclínica Central da Marinha e o papel do cirurgião-dentista na atenção integral à saúde. RNO. 2018;45(1) (Accessed on Dec 21st, 2023). Available at: https://www.portaldeperiodicos.marinha.mil.br/index.php/odontoclinica/article/view/https%3Adoi.org10.2932725149.45.1.
33. Cigic L, Martinovic D, Martinic J, Kovic M, Druzijanic A, Galic I, *et al*. Increased prevalence of oral potentially malignant lesions among Croatian War invalids, a cross-sectional study. J Clin Exp Dent. 2023 Sep;15(9):e734-41.
34. Araújo VS, Godinho EL, Farias LC, Marques-Silva L, Santos SHS, Rodrigues-Neto JF, *et al*. Prevalence of oral mucosal lesions in a brazilian military police population. J Clin Exp Dent. 2015 Abr 1;7(2):e208-11.
35. Souza LR, Fonseca Fonseca T, Oliveira Santos CC, Corrêa GTB, Santos FBG, Cardoso CM, *et al*. Lip squamous cell carcinoma in a Brazilian population: epidemiological study and clinicopathological associations. Med Oral Patol Oral Cir Bucal. 2011 Sep 1;16(6):e757-62 (Accessed on Jan 2nd, 2024]. Available at: https://roderic.uv.es/handle/10550/60091.
36. Narayanan DL, Saladi RN, Fox JL. Review: Ultraviolet radiation and skin cancer. Int J Dermatology. 2010 Sep;49(9):978-86.