

Chronic Lip Fissure: Clinical Presentation and Risk Factors

P.M. Skrypnykov¹, I.M. Tkachenko², O.A. Pysarenko^{1*}, T.A. Khmil¹,
T.P. Skrypnikova¹, Y.V. Tymoshenko¹, O.O. Kulai¹

1. Department of postgraduate dentists' education, Poltava State Medical University, Poltava, Ukraine.

2. Department of propaedeutics of therapeutic dentistry, Poltava State Medical University, Poltava, Ukraine.

Abstract

We conducted a cross-sectional study among patients seeking care at the Medical and Consultation Center for the Treatment of Oral Mucosa Diseases of Poltava State Medical University. Our aim was to determine the prevalence of chronic lip fissure among patients seeking care at this facility.

The Chi-square test was applied to establish the correlation (associative links) between the presence of chronic lip fissure and sociodemographic factors, the presence of bad habits and occupational hazards or work conditions. Using a multivariable logistic regression model, we identified independent risk factors (independent predictors), associated with the occurrence of chronic lip fissure. These factors include gender, age, level of education, bad habits such as smoking, and exposure to unfavorable climatic working conditions.

Gaining insights into the causes and clinical presentation of chronic lip fissure is paramount for its prevention, providing proper explanation, and raising awareness among patients about the factors contributing to its occurrence.

Clinical article (J Int Dent Med Res 2023; 16(4): 1662-1669)

Keywords: Chronic lip fissure, cheilitis.

Received date: 03 October 2023

Accept date: 01 November 2023

Introduction

Each organ of the oral cavity plays a pivotal role in providing the body's vital functions and maintaining harmony with the external environment.

In anatomy textbooks, the lips are defined as a distinct organ in the "Head" section. They perform a variety of functions: closing, sucking, chewing, barrier, excretory, sensory, speech, respiratory, digestive, adaptive, behavioral, aesthetic, and cosmetic.

The lips consist of three zones.¹ The vermilion zone is a connective tissue located between the skin and mucosa. Its surface is folded and acquires a high degree of diversity with age.² Histologically, there are no sebaceous or mucous glands in the vermilion zone. Its epithelium is keratinized but thinner and more translucent than the skin. The connective tissue

papillae of the lamina propria are relatively longer and narrower than those found in the skin and contain capillary loops. The proximity of these vessels to the surface, combined with the translucency of the epithelium, gives the surface a red color.³

The lips are exposed to both external and internal irritants, and these unfavorable stimuli cause various lip disorders.^{4,5}

First of all, they affect the vermilion zone and cause both inflammatory (cheilitis) and non-inflammatory processes (cheilosis). These two categories differ in etiology, pathogenesis, and clinical course.⁶

Chronic lip fissure is a distinct condition that is mentioned among the disorders of the lips in the International Classification of Diseases, 11th Revision, as of 2019⁵. It is highlighted in the textbook *Oral and Maxillofacial Diseases* as a separate disorder in the section "Physical and chemical injuries".⁷

Chronic lip fissure is a linear ulcer that can affect both the upper and lower lips either along the central line or eccentrically.⁸ It is a pathology that is accompanied not only by inflammation, impaired function, aesthetics, prolonged epithelialization, recurrence, etc. but

*Corresponding author:

Olena A. Pysarenko, PhD, Associate Professor,
Department of postgraduate dentists' education, Poltava State
Medical University, Poltava, Ukraine.
E-mail: o.pysarenko@pdmu.edu.ua

also by the possibility of malignant transformation.⁹ Since more than 6% of chronic lip inflammation is associated with a risk of malignant transformation, adequate and early treatment is essential^{10, 11}

Authors commonly refer to the mild form of chronic lip fissure as simple cheilitis (cheilitis simplex).¹² Among its clinical manifestations, one of the most common subtypes is characterized by lip cracking/desquamation (cracked lips, common cheilitis, cheilitis sicca), usually seen on the lower lip. Causative factors include cigarette smoking and smokeless tobacco use, lip chewing habits, and poor oral hygiene.

The disease affects about 0.6% of the population, and its etiology remains unclear.⁷

Individual anatomical features of the lip structure are among the possible "causative" factors of chronic lip fissure. Axéll T, Skoglund A, et al.¹⁰ suggested that the lesion is a consequence of the physiological weakness of the tissues along the embryonic fusion planes; this theory is supported by the observation that fissures of the lower lip tend to occur along the midline, while fissures of the upper lip often occur somewhat lateral to the midline.

Another factor is chronic mechanical trauma by sharp edges of teeth, dentures, or orthodontic appliances. The article by Kluemper et al.¹³ reports that malpositioned anterior teeth in combination with the habit of chronic movement of the lip mucosa over the tooth can serve as chronic mechanical irritation, leading to the formation of a chronic fissure.

Self-injurious habits in the oral cavity, such as picking teeth, biting and licking the lips, as well as smoking, can contribute to the development of a chronic lip fissure. In addition, the occurrence of a fissure is associated with working in unfavorable meteorological conditions. Evans et al.¹⁴ suggested that the median lip fissure was initially caused by dry, cold weather, but its persistence was due to secondary staphylococcal infection in this weather. There was no direct correlation between the persistent nature of the fissures and *Candida* hyphae. However, in one case, reactive epithelial atypia was observed.

In addition, some professions are directly at risk of developing chronic lip fissure, namely musicians who play wind instruments.

Some authors highlighted the potential cause-and-effect relationships leading to the

occurrence of chronic lip fissure, namely hypovitaminosis A, B1, B6, and B12, gastrointestinal pathology, as well as endocrine and neurovascular disorders.¹² Combes J. reported a case of chronic lip fissure in a patient with diabetes mellitus.⁸

The prevalence of lip fissures is reported to be higher in patients with orofacial granulomatosis, Crohn's disease, and Down syndrome. Patients with Down syndrome often breathe through the mouth, mainly due to lip dislocation, tongue protrusion, hypersalivation, or a high incidence of persistent rhinitis caused by narrow and partially obstructed airflow through the nose.¹⁵

With the development of persistent chronic lip fissure, saprophytic microflora of the oral cavity becomes involved, especially in case of insufficient oral hygiene. Histological studies indicate chronic inflammation. The epithelium is characterized by regenerative, hyperplastic, and in some cases metaplastic proliferation.¹⁶

Materials and methods

We conducted a cross-sectional study among patients seeking care at the Medical and Consultation Center for the Treatment of Oral Mucosa Diseases (Poltava, Ukraine), established at the Department of Postgraduate Education of Dentists of Poltava State Medical University of Poltava State Medical University. Data were collected for 12 months from August 2022 – August 2023. The study included patients who sought dental care at the above center. All patients with chronic lip fissure, regardless of age and gender, were included in the study. A sample size of 634 subjects was identified using the WHO sample size determination software at a 95% confidence level with an expected proportion of the population of 0.6% with a chronic lip fissure. Among them, 14 were excluded because they refused to provide data for the questionnaire. Thus, 620 participants took part in the study, from whom voluntary consent to the use of personal data was obtained.

Statistical analysis was conducted using descriptive and inferential statistics. Quantitative variables such as age, smoking and alcohol consumption, duration of outdoor exposure/work in adverse weather conditions, and the presence of harmful habits were selected as factors that have a high impact on the occurrence of chronic

lip fissure. Pearson's χ^2 test was used to determine the association between the occurrence of chronic lip fissure and clinical and demographic variables. Factors associated with chronic lip fissure were identified by multiple logistic regression analysis using a backward stepwise selection procedure. The p-value for model entry was set to <0.20 . MedCalc statistical software (MedCalc Software Ltd, Belgium) was used for all analyses, taking into account a 5% confidence level ($p \leq 0.05$).

The aim of our descriptive study was to analyze the prevalence of chronic lip fissure among the population of the Poltava region (Ukraine) who sought dental care at the regional scientific and practical center for diseases of the oral mucosa; to identify the relationship between clinical features and etiological risk factors. The results of the study were compared with similar data from the scientific literature.

Data were collected using a questionnaire specially designed for this study and by medical examination.

The questionnaire included the patient's sociodemographic data (gender, age), education (secondary, higher), information about the type of occupation/presence of occupational hazards, and working conditions (as recommended by Axéll T., Skoglund A.).¹⁰

Information on general health status (presence of bad habits, smoking (divided according to the number of cigarettes consumed in the last 30 days), alcohol consumption, use of protective creams/lipsticks for the vermilion surface, duration of the disease for the first time or repeatedly, treatment of chronic fissure by a dentist, awareness of the causes/treatment of this nosology).

After filling out the questionnaire, a medical examination of the oral cavity was performed according to the WHO (Pinborg) scheme¹⁷ and the area and the lesion itself were carefully described. Thus, two researchers recorded the presence of a crack on the upper or lower lip. Its localization on the red border (vermillion zone) was median (corresponding to the projection of the lines of attachment of the frenulum of the lower or upper lip) or eccentric/lateral (located between the median line and the corner of the mouth). The course of the disease was defined according to the duration of its occurrence: chronic or recurrent. Further, the severity (mild, moderate, or severe)

of the fissure was determined. The presence of a small, shallow crack, minor scales along its edges, and mild edema were assessed as mild severity. Moderate severity – a more pronounced crack, with more manifested erythema and swelling at the edges. Severe degree – the crack resembles a "cleft" lip, with the presence of hemorrhagic crusts, induration, and atrophic areas. With the consent of the patients, photographic recording was performed using a camera of a mobile phone Huawei P smart (Xiaomi Tech, China).

Results

Among the 620 study participants who sought help for diseases of the oral mucosa, 279 individuals (45%) were male, and 341 (55%) were female. The mean age was 45 (SD \pm 16.4) years. In terms of education, 197 participants (31.8%) had completed secondary education, while 423 participants (68.2%) held higher education qualifications.

All were white-skinned people. By occupation, 268 individuals (43.2%) were exposed to occupational hazards, with the nature of these hazards varying: 55 (20.5%) were primarily engaged in outdoor work, 82 (30.6%) were mainly involved in outdoor work, 41 (15.3%) predominantly worked indoors, and 91 (33.6%) exclusively worked indoors. An expressive proportion of the sample employed protective measures, with 403 participants (69%) using hats, and 261 participants (42%) using lip protection products such as lipsticks, creams, and lip balms to safeguard against weather-related effects.

Regarding lifestyle and various habits (including bad habits), we observed smoking ($n=269$; 43.4%), alcohol consumption ($n=183$; 29.5%), mostly in men, and the presence of licking, biting, and "scratching" the lip with teeth ($n=207$; 33.4%). The subjects periodically sought medical care, including dental treatment ($n=498$; 80.5%), and some patients ($n=125$; 20.2%) were informed about the need to eliminate the habit or were prescribed treatment ($n=63$; 10.2%). Among the subjects ($n=461$; 74.5%), there were concomitant diseases for which they received periodic treatment.

The prevalence of chronic lip fissure in the studied sample was $n=11$; 1.77%. In 3 cases (27.2%), the duration of the disease was up to six months, in 8 cases (72.8%) – from 1 to 3 years.

Improvement and epithelialization of defects after therapeutic treatment alternated with exacerbations, predominantly occurring during the autumn-winter period. Chronic fissure was observed in the lower lip area (n=10; 90.9%) and in 1 case (9.1%) in the upper lip area. The crack was predominantly located in the central region (n=10; 90.9%), with only one case exhibiting an eccentric location (n=1; 9.1%). Among all cases of chronic lip fissure, 3 cases (27.3%) were classified as mild, 6 cases (54.5%) as moderate, and 2 cases (18.2%) as severe. The most typical clinical findings of chronic lip fissure are presented in Fig. 1.

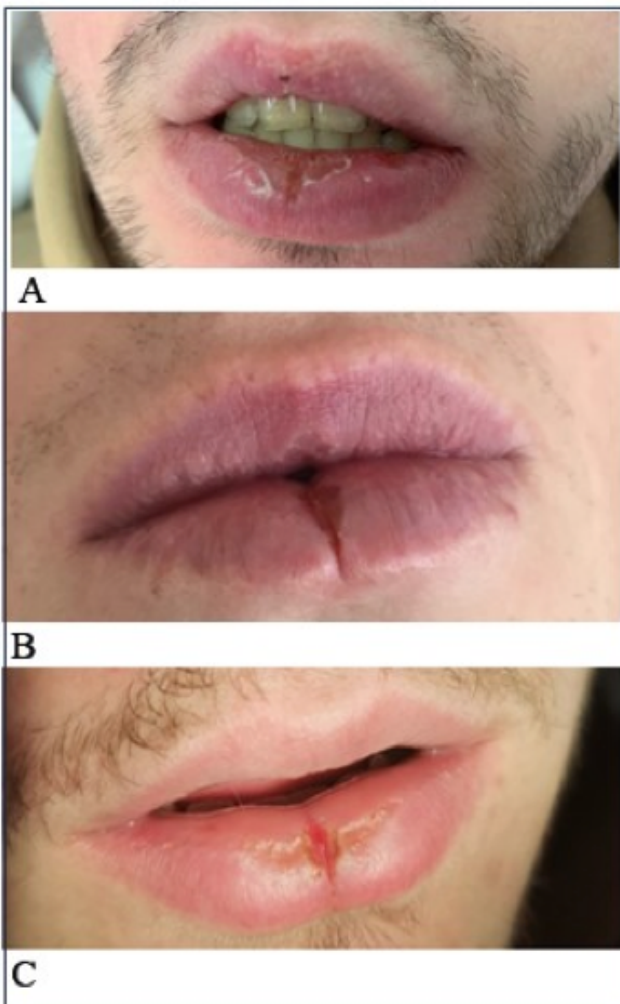


Figure 1. Clinical characteristics observed in chronic lip fissure (CLF). A. Mild CLF B. Moderate CLF C. Severe CLF.

Among the 11 participants diagnosed with chronic lip fissure, there were 10 men (1.61%) and 1 woman (0.16%). The largest subgroup affected by chronic lip fissure consisted of 8

individuals (1.29%), falling within the age range of 18 to 45 years.

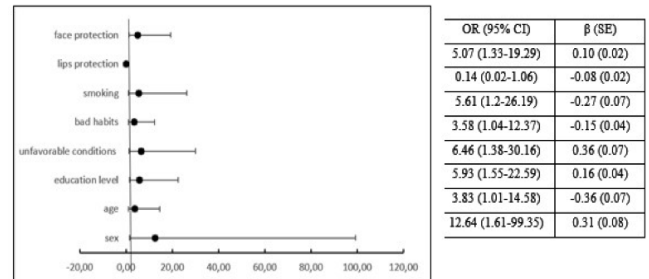


Figure 2. Multivariable logistic regression model: forest plot representation of the table 3. CI: confidence interval; OR: odds ratio; SE: standard error; β : coefficient of covariates.

Variables	Presence of chronic lip fissure		PR	95%CI	p-value
	Yes (%)	No (%)			
Sex					
Male	10 (3.6)	269 (96.4)	12.22	1.57-94.89	0.002
Female	1 (0.3)	340 (99.7)			
Age					
18-45	8 (3.1)	250 (96.9)	3.74	1.00-13.97	0.035
46-75	3 (0.8)	359 (99.2)			
Educational level					
Secondary education	8 (4.1)	189 (95.9)	5.73	1.54-21.35	0.003
High school	3 (0.7)	420 (99.3)			
Unfavorable conditions					
working Yes	9 (3.4)	250 (96.6)	5.91	1.29-27.13	0.019
No	2 (0.6)	359 (99.4)			
Bad habits					
Yes	7 (3.4)	200 (96.6)	3.75	1.11-12.68	0.022
No	4 (0.9)	440 (99.1)			
Smoking					
Yes	9 (3.3)	260 (96.7)	6.21	1.35-28.49	0.007
No	2 (0.5)	369 (99.5)			
Alcohol drinking					
Yes	1 (2.2)	182 (97.8)	0.24	0.031-1.85	0.134
No	10 (1.7)	427 (98.3)			
Alcoholic beverage consumption					
more than 2 shots	0(0)	52 (100)	3.58	0.15-86.77	0.762
1 shot in last 30 days	1 (5.7)	567 (94.3)			
Smoking and alcohol drinking					
Yes	1 (2.2)	44 (97.8)	1.28	0.17-9.76	0.813
No	10 (1.7)	565 (98.3)			
Head and face protection					
Yes	3 (0.7)	399 (99.3)	4.92	1.32-18.35	0.012
No	8 (3.2)	210 (96.8)			
Use of protective with SPF lipstick/balm/cream					
Yes	1 (0.4)	260 (99.6)	0.14	0.02-1.07	0.025
No	10 (2.8)	349 (97.2)			

Table 1. Sociodemographic and occupational variables and habits associated with chronic fissure of lip in patients of diagnostic and treatment center. Pearson's χ^2 test – statistically significant p-values of 0.05 or less. PR-prevalence ratio, 95%CI confidence interval.

Among patients diagnosed with chronic lip fissure, concurrent pathologies were identified, including gastrointestinal diseases in 6 cases (54.5%), diabetes mellitus in 2 cases (18.2%),

allergic reactions to poplar fluff in 2 cases (11.8%), and neurovascular diseases in 1 case (9.1%). It is worth noting that the latter patient had a smoking history of 12 years. None of the patients had a family history of lip fissures.

Bivariate analysis revealed a significant association between the presence of chronic lip fissure and male gender ($p=0.002$), lack of protection of the vermilion zone with creams/lipsticks/balms ($p=0.025$), smoking ($p=0.007$), and the presence of self-injurious habits ($p=0.022$). On the other hand, alcohol consumption and its combination with smoking have no significant association with the presence of chronic lip fissure (Table 1). Regarding the risk factors associated with the development of chronic lip fissure, the results of the bivariate analysis are given in Table 2. There is a certain correlation between the duration of smoking ($p=0.021$), the number of cigarettes consumed per day ($p=0.027$), the presence of a bad habit ($p=0.053$), and occupation ($p=0.054$).

Variables	Presence of chronic lip fissure		PR	95%CI	p-value
	Yes (%)	No (%)			
Unfavorable working conditions; environmental conditions Outdoor workers	5 (9.3)	49 (90.7)	1		0.054
Probably outdoor workers	2 (2.4)	80 (97.6)	3.79	0.76-18.87	
Probably indoor workers	1 (2.4)	40 (97.6)	3.79	0.46-31.26	
Indoor workers	1 (1.1)	90 (98.9)	8.43	1.01-70.23	
Bad habits Lip licking Sucking and biting the lower lip	3 (1.9) 4 (7.4)	150 (98.1) 50 (92.6)	0.26	0.06-1.14	0.053
Duration of smoking Less than 4 years 4-12 years	2 (1.2) 7 (7.2)	170 (98.8) 90 (92.8)	0.16	0.93-0.76	0.021
Number of cigarettes per day Less than 20 /day More than 20/ day	3 (1.6) 6 (7.4)	185 (98.4) 75 (92.6)	0.22	0.06-0.84	0.027

Table 2. Association between the presence of chronic fissure of lip and risk factors in individuals.

Multivariable modeling (Table 3) revealed statistically significant associations between the presence of chronic lip fissure with age ($p=0.049$), gender ($p=0.016$), duration of the study participant's exposure to adverse weather conditions during work ($p=0.018$), the lack of face protection in general ($p=0.054$) and the vermilion zone in particular ($p=0.053$), the presence of self-injurious habits ($p=0.044$) and smoking ($p=0.028$). Therefore, the patient's gender, age, level of education, bad habits, smoking, as well as working in unfavorable climatic conditions were identified as

independent risk factors (independent predictors) for the occurrence of chronic lip fissure.

Variables	References	Predictor	PR	aPR	95%CI	p-value
Sex	Female	Male	12.22	12.64	1.61-99.35	0.016
Age	46-75	18-45	3.74	3.83	1.01-14.58	0.049
Educational level	High school	Secondary education	5.73	5.93	1.55-22.59	0.009
Unfavorable working or environmental conditions	No	Yes	6.27	6.46	1.38-30.16	0.018
Bad habits	No	Yes	3.49	3.58	1.04-12.37	0.044
Smoking	No	Yes	5.46	5.61	1.20-26.19	0.028
Use of protective with SPF lipstick/balm/cream	Yes	No	0.14	0.14	0.02-1.06	0.053
Face protection	Yes	No	4.92	5.07	1.33-19.29	0.017

Table 3. Independent variables associated with chronic lip fissure. Multivariable logistic regression model table of effects with 95% Cis.

Discussion

Diseases of the lips can be either independent conditions or a manifestation of systemic diseases and syndromes or a local manifestation of dermatoses.¹⁹ Correct diagnosis is highly important because these disorders can be divided into reversible, predominantly reversible, and predominantly persistent, which requires certain efforts and treatment tactics. Furthermore, the vermilion zone is of paramount importance as it constitutes a crucial aspect of facial aesthetics, profoundly impacting a patient's social interactions and self-esteem.

In our study, the prevalence of chronic lip fissure was 1.77%, which can be explained by the fact that the counseling and treatment center specializes in providing care to patients with diseases of the oral mucosa. The obtained prevalence values are higher than those reported by Combes et al.⁸ - 0.6%. According to Rosenquit et al.¹⁹, the prevalence of the lesion is reported to be 0.25%, according to Axcell et al.¹⁰, the prevalence is 0.57%.

Based on the analysis of the obtained clinical data, chronic fissures of the vermilion zone can be classified as primary and secondary (burdened). Primary chronic lip fissures are caused by local irritating factors: bad habits associated with licking, biting the lip, carelessness of exposed areas of the face during intense insolation, wind, frost, and individual anatomical features of the lip structure. These etiologic factors can be aggravated by smoking,

secondary infection with coccal and fungal microflora, somatic diseases: gastrointestinal pathology, neurogenic disorders, and allergic reactions. In this case, chronic lip fissure can be defined as burdened, persistent, and prone to relapse.

In this study, it was not possible to confirm the etiologic role of concomitant pathology in the development of chronic lip fissure.

By the depth of lesions, they are divided into superficial and deep ones. According to morphological features, an isolated chronic fissure is possible within the vermilion zone and with impaired integrity of the lower lip mucosa.

This study found the prevalence of chronic lip fissure among men - this can be explained by women's greater attention to their appearance, and in particular to the appearance of the lips, the use of lipstick, as well as working conditions (mainly indoors). These studies correlate with the data of Axell T, Skoglund A. et al.¹⁰ who reported a higher prevalence of this pathology in men than in women. According to Comebes et al.⁸ chronic lip fissure is more common in men than in women, in a ratio of almost 4:1.

In addition, in our case, these were men of the most active and able-bodied age up to 46 years. Most of them have occupations (e.g. drivers, builders, farmers, fishermen, military, etc.) that require spending long periods of time outdoors in adverse weather conditions (cold, wind, insolation). The vast majority of patients did not use face and lip protection, such as hats, scarves, masks, protective hygienic lipsticks or lip balms. Similar data were reported by Evans et al.¹⁴ The appearance of chronic lip fissuring was observed in winter with the onset of cold weather, which may be due to the drying and loss of elasticity of the outer stratum corneum of the lip epithelium. The occurrence of chronic lip fissuring has also been reported when playing wind instruments. According to Axcell et al.¹⁰, chronic lip fissures are more common in younger age groups.

The majority of cases of chronic lip fissure in our study are centrally located and occur on the lower lip. This is due to the prominent position of the lower lip and its maximum exposure to high insolation and chronic trauma from cigarette smoking. Our findings correlate with those of Melikoglu et al.³⁰ who reported a

predominant number of cases of chronic lip fissure on the lower lip also with a central location. Combes et al.⁸ reported approximately the same incidence of lesions on the upper and lower lip. Moreover, Axell et al.¹⁰ observed the predominance of chronic fissures on the upper lip.

According to Axell et al.¹⁰, the occurrence of chronic fissures is explained by the presence of areas of prenatal fusion of embryonic processes, the so-called *loci resistentiae minoris*. On the lower lip, they are located along the midline, and on the upper lip, two fissures are located eccentrically on each side of the lip. This anatomical feature may contribute to the chronic course of the lesion. Furthermore, Rosenquist et al.¹⁹ and Axell and Skoglund et al.¹⁰ hypothesized that this weakness of the fusion, in particular of the prenatal lateral segments of the lower lip, may be inherited and in some cases lead to a midline lip fissure. In our study, none of the patients had a family history of chronic lip fissure.

In assessing the course of chronic lip fissure, we observed mainly moderate lesions. According to our data, the cracks are quite long-lasting lesions in terms of the time of existence - from 2 to 7 years in most patients. This is confirmed by the observations of Combes et al.⁸, who reported a duration of several months to 7 years with recurrence periods of 1 to 5 times a year. Healing lasted from 2 weeks to several months, and there was no effect of treatment.

The clinical characteristics of a chronic lip fissure are largely associated with the duration of the course, so in longer-standing cases, there is an irregularity of the edges of the crack due to scar atrophy, elasticity is absent, there are yellowish, gray areas of thickening along the edges of the crack.

In addition, according to Rosenquist et al.²⁰, a chronic inflammatory infiltrate is noted on histologic examination. Axell et al.¹⁰ attributed the persistence of the fissure to the presence of numerous small salivary glands on the mucosa of the lower lip, which can produce saliva in the fissure and delay spontaneous healing. Rosenquist et al.¹⁹ attributed the prolonged existence of a chronic fissure to secondary infection with *Staphylococcus aureus* and *Candida*.

The present study also indicates an association between a lack of education and the occurrence of chronic lesions, and thus a lack of

patient's understanding of their harmfulness and the need for timely dental care. We explain this by the fact that dentists may not have emphasized the importance of treating chronic fissures and their relationship with existing bad habits. In addition, it cannot be ruled out that patients did not adhere to the treatment regimen. These study results are in line with the findings of Lipsky et al.²¹, who reported that male patients are less likely than female patients to visit doctors for a check-up and avoid dental care even if they have serious dental pathology. When they do seek dental care, it is typically in response to acute problems rather than for preventive care. Furthermore, the study suggests that women exhibit a higher tendency to adhere to recommended treatment plans following a dental examination.

In this study, there is an association between chronic trauma and the presence of a chronic lip fissure. This correlates with the findings of Kluemper et al.¹³ who reported a persistent crack on the upper lip that had not healed for 2 years next to a malpositioned tooth that protruded from the dentition. The researcher suggests that the etiologic factor is chronic mechanical irritation of the vermilion zone.

According to Girijala RL et al.²² self-injurious habits, namely biting and constant licking, caused by nervous instability, can cause dryness, peeling, cracking or fissuring of the lips and lead to exacerbation of existing conditions.

In our study, we noted the prevalence of chronic lip fissure in individuals with a lower level of education. Ureña-Paniego et al.¹¹ shows that socio-demographic factors are closely related to the overall well-being and physical condition of the individual and society. Socio-demographic factors, including employment status, household income, education level, marital status, and social support, are recognized as key determinants of many health outcomes, including healthy aging.

In our study, we found a significant association (direct correlation) between smoking habits and the presence of chronic lip fissure. This correlates with the findings of Balaji et al.²³ who clinically observed delayed healing of a lip ulcer in a male smoker. He provides evidence that tobacco is a peripheral vasoconstrictor that affects the rate of wound healing in the oral cavity. Carbon monoxide and other chemicals produced during tobacco combustion can reduce

capillary blood flow. A clinical study has shown that one cigarette can reduce peripheral blood velocity by 40% within one hour. According to Silenko Yu.I. et al.^{24,25} nicotine induces platelet aggregation, increasing the risk of microvascular occlusion and tissue ischemia. Smoking is associated with the release of catecholamines, which leads to vasoconstriction and decreased tissue perfusion.

Mirbod SM et al.²⁶ reported the observation of burns and keratotic spots on the lips at the site of habitual smoking, especially if the cigarette or cigar is stored as a cigarette butt for a long time.

Vellappall et al.²⁷ also noted a negative effect of smoking on the rate of wound healing in the oral cavity and suggested that the mechanism of impaired healing is likely related to increased plasma levels of adrenaline and norepinephrine after smoking, which leads to peripheral vasoconstriction, as well as impaired polymorphonuclear neutrophil function.

In our study, there was no association between alcohol consumption and the presence of chronic lip fissure.

The etiology and clinical features of the course of chronic lip fissure determine the methods of treatment.

All patients have a conversation about the need to eliminate bad habits - they are warned about possible complications and problems. The importance of following the doctor's prescriptions, intensifying personal hygiene, oral cavity sanitation, and timely treatment of somatic diseases is emphasized.

Conservative therapy is the first choice treatment. Among the products for topical treatment, there are antifungal and anti-inflammatory agents, benzocaine, camphor, petroleum jelly, retinyl palmate, tocopheryl acetate, aloe extract, and zinc acetate,¹³ diltiazem 2% Vaseline cream,²⁸ 1-2% silver nitrate, salicylic acid in Peruvian ointment, antimycotics, 3% Aureomycin'P cream and sulfonamides¹⁰, topical fusidic acid, steroid and antibacterial ointments.³⁰

However, conservative treatment is less effective than surgical treatment, as resistance to treatment and recurrence are observed. Thus, surgical intervention to excise the central part of the lesion together with Z-plasty,¹¹ cryotherapy, cutaneous resurfacing with carbon dioxide laser, resurfacing with carbon dioxide laser⁸, and

injections of botulinum toxin A to reduce muscle tone of the mentalis and orbicularis muscles have a satisfactory prognosis at the postoperative stage of healing of the excised recurrent lip fissure.²⁹

Conclusions

Prevention of chronic lip fissure involves the elimination of bad habits, oral cavity sanitation, adherence to personal hygiene practices, lip exercises, the use of protective creams and hygienic lipsticks that protect against sunlight and dust exposure.

Chronic recurrent lip fissure compromises lip functions, impacting speech, eating, and aesthetics. It causes discomfort, impedes epithelialization, and, in cases of recurrence, induces anxiety and affects overall quality of life.

The significance of this research relies on its role in disseminating crucial information among doctors and patients with chronic lip fissure about chronically persistent lesions, which, when coupled with other risk factors for premalignant diseases, can lead to malignancies (lip cancer).

Acknowledgements

This study was supported by the Department of postgraduate dentists' education, Poltava State Medical University, Ukraine.

Declaration of Interest

The authors report no conflict of interest.

References

1. Rogers RS 3rd, Bekic M. Diseases of the lips. *Semin Cutan Med Surg.* 1997;16(4):328-36.
2. Jaber M., Rama Varma S., Hassan M. et al. Assessment of lip print (cheiloscopy) patterns and its use for personal identification and crime investigation: A systematic review and Meta-Analysis *J Int Dent Med Res* 2023; 16(1): 331-339.
3. Berkovitz B. K. *Oral Anatomy, Histology and Embryology.* 5th ed. London, UK: Elsevier; 2018: 472.
4. Almeida, Manuella Santos Carneiro, et al. International Classification of Diseases–11th revision: from design to implementation. *Revista de Saúde Pública,* 2020; 54: 104.
5. ICD-11 International Classification of diseases 11th Revision Available at: <https://icd.who.int/browse11/l-m/en#/http://id.who.int/icd/entity/134590150> Accessed October 1, 2023
6. Roy S Rogers, Marina Bekic Diseases of the lips. *Seminars in Cutaneous Medicine and Surgery* 1997; 16(4):328-36.
7. Brad W. Neville, Douglas D. Damm, Carl M. Allen et al. Physical and Chemical Injuries. In: Brad W. Neville, Douglas D. Damm, Carl

- M. Allen, eds. *Color Atlas of Oral and Maxillofacial Diseases,* Philadelphia: Elsevier; 2019: 169-203.
8. Combes J, Mellor TK. Treatment of chronic lip fissures with carbon dioxide laser. *Br J Oral Maxillofac Surg* 2009; 47(2):102-5.
9. Rashid N, Yusuf H. Median lip fissures and their management. *Int J Oral Maxillofac Surg* 1997; 26(4):299-300.
10. Axéll T, Skoglund A. Chronic lip fissures. Prevalence, pathology and treatment. *Int J Oral Surg* 1981; 10(5):354-8.
11. Ureña-Paniego C, Soto-Moreno A, Haselgruber S, et al. Surgical Treatment of Chronic Lip Fissure with Z-Plasty Repair. *Actas Dermosifiliogr* 2023;114(8):725-27.
12. Lugović-Mihčić L, Pilipović K, Crnarić I, et al. Differential Diagnosis of Cheilitis - How to Classify Cheilitis? *Acta Clin Croat* 2018;57(2):342-51.
13. Kluemper GT, White DK, Slevin JT. Chronic fissural cheilitis: a manifestation of anterior crowding. *Am J Orthod Dentofacial Ortho* 2001;119(1):71-5.
14. Evans CD, Hight AS. Staphylococcal infection in median fissure of the lower lip. *Clin Exp Dermatol* 1986;11(3):289-91.
15. Scully C, van Bruggen W, Diz Dios P, Casal B, Porter S, Davison MF. Down syndrome: lip lesions (angular stomatitis and fissures) and *Candida albicans.* *Br J Dermatol* 2002;147(1):37-40.
16. Yenidünya MO, Emsen IM, Ozdengil E. Median lower lip fissure. *Plast Reconstr Surg.* 2001;107(3):888-9.
17. Skrypnikova, T. P., Khmil, T. A., Pysarenko, O. A., & Bieliaieva, O. M. On the issue of clinical classification of precancerous changes in the oral mucosa and the lips. *Ukrainian Dental Almanac* 2022; 3: 9-13.
18. Greenberg SA, Schlosser BJ, Mirowski GW. Diseases of the lips. *Clin Dermatol* 2017;35(5):1-14.
19. Rosenquist B. Median lip fissure: etiology and suggested treatment. *Oral Surg Oral Med Oral Pathol* 1991;72(1):10-4.
20. Rosenquist BE. Median lip fissure. *J Craniofac Surg* 1995;6(5):390-1.
21. Lipsky MS, Su S, Crespo CJ, et al. Men and Oral Health: A Review of Sex and Gender Differences. *Am J Mens Health* 2021;15(3):155-7.
22. Girijala RL, Falkner R, Dalton SR, Martin BD. Exfoliative Cheilitis as a Manifestation of Factitial Cheilitis. *Cureus* 2018;10(5):2565.
23. Balaji SM. Tobacco smoking and surgical healing of oral tissues: a review. *Indian J Dent Res* 2008;19(4):344-8.
24. Silenko lu.I. Effect of tobacco smoke on the antiaggregation activity of the gingiva. *Stomatologija (Mosk)* 1988;67(5):15-16.
25. Tarasenko LM, Silenko lu.I., Salienco OV Antiaggregation activity of periodontal tissues in acute emotional pain stress. *Stomatologija (Mosk)* 1985;64(5):12-3.
26. Mirbod SM, Ahing SI. Tobacco-associated lesions of the oral cavity: Part I. Nonmalignant lesions. *J Can Dent Assoc* 2000;66(5):252-6.
27. Vellappally S, Fiala Z, Smejkalová J, Jacob V, Somanathan R. Smoking related systemic and oral diseases. *Acta Medica (Hradec Kralove)* 2007;50(3):161-6.
28. Juch, R. N. S., Janse, I. C., & Bousema, M. T. Chronische fissuur van de lip: behandeling met diltiazem crème. *RC Beljaards Neds Tijds voor Derm en Ven* 2021; 31(1): 18-9.
29. Farrier, J. N.; Beech, A. N. The use of botulinum toxin A to promote wound healing in a recurrent lip fissure. *Oral Surgery* 2019;12 (1): 35-7.
30. Melikoglu C, Eren F, Kok D, et al. Management of median lower lip fissures. *Dermatol Surg* 2013;39 (1):121-2.