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ORAL PIERCING IS A NEW CHALLENGE IN THE DENTISTRY

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Ключевые слова: *пирсинг полости рта, пирсинг языка, пирсинг губ, осложнения, анкетирование, студенти-стоматологи*

Abstract. Oral piercing is a new challenge in the dentistry. Samoilenko A.V., Orishchenko V.Yu., Strelchenia T.N., Strelchenia O.V. *The number of the young adults undergoing oral piercing is increasing worldwide. Oral piercing leads to numerous complications, and it is possible that the incidence of complications may increase as the prevalence of oral piercing rises in Ukraine. However, not everyone is aware of its potential risks, local and systemic complications shortly after, or long after the piercing procedure. Dentists should educate patients with oral*

piercing or those who plan to have this type of body art performed about potential side effects and possible oral, dental, and systemic complications. However, data related to these complications in Ukrainian literature are limited. The purpose of this study – to assess the potential complications of the oral piercing; and to analyze awareness about the actual health risks linked to the practice of oral piercing by dental students. This study includes 37 cases of oral piercing in 36 young women attending the department of therapeutic dentistry of Dnipropetrovsk medical academy with and without complaints. The average subjects age was 22,3 years. Patients were examined clinically and radiographically. 200 students of Dnipropetrovsk medical academy answered a questionnaire about oral piercing knowledge. Immediate complications of oral piercing included pain (58.3% of cases), oedema (47,2%) and bleeding (11.1%) as the most representative. Prolong time of piercing wearing is associated with a greater prevalence of complications. Dental fractures or fissures (35,1%), gingival recession (29,7%) and mucosal atrophy (21,6%) are the most representative. The accumulation of dental plaque and calculus on piercing elements (43,2%) was an additional risk of infection. The results of the survey showed a high level (85,4%) of awareness of dental students about local oral piercing risks. At the same time, dental students (50,6%) are not sufficiently aware of the risk of piercing on developing systemic complications. Approximately 60% of dental students do not have a negative attitude towards the new practice of oral piercing.

Реферат. Пирсинг полости рта – новый вызов в стоматологии. Самойленко А.В., Орищенко В.Ю., Стрельченя Т.Н., Стрельченя О.В. *Популярность пирсинга полости рта среди молодых людей растет во всем мире. Пирсинг полости рта приводит к многочисленным осложнениям, частота которых будет увеличиваться по мере роста его распространенности в Украине. Тем не менее, не все знают о его потенциальных рисках, местных и системных осложнениях, развивающихся вскоре после или намного позже после процедуры пирсинга. Стоматологи должны быть готовы информировать носителей орального пирсинга или тех, кто только планирует сделать этот вид боди-арта, о потенциальных побочных эффектах и возможных оральных, стоматологических и системных осложнениях. Однако в отечественной литературе данных об осложнениях пирсинга полости рта явно недостаточно. Цель исследования: изучение возможных осложнений пирсинга полости рта; анализ осознания выпускниками-стоматологами угрозы для здоровья орального пирсинга. Обследовано 36 молодых женщин с пирсингом полости рта (37 случаев), обратившихся на кафедру терапевтической стоматологии Днепропетровской медицинской академии. Средний возраст пациентов составил 22,3 года. Все пациенты клинически и рентгенологически обследованы. Проведено анкетирование 200 студентов Днепропетровской медицинской академии на предмет их знаний о пирсинге полости рта. Непосредственные осложнения орального пирсинга включали боль (58,3%), отек (47,2%) и кровотечение (11,1%) как наиболее характерные. Отдаленные осложнения были связаны с локализацией пирсинга и регистрировались в 81,1% случаев. Длительное время ношения пирсинга увеличивает распространенность осложнений. Чаще всего наблюдались отколы и трещины зубов (35,1%), рецессия десен (29,7%) и атрофия прилежащей слизистой оболочки (21,6%). Отложение мягкого и твердого микробного налета на элементах пирсинга (в 43,2% случаях) несло дополнительный риск инфицирования. Результаты опроса студентов показали, что 85,4% студентов-стоматологов осознают местный риск орального пирсинга, тогда как 50,6% студентов-стоматологов недостаточно осведомлены о влиянии пирсинга на развитие системных осложнений. Около 60% студентов-стоматологов не имеют стойкого негативного отношения к новой практике пирсинга полости рта.*

The popularity of piercing the oral tissues, followed by the wearing of “ornaments”, namely oral piercing, became popular in the mid-2000s, when this form of body modification became widespread in Western Europe and America [9]. In Ukraine, oral cavity piercing "came" with some delay, so scientific experience regarding oral piercing is only emerging [2-5].

A 2012 study in Britain, Brazil, Spain, Israel, the US, New Zealand, Germany and Finland found that the prevalence of oral piercings varied from 0.8% to 12% among young people (5.2% on average), and more often tongue piercing (5.6%) was observed, followed by lip piercing (1.5%), cheek and gum piercing (0.1%) [10].

Oral tissues due to an extensive vascularization network and features of innervation are extremely vulnerable to complications – from minor to extremely severe, potentially life-threatening.

Reports of foreign researchers on the frequency of complications of oral piercing vary. Thus, Vieira EP and co-authrs [15] observed piercing complications in 97.6% of cases, whereas, according to Hickey BM and co-authrs [11], the negative effects of targeted impairment of the normal anatomy of the oral cavity were recorded in only 23.4% of cases.

Due to the variety of oral piercing complications cited in the literature, some authors attempt to systematize them into acute and chronic, immediate and delayed, early and late, direct and indirect, local

and systemic, direct and remote, non-infectious and infectious but a unified classification of complications is missing.

Many specialists [4, 13, 15] point to local manifestations associated with pain, bleeding and swelling of the tissues up to the obstruction of the airways during tongue piercing in the first day after piercing. Over the next few weeks, these problems are accompanied by functional problems (dysphagia, dysphonia, dysgeusia, chewing disorders, etc.).

Among the systemic complications such rare and threatening diseases as infectious endocarditis, brain abscess, Ludwig's angina, thrombophlebitis of the sigmoid sinus are of concern [4, 9, 13].

Piercing can be a serious risk to life. Following the death of a teenager in 2002 due to sepsis, which developed shortly after the tongue piercing, the British Dental Association (BDA) has released a statement recommending to avoid piercing. Since 2015, tongue piercing, currently listed as intimate piercing, is allowed in the UK and some US states only after the age of 18 [12].

Patients with oral piercings are at risk for hemocontact infections such as hepatitis B, C, D, and HIV. Inadequate methods of sanitary control over piercing significantly increase the risk of infectious transmission of C. tetani, T. palidum, M. tuberculosis [13].

Immunocompromised patients need special tactics. Rheumatic heart disease, hypertrophic cardiomyopathy, mitral valve prolapse with murmurs and calcification have been cited by the researchers [12, 13] as factors that cause systemic infectious risks of oral piercing and may threaten long after piercing procedure.

Due to the difficulty of hygiene, the piercing site creates an ideal environment for the accumulation of microbial biofilm. It is proved that the perforation canal is a zone of high contamination and a potential reservoir for Staphylococcus aureus, streptococci gr. A, Pseudomonas aeruginosa, Erysipelas, β-hemolytic streptococci, periodontal pathogens, fungi of the genus Candida [7, 16]. In addition, the “ornament” itself due to micro-roughness becomes a retention field for microorganisms. The constant movement of the piercing rod does not exclude the implementation and the prevalence of microbial content in the surrounding tissue.

In addition to the infectious danger, undesirable local and systemic effects are associated with the constant finding of "decoration" in the oral cavity, which acts as a mechanical, chemical and physical irritant at the same time.

Long-term local complications are atrophy or hypertrophic-keloid lesions of soft tissues, fibroma, necrosis of adjacent tissues with subsequent ingrown of "decorations", traumatic ulcer, gum recession, periodontitis, mechanical damage of hard dental tissues, teeth hypersensitivity, chronic inflammation of palate mucosa, paraesthesia and atypical trigeminal neuralgia, diastema, splitting of the tongue, excessive salivation, sialodenitis, etc. [4, 5, 9, 10, 11, 12, 13, 15].

Piercing ingredients cause worry as they result in allergic contact dermatitis (most commonly due to nickel or cobalt), galvanosis, etc. Thereby, in 2001, a law was adopted in the EU countries to limit nickel content to 0.05% in articles which are in prolonged contact with the skin, and since 2004 this parameter was changed to $\leq 0.2 \mu r/cm^2$ [8, 14]. To avoid this complication, the piercing material should be titanium, niobium, yellow gold ≥14 carats or stainless steel.

Certainly, oral piercing is a new challenge for domestic dentists. It is impossible to provide qualified help and preventive work without having certain knowledge of the oral piercing problem.

Thus, the increasing popularity and prevalence of oral piercing and the variety of local and systemic complications caused urgency of the research.

The aim of the study:

1. The study localization, structure and prevalence of complications of oral piercing, varieties of "decorations".

2. Analysis of awareness of dental graduates of the dangers of oral piercing.

MATERIALS AND METHODS OF RESEARCH

In the first (clinical) phase of the study, we examined 36 patients with 37 cases of oral piercing. All patients were women aged 18 to 32 years (mean age – 22.29±1.5 years), who sought medical and consulting assistance at the Department of Therapeutic Dentistry of the State Establishment "Dnipropetrovsk Medical Academy of Health Ministry of Ukraine". Each patient signed an informed consent to be included in the study.

The anamnesis was collected with an emphasis on the following issues:

- motivational reason for piercing;
- independence of decision-making on piercing;
- when, where and who performed piercing procedure;
- immediate effects of piercing;
- presence of bad habits associated with piercing;
- volume of hygienic care for the piercing bed and "decoration".

All patients were examined for long-term local complications of oral piercing by traditional clinical methods, vital staining was performed using a Schiller-Pisarev sample and a toluoid (T-blue) test [1]. The radiological picture of the surrounding dental tissues was studied with the help of intraoral radiographs and orthopantomograms. Photo documentation was done using an intraoral shooting with mirror chamber Canon (MacroRing lite MR-14EX) and mirrors dent-o-care, Filtrop

In order to achieve the second goal, two groups of students (n=200) of the SE "DMA" were interviewed using the questionnaire prepared by us. The survey was anonymous and aimed to examine a general attitude to oral piercing, the awareness of the threat of oral piercing to general and local health, the desire and motivation to have oral piercings.

The I (core) group included 89 graduates of dentistry who were knowledgeable in professional matters. The comparative analysis was performed with the answers of the 1st – year students of the Ist Faculty of Medicine (n=111), who made up II (control) group – uninformed youth in professional matters. All respondents participated in the survey on a voluntary basis.

The processing of the study results was carried out by conventional statistical methods [6].

RESULTS AND DISCUSSION

The tongue was chosen for piercing 3.1 times more often than the lips, and usually was pierced in the middle third. We also observed 5 (13.5%) cases of tongue frenulum piercing. The main type of "decoration" of tongue piercing in our patients - a barbella, which consists of a rod and two balls, one of which is fixed steady-state, the other, if necessary, rotates.

Lips piercing was observed in 24.3% of cases. In all women, it was performed laterally from the center of the lip, near the corner of the mouth, and 2.5 times more often "decorated" the upper lip than the lower lip. The "decoration" of the lips - the labret, on one side (periorally) has a jewelry insert, on the other (intraorally) - coupling flat plate contacting with the mucous membrane. In 2 (5.4%) of women in frenulum of the upper lip the "decoration" was in the form of a ring.

There were no observations of cheeks or gums piercing in our study.

In 78.3% of cases the "decoration" was metallic, in the latter cases (mainly labrets) – combined with non-metallic elements.

Most women had one oral piercing, only one woman (2.8%) in our study had tongue and upper lip piercing, as opposed to foreign studies in which the number of patients with piercing of more than one area made up 5% – 14% [9, 13].

The average duration of oral piercing wear was 24.11±0.7 months. Six women had piercing made by the age of 18.

Regarding the reasons that impelled to do oral cavity piercing, the surveyed noted the following: for the sake of fashion (44.4%), desire to distinguish oneself (38.9%), improvement of aesthetics (29.7%), imitation of someone he/she knows (13.5%), a form of protest (10.8%), for sexual needs (5.4%). Other answers are: *"fighting with own complexes", "improving English pronunciation", "to support a girlfriend"* and so on.

Twenty-five women made decisions as for piercing on their own, while 30.6% consulted with friends, husbands, and parents. This information can be of help for determining preventive steps to avert this type of body art.

55.6% of women underwent piercing procedure in a beauty salon / tattoo studio, where they were not warned about any further risks, or got information with a certain proportion of incompetence. One case of piercing was performed by a cosmetologist. The percentage of women who made piercing on their own was twice as high as reported by foreign researchers (41.7% and 20%, respectively) [13].

Most patients considered piercings a common attribute of daily life and completely denied the impact of piercings on overall health. Local risk was admitted by 19.4% of women, including 3 women who regretted about piercing in the past.

All patients noted complications of piercing that developed immediately after the piercing procedure – pain (58.3%), swelling (47.2%), bleeding (11.1%), impaired breathing, chewing, swallowing. According to the women, the healing of the tongue lasted from 4 to 6 weeks, piercing of the lip healed more slowly – within 1-2 months.

Parts from case histories of female patients are given as an example:

Patient M., aged 22 years, together with a girlfriend at the age of 15 years at home, secretly from the parents, pierced the tongue twice because they could not put on "decoration", then for a long time tried to cope with bleeding on their own, despite the fact that the girl even was losing consciousness.

Patient O., aged 19 years, underwent a tongue piercing procedure in a tattoo studio where she was not informed about possible effects of piercing. In the evening, the swelling of the tongue was so severe that the girl could not breathe freely, this caused panic fear. The temperature rose to 39oC.

She was taken to the hospital *by ambulance* where the “decoration” was removed, the patient was hospitalized and administered a course of antibiotic therapy.

In 30 (81.08%) of cases on objective examination we observed long-term local complications, in the structure of which the localization and duration of piercing wear played a decisive role.

The adverse consequences of piercing are primarily related to its mechanical impact on tissues that come into contact with the "decoration".

In 19.4% of cases our patients complained of increased tooth sensitivity. Four of them noted unsatisfactory aesthetics of a smile at the expense of the exposed necks and roots of the teeth, which was confirmed by objective examination. In 6 cases of lip piercing on the background of pale pink gums, gums recession was observed in the area of incisors and premolars from the vestibular surface. In tongue piercing in 5 cases recession was determined in the area of the central incisors from the lingual surface. According to Miller's classification, we have identified 9 cases of recession of the 1 class and one case of the 2 and 3 classes. X-ray signs of the interdental septum resorption in recession of 1-2 class were not revealed, whereas in recession of the 3 class, permanent trauma caused by the metal elements of the piercing led to a localized horizontal loss of the interalveolar bone. The recession was on average 1.9±1.16 mm. All patients with gum recession have been wearing piercing more than 2 years.

If barbells were not always in direct contact with the marginal gums of the lower incisors but only at its length of more than 1.5 cm, then the labrets acted as a traumatic factor regardless of the length of the “decoration”. Therefore, lip piercing is of the the greatest threat to periodontal tissues (Photo 1).

Photo 1. Correlation of labret and gums recession in patient Z., 27 years (3 years of piercing wear)

In the examined patients, inflammatory periodontal diseases were absent, which suggests that the negative effect of the piercing on the periodontal tissues consists in the transmission of mechanical pressure of the tongue muscles or the contractile activity of mimic muscles of the lips through the elements of piercing on the contacting tissues, with subsequent morphologic changes – disorder of microcirculation, development of ischemia and atrophy.

In 21.6% of cases, we observed atrophy of the soft tissues of the piercing bed, which was accompanied by the formation of a lesion area that completely repeated the geometry of the "decoration" (Photo 2).

Tissue growth around the puncture site was more commonly observed only in tongue piercing from its ventral surface (in 16.2% of cases) (Photo 3, 4).

Photo 2. Atrophy of tissues contacting with barbell, patient S., aged 21 years (5 years of piercing wear)

In tongue piercing we revealed one case of benign tumor – fibroma, which was confirmed by negative staining with 1% solution of toluidine blue and histological examination after its removal (Photo 5).

Photo 3. Tissue growth in the area of perforation hole of tongue piercing, patient Yu., aged 23 years (9 months of piercing wear)

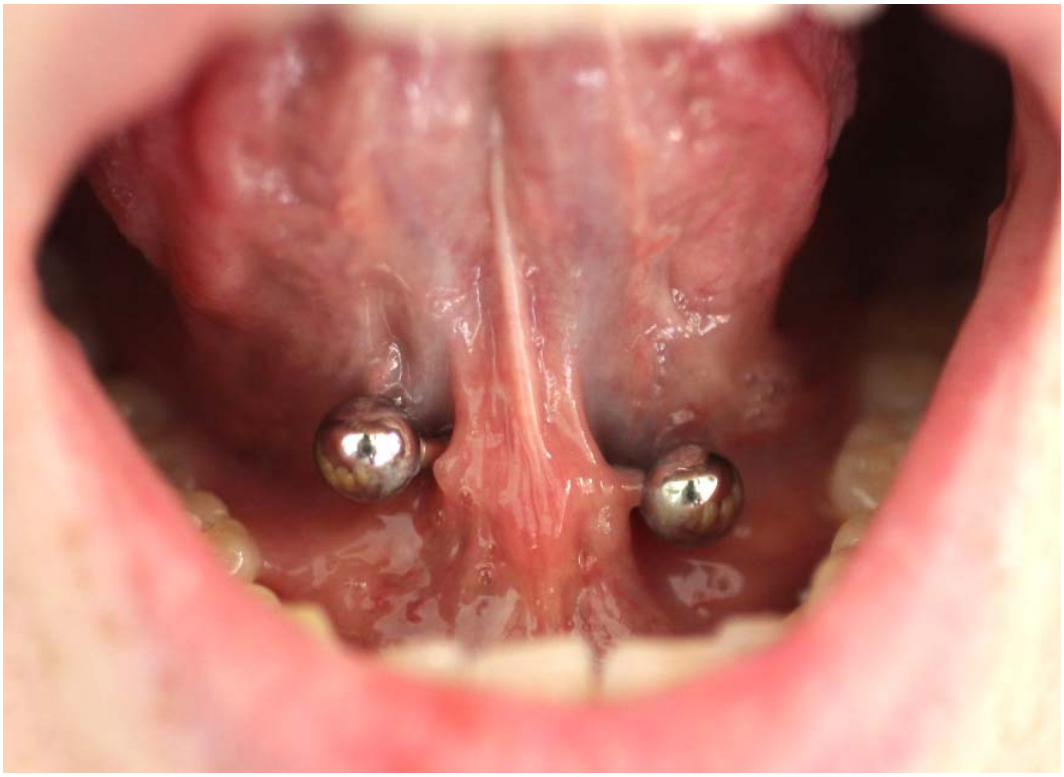

Photo 4. Tissue growth of the tongue frenulum in the piercing site of patient T., aged 30 years (4.5 years of piercing wear)

In 4 (10.8%) of women with lip piercing we noted maceration of the skin in the puncture site, possibly due to leakage from the perforation of the saliva canal, 16.7% of women noted its increase as compared to the period before “decoration” wear.

Photo 5. Traumatic fibroma and atrophy of the mucous membrane due to tongue piercing, patient D., aged 22 years (6 years of piercing wear)

Traumatic damage to the teeth in most cases was limited by damage to the enamel, once – to dentin, and in no case - to the pulp. The splitting and numerous cracks of the central incisors and oral tubercles of the molars were noted in 13 (35.1%) of 37 cases, entirely in tongue piercing with prolonged wear of the latter (Photo 6).

Photo 6. Traumatic injury of 2.6 tooth with subsequent tooth stopping, patient U., aged 23 years (6 years of piercing wear)

Most often, in 69.2% of cases aesthetically important teeth - central incisors got under blow.

In addition to being in a constant risk zone while talking and chewing, the teeth were also damaged due to bad habits related to piercing. Two-thirds of women enjoyed the “game” with piercing - biting, touching, pulling "decoration" between their teeth (Photo 7).

Three patients swallowed piercing as a result of loose fixation of its elements.

Photo 7. Traumatic injury of 1.2, 1.1, 2.1 teeth as a result of “playing” with tongue piercing, patient P., aged 26 years (3.5 years of piercing wear)

Another potentially significant risk factor is the presence of both mineralized and mild microbial plaque on the piercing, which was determined in 43.2% of cases (Photo 8).

The plaque was mostly accumulated on the finite elements of the piercing because no woman carried out special hygienic care and was not taught how to do it (Photo 9).

Photo 8. Accumulation of microbial biofilm and mineralized deposits on the "decoration" due to difficulties in carrying out oral hygiene and retention of debris, patient O., aged 20 years (1 year of piercing wear)

Photo 9. Corrosion of metal barbel components due to changes in local pH in accumulating microbial biofilm (5 years of piercing wear)

We also noted the presence of more pronounced dental deposits on the side of lip piercing location, due to difficulties in carrying out daily oral hygiene.

"Decoration" also contributed to the distorsion of the x-ray image (Photo 10).

In order to prevent further damage to the tissues of the oral cavity, all patients were advised to get rid of "decorations".

According to the results of students' questioning, only 40.4% of dentists expressed a general negative attitude towards piercing of the oral cavity, while students of group II negatively assessed this phenomenon in 54.1% of cases. 44.9% of dentists could not make their minds relatively intentional derangement of general anatomy of the oral cavity, ticking the answer "I do not know", and 13.5% of dentists in general had a positive attitude to the oral piercing, 1.12% of respondents gave their answer as "indifferent".

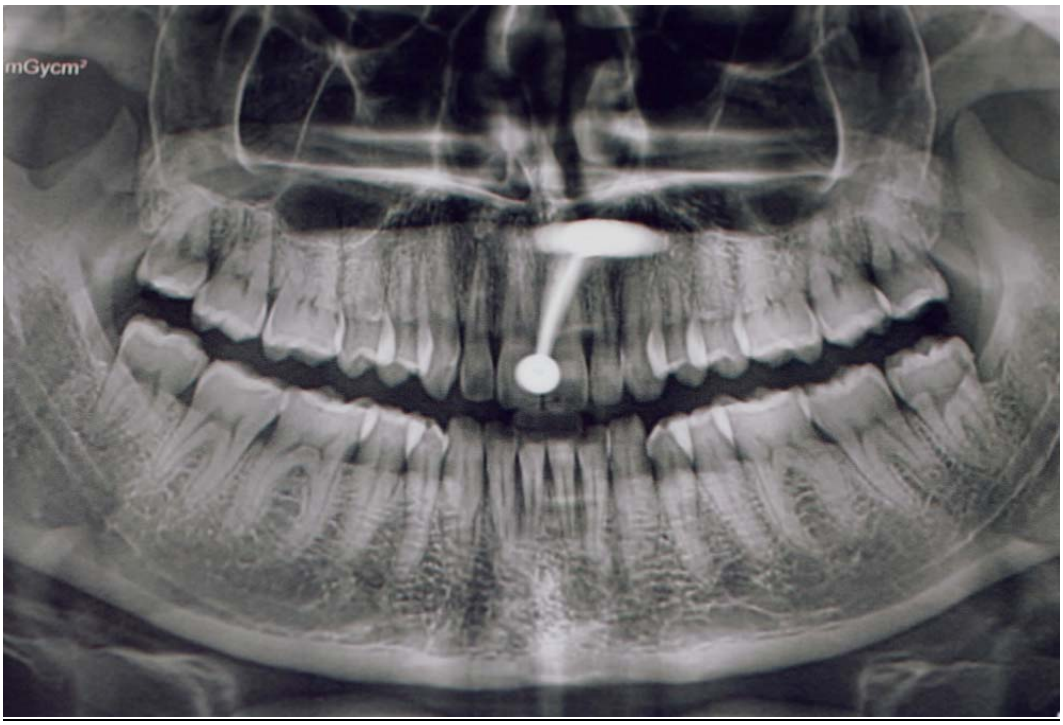

Photo 10. X-ray distortion in tongue piercing

Future dentists and newcomers to medicine had roughly the same views on awareness of the risk of oral piercing for general health (49.4% of dentists and 49.5% of physicians). 19.1% and 20.7% of students, respectively, identified it as safe. However, group I respondents were twice as likely as group II students to determine if piercing was affecting overall health, and did not know.

Professional knowledge helped 85.4% of dentists to answer the question about the local danger of piercing. For reference, 70.3% of students of group II also assumed local harm of the oral piercing. In this regard, 12.4% of dentists answered "I do not know", and 1.1% of graduates generally rejected its local risk.

According to the answers to the direct questions of the anonymous questionnaire "Do you have tongue, lip or cheek piercing?" and "Would you like to do tongue, lip or cheek piercing?" it was found that dental students were almost twice as likely to have oral piercing (3.4% of respondents) than first-year students (1.8%) and by 1.3 times more likely to do so in the future (7.9% and 5.4%, respectively).

Despite the fact that most respondents identified the phenomenon of "piercing" as drawing attention to oneself, students of both groups (90.5% on average), fortunately, did not want to have oral piercing, which suggests that this form of drawing attention in the system of personal values and priorities is not decisive for our respondents.

Thus, summarizing the results of the study, it is advisable to emphasize the high prevalence of complications of oral piercing – 81,1%, which confirms the data of Vieira EP et al. [15]. Prolonged wearing of "decoration" increases the likelihood of negative effects of the piercing.

In one third of all cases (35.1%) oral piercing was dangerous for the hard dental tissues being in contact with the "decoration". Bad habits related to piercing also contributed to tooth injuries, as noted

by 72.2% of those surveyed. With lower frequency we observed gum recession (29.7%) and atrophy of the soft tissue adjacent the "decoration" (21.6%). Tissue hypertrophy in the piercing site was determined in 18.9% of cases, in one of which fibroma was diagnosed. This result is consistent with the results of studies on the effects of oral piercing [9, 10, 11, 13, 15].

The tongue piercing most often caused cracks and breaks of the teeth, the likelihood of which increased with the lengthening of the "decoration" rod of more than 1.5 cm, and hypertrophy of the soft tissues in contact with the piercing. Lips piercing was a major cause of gum recession. Equally, both in tongue and lip piercing, atrophy of soft tissues, increased sensitivity of teeth, accumulation of microbial deposits on the "decoration", increased salivation were observed.

It is worth noting that our study did not address the effects of piercing material on the tissues of the oral cavity and the possibility of tissue oncotransformation under conditions of permanent polytrauma.

Our research confirms that women were more likely to be body piercing lovers. The main reason for oral piercing was following fashion trends (44.4%) and emphasizing one's personality (38.9%), which was not significantly different from foreign studies [12]. Unlike foreign studies, we have never seen piercings with localization in the cheeks, gums, soft palate. Only one patient had tongue and lip piercing at the same time, which made up 2.7%, while in the research of Hennequin-Hoenderdos NL and co-authors [9] Plastargias I., Sakellari D. [13] this figure ranged between 5 and 14%.

A high percentage (41.7%) of prevalence of direct complications of piercing in our study is explained by twice more frequent piercing procedures made in the home as compared with the data of Plastargias I., Sakellari D. [13]. The frequency of late complications of piercing did not depend on the professional or household technique of performing piercing procedure.

In the course of students' questioning it was found that the majority (85.4%) of future dentists were well aware of the local risk of piercing, which significantly differentiated them from freshmen. But in the answers regarding the general harm of piercing dentists did not differ from the new to medicine and in the same way, only in 50% of those ones gave an affirmative answer. Almost 60% of future dentists were not critical of oral piercing, which, in our opinion, is due not only to the lack of information on the danger of oral piercing, but also due to the lack of competence formed in this group to act on the basis of ethical considerations (motives). for safety and health-saving behavior.

CONCLUSIONS

1. Late local complications of oral piercing were observed in 81.1% of cases. Oral piercing was significantly associated with the risk of traumatic damage to the hard dental tissues (35.1%), gum recession (29.7%), soft tissue atrophy (21.6%). The accumulation of microbial plaque on the "decoration" in 43.2% of cases presented additional risks of local and general infection.
2. Graduates of dentistry were not sufficiently aware of the negative health effects of oral piercing. Half (50.6%) of dentists did not consider oral piercing to be hazardous to overall health, and nearly two-thirds (59.6%) of students did not have a clear negative attitude toward this risky behavior.

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