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Oral piercing - a form of body art or a danger to human health? A literature review

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Abstract

Introduction and purpose

Over the years piercing has become popular as a form of art and self-expression that may concern various areas of the body. However, it may pose significant risks to health. This literature review aims to provide insight into the matter of oral piercing and to examine recent studies investigating the implications of oral piercing on health. It emphasizes the necessity of promoting education regarding this matter and points out the most significant preventive measures such as regular dental examinations and maintaining proper hygiene that should be taken to minimize the negative consequences of oral piercing on health.

The state of knowledge

According to the examined studies investigating the implications of oral piercing on health, a wide range of complications have been reported. Gingival recession, damage to dentition and gingivitis should be mentioned among the most frequently discussed. Moreover, studies have demonstrated a correlation between the severity of complications and the location of the piercing, specifying the adverse effects of the piercing within lip and tongue areas in particular. They have also underscored the impact of prolonged wear time on the risk of complications, indicating the elevated risk associated with extended periods of wear time.

Conclusions

To minimize adverse effects of oral piercing on health, it is crucial to underscore the role of proper education in this field and the importance of taking preventive measures such as performing the piercing procedure by well qualified professionals who endure sterile work conditions and maintaining proper aftercare of the ornament. The role of regular dental examinations taken in order to detect and treat potential complications at early stages is also vital.

Key words: complications; dental education; oral health; oral piercing; prevention; systematic review

Materials and Methodology: The review is based on the analysis of the materials selected from “PubMed” and “Google Scholar” scientific databases using the following key words: complications, dental education, oral health, oral piercing, prevention; systematic review. These key words were selected based on their relevance to examining the influence of oral piercing on human health.

1. Introduction

The practice of piercing has been known since ancient times (1). It has tribal origins as people used it as a form of body decoration, a part of cultural rituals as well as to emphasize one's belonging to a certain tribe or ethnic group. Through the centuries the practice of piercing has remained, and it has become quite popular especially among adolescents and young adults (2, 3).

Some consider it as an aesthetic form of jewelry and body art, while for others it is a great tool for self-expression which helps to make a statement, distinguish themselves from the masses and bring their individuality out (4, 5). The results of a study conducted by Covello et al. (6) in which 387 selected individuals have taken part indicate the most common reasons for piercing, among them aesthetics as the main reason to get piercing for 43,9% medical subjects, expressing the individual personality for 30,2%, erotic reasons for 13,2%, making a fashion statement for 11,6%, and deciding under influence of friends for 1%. However, regardless of the reason behind the decision, it is essential to consider a wide range of factors prior to making a determination regarding piercing, for example, associated potential risks and complications, the selection of highly qualified professionals to perform the procedure and the acquisition of comprehensive knowledge regarding the appropriate maintenance and hygiene procedures.

This review will provide an insight not only into the aforementioned, but also into other vital aspects regarding the subject matter in question.

The state of knowledge:

Piercing- definition, most common locations and types

By definition, body piercing is the penetration of ornaments into openings made in the skin or in mucosa. It may concern various areas of the body, most commonly ear lobes, helix of the ear, nose, navel, nipples, eyebrows and genitals (1, 2). However, intraoral and perioral areas are also often chosen for piercing and these areas will be taken into consideration in this review.

Among the most prevalent locations tongue, cheeks and lips can be distinguished, less frequently frenum and the dorso-lateral side of the tongue. Piercing of the uvula is also practiced yet rarely due to associated difficulties of the procedure as well as potential complications including throat irritation, dysphagia and nausea (7, 8).

There are several kinds of oral piercing. Perioral is the one where one end of the piercing jewelry penetrates the skin surface while the other end is situated in the oral cavity, for instance a lip ring, whereas intraoral piercing is defined as a procedure where both ends of the piercing jewelry are situated within the oral cavity. This may include, for instance, tongue or uvula piercing (9). There are several kinds of oral jewelry, and they can be chosen individually based on personal preferences, size and shape of the ornament as well as a particular area of the body. The most common types of ornaments include barbells consisting of either straight or curved metallic stem with spheres located at each end. They are used especially as tongue piercings. A popular modification of a barbell is labret for which a smooth flat disc instead of one of the spheres is characteristic. Another commonly used type of oral jewelry is a ring with one or two spheres on each end. All these three types may be used for lip piercing (10, 11, 12, 13). Ornaments are prevailingly made of various metals such as gold, stainless steel, titanium or metal alloy (14), nevertheless synthetic materials like plastic, Teflon or nylon are also used in production (15).

Complications caused by oral piercing.

Both perioral and intraoral piercings may lead to various complications which differ depending on the location of the ornament, hygiene, habits and duration of wear time. A study conducted by Plessas et al. (16) who investigated the prevalence of dental and periodontal issues in a group of 110 patients with tongue or lip piercings indicated that specific habits such as rolling or biting the ornament and additionally extended periods of wearing time contributed to more frequent

adverse effects such as loss of the attachment, tooth chipping and gingival recession. A greater risk was associated with tongue piercing due to its constant contact with teeth.

Complications arising from oral piercing may be divided into local and systemic. They may occur during the piercing procedure or immediately after (primary postoperative). Long term complications (secondary postoperative) have been also reported (17).

Local complications of oral piercing

Periodontal complications:

Among the most frequent periodontal complications either localized or generalized gingivitis have been widely reported as the ornament constitutes an additional plaque retention recess, and the hygiene is commonly not sufficient enough. The correlation between those aspects was presented in the study by Covello et al. (6), which indicated that 44% of medical subjects suffered from localized gingivitis, 42% experienced generalized gingivitis, and 14% had no gingival inflammation diagnosed. The majority of 52,8% of medical subjects presented insufficient oral hygiene conditions. Furthermore, oral piercings may lead to the development of diverse oral lesions such as ulcers, mucocèles and inflammatory fibrous hyperplasia (18), horizontal bone loss as well as bone dehiscence (19). Another well documented periodontal complication is gingival recession. Singh et al. (19) found that lip piercings were often correlated to the recession on the vestibular surfaces of the lower incisors and often led to attachment loss as well as mucogingival defects. Additionally, Plessas et al. (16) noted the fact that gingival recession was inextricably linked to the longevity of wear time suggesting that the longer one wore the ornament, the more prone one was to this periodontal complication. In a study conducted by Lopez-Jornet et al. (20) the issue of gingival recession has also been underscored as 23,5% of medical subjects have suffered from this adverse effect of oral piercing. The majority of cases were observed on the buccal aspect of the lower incisors, and they were related to lip piercing in particular.

Dental complications:

Oral piercing may also become a cause of damage to the dentition such as abrasion and fracture due to mechanical irritation by the ornament, as well as tooth malposition caused by a constant pressure of the piercing on adjacent tissues (10, 21). According to a study by De Moor et al. (22), who conducted a survey on 50 patients with tongue and lip piercings, the risk of tooth fractures and enamel damage was significantly increased in a group of medical subjects with

the tongue piercing. It is noteworthy that defects to the teeth or prosthetic restorations correlate with the size and longevity of the jewelry as the longer the ornament is, the greater the risk of damage to the dentition or prosthetic restorations (17, 23, 24, 25). In order to reduce the amount of aforementioned complications ornaments with soft rubber ends and acrylic crew caps are used instead of those with metal ends (12).

Other local complications:

Among a wide range of other local complications, one of the most frequent during the procedure of piercing, pain should be distinguished. It often results from lack of anesthesia (17, 26). Rarely abundant bleeding or hemorrhage have been documented as results of blood vessels damage during the procedure of piercing. They are considered as particularly dangerous complications in the area of the tongue due to its profuse vascularization (17,27,28). Other local complications include nerve damage and paresthesia which might lead to impaired functions of deglutition, mastication and speech (22), generation of galvanic currents between oral jewelry and metallic dental or prosthetic restorations, swelling or pain of the area adjacent, interference in speech, mastication and swallowing of the ornament after its placement, as well as allergic reaction in particularly in case of nickel, chromium, nickel-cobalt or other metals content in the ornament (2, 29, 30). Intraoral jewelry may also lead to *Candida albicans* colonization (31). Furthermore, a study by Lopez-Jornet (20) indicates that in a group of 97 patients with oral piercing 4,1% have reported the development of halitosis and 9,2% a slight metallic aftertaste in the mouth. Moreover 14,3% have noticed increased salivary flow, however according to other sources (11, 12) this complication has not been frequent, and it has been likely to resolve over time.

Systemic complications

It should be emphasized that not only local but also serious systemic complications are associated with oral piercing. An inadequate sterilization process as well as a lack of appropriate maintenance may result in the formation of an entry point for pathogens, thereby increasing the risk of infection. Systemic complications may vary, and they involve transmission of hepatitis B, C or HIV infection, osteomyelitis, endocarditis and *Pseudomonas aeruginosa* infection (10, 32). It is also crucial to ensure that the piercing is fastened properly and not damaged as otherwise there is an increased risk of aspiration of the ornament and airways obstruction (17, 32). One of the most dangerous complications that may result in stridor and severe breathing difficulties is Ludwig's Angina. It is connective tissue inflammation which constitutes life threatening condition (3, 33, 34). It has been also reported that oral piercing procedure might

lead to the development of the cerebellar brain abscess which is another potentially life-threatening complication (17, 35).

Association between complications and the pierced area

It is important to note that in addition to the general piercing implications that may arise regardless of ornament location, which have been previously discussed, there are also some implications that are strictly dependent on the area of the ornament presence, for instance according to Singh et al. (19), stimulation of the uvula area during the procedure of piercing may lead to extended sudden gag reflex which may contribute to dangerous complications such as piercing the side of the throat or dropping either the needle or the piercing within the oral cavity. Sometimes it may also result in a bisection of the uvula (10, 36, 37). In contrast, piercing within the lip area may be associated with a range of adverse effects such as gingival trauma and recession, as well as narrow width of keratinized gingiva (38, 39), lip inflammation and overgrowth of the local tissues (40). Furthermore, taking into consideration piercing of the tongue, it may result in gingival recession on the lingual aspect of the lower front incisors, increasing of the periodontal pocket depth (36, 41), the embedment of the piercing in the tongue as well as a bifid tongue (28, 42). Among other complications associated with tongue piercing, a cerebral thrombophlebitis related to pneumonitis after the tongue piercing has been also reported (33).

The impact of maintenance on complications

Oral jewelry provides an additional retention recess for bacteria (7, 11) and the accumulation of both biofilm and calculus may increase the risk of adverse effects such as infections (28). The occurrence and severity of complications is indispensably dependent on the maintenance practices such as regular removing and cleaning of the ornament as well as the maintenance of thorough oral hygiene. According to a study conducted by Plessas et al. (16) less than a one third of medical subjects have cleaned the piercing regularly, 17,3% have used antimicrobial solution for ornament cleaning while 12,7% have used brushing as a method of maintaining piercing hygiene. The issue of hygiene has been also taken into consideration by Covello et al. (6) who reported that out of 387 selected participants of the study as much as 52,8% have shown insufficient oral hygiene conditions, 25,7% barely sufficient and only the minority of 21,4% good oral hygiene. Furthermore, 44% have suffered from localized gingivitis, almost always adjacent to their piercing and 42% have shown symptoms of generalized gingivitis. Only 14% of medical subjects have not presented any symptoms of gingival inflammation. When it comes

to the methods of maintaining hygiene 48,5% have not developed any type of cleaning habit of the piercing, 40% have used both - brushing and antimicrobial solution in order to maintain proper hygiene, 32% only antimicrobial solution and 28% only brushing technique.

The impact of wear time on complications

Among a range of factors that contribute to potential complications caused by piercing, duration of a wear time is significantly important. Study conducted by Plessas et al. (16) indicates that long-term wear of oral piercings contributes to increased risk of negative consequences such as gingival recession, attachment loss and fracture of the tooth. Oral tissues exposed to continuous impact of the piercing are more likely to be affected negatively. For wear time between 13 and 36 months and 36 months or longer, statistically significant association between the pierced area and dental defects as well as gingival recession have been observed. However, according to Campbell et al. (43), who investigated the influence of tongue piercing on oral health, damage to the dentition might occur within the first year after the tongue piercing.

Social awareness regarding potential complications

In order to prevent the negative consequences of oral piercing, awareness of its potential influence on health as well as education regarding the importance of hygiene should be crucial. Meanwhile, a study conducted by Vozza et al. (44) indicate that in a group of 225 medical subjects who have been asked to complete a questionnaire regarding the oral and systemic complications of oral piercing, the majority of 53,7% have not been informed about the possible negative implications of oral piercing on their health. These results correlate with a study by Plessas et al. (16) which indicates that out of 110 medical subjects, as many as 70,9% have not been aware of oral piercing consequences for general health, 26,4% for teeth and 49,1% for gingiva. The results of both studies prove that there is a lot to improve in the area of awareness and knowledge among society.

The role of medical professionals

The importance of medical professionals should be emphasized, as they ought to educate their patients about both local and systemic implications of oral piercing. Patients should be informed about proper ornament care concerning hygiene as well as the importance of regular professional dental check-ups and oral examinations to ensure early detection and treatment of possible adverse effects. Furthermore, during dental appointments, doctors should document the presence of oral piercing and its characteristics regarding location, hygiene, habits,

condition of adjacent tissues as well as wearing time (16). It should be also mentioned that besides the adverse effects, oral jewelry may hinder performing various medical procedures such as dental examination and treatment, application of anesthesia, radiographic examination, teeth bleaching and intubation (45, 46).

The role of piercers regarding increasing social awareness

Another issue that should be put on display while discussing the importance of education is the awareness and knowledge of the body piercers to whom people go to in order to have their piercing procedure done. The majority of people choose piercing studios instead of seeking medical professionals in order to get piercing which is shown in the study conducted by Garcia-Pola et al. (47). The study indicates that 80.8% of piercing procedures have been performed in a piercing studio. It has been also noticed by Kieser et al. (48) who reports that only 9,3% of medical subjects have decided to have their piercing performed by a dentist or a medical doctor. Therefore, piercers could have a considerable influence on education and increasing awareness of their clients regarding potential adverse effects as well as the importance of proper hygiene maintenance. Meanwhile, studies by both Vozza et al. (49) and Covello et al. (6) indicate that piercers are not familiar enough with the implications of the oral piercing on health themselves and often do not inform their clients about potential risks. Frequently piercing procedures are performed by self-trained people with no medical expertise or relevant necessary training who lack essential knowledge regarding anatomy, sterilization, prevention of complications, emergency procedures as well as various medical conditions (11,12, 39, 50).

Conclusions

The procedure of oral piercing presents significant concerns for dental, periodontal and general health. Multiple studies indicate that oral piercing may lead to various local and systemic complications which prevalence and severity often correlate with the pierced area, duration of a wear time as well as lack of proper ornament maintenance practices. The key role in taking preventive measures should be to increase the social awareness of potential risks as there is a widespread lack of proper education in this matter. Dental professionals could play a crucial role in those aspects by informing their patients about the importance of regular dental examinations, professional cleaning and maintaining proper oral hygiene in order to minimize the number and the severity of potential adverse effects. Furthermore, they should also be able to advise their patients who contemplate oral piercing without prejudice and with empathy, yet based on updated, scientifically confirmed information regarding this matter. However, the task

of spreading knowledge and increasing the awareness of society should not solely be a medical professionals' responsibility. The role of piercers in this field ought to be also underscored since as numerous studies have shown for many individuals, the adventure with piercing begins in the piercing studio and being well informed in terms of potential complications, proper maintenance of the ornament and aftercare from the very beginning could contribute significantly to the reduction of adverse effects.

Disclosure:

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