WEB OF SCIENTIST: INTERNATIONAL SCIENTIFIC RESEARCH JOURNAL
ISSN: 2776-0979, Volume 3, Issue 11, Nov., 2022

ASSESSMENT AND COMPARATIVE ANALYSIS OF THE STATE OF THE BUCCALE EPITHELIUM AND ORAL CAVITY HEALTH IN PERSONS HAVING TO SMOK TOBACCO

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ANNOTATION

Based on the data of a comprehensive oral health examination in 21 respondents aged 21 to 26 years, the results were analyzed and conclusions were drawn about the effect of different types of smoking on dental health. The respondents were initially divided into 3 groups of 7: nonsmokers, e-cigarette smokers, and tobacco cigarette smokers. All patients were free of chronic and infectious diseases at the time of examination, taking medications at the time of examination was excluded. Comprehensive assessment of the state of the oral cavity included: monitoring the state of buccal epithelium, assessment of dental indices (Green-Vermillion index (Green, Vermillion, 1964), Muellman bleeding index (modified by Cowell) and papillary-marginal-alveolar (PMA) index), ph-metry , determination of calcium content in oral fluid. The study revealed that smoking both tobacco and electronic cigarettes increases the risk of developing various pathological changes in the oral epithelium, disrupting its normal keratinization regardless of the means of smoking. It is worth specifying that reduction of reactivity of cellular elements entails inhibition of protective properties of mucosal epitheliocytes. Values of the Green-Vermillion index (Green, Vermillion, 1964), the Muellman bleeding index (modified by Cowell) and the papillary-marginal-alveolar (PMA) index also speak about the worsening of oral hygiene and periodontal condition in respondents who smoke tobacco and electronic cigarettes. Tobacco smoking is more detrimental, as indicated by elevated pH=8.098±0.001 and oral calcium ion concentrations of 2.7±0.001 mmol/L after smoking. The data obtained increase the fund of knowledge about the effect of different types of smoking on human oral health and can be used both in metanalytical studies and in informational anti-smoking.

Keywords: smoking, oral health, buccal epithelium, oral fluid ph-metry, quantitative determination of calcium ions in the oral fluid, electronic cigarettes, tobacco cigarettes, Green-Vermillion index, Müllemann , Cowell's bleeding index, papillary-marginal-alveolar index.

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Introduction

The highest level of prevalence of smoking is the leading medical and social problem that the world community is currently solving. In 2020, the World Health Organization called the tobacco epidemic one of the most threatening for humanity: about 1.3 billion people smoked tobacco, and its consumption caused the death of more than 8 million people every year. Tobacco addiction is included in the International Statistical Classification of Diseases. Smoking adversely affects the state of all body systems, increases the risk of oncological diseases, leads to chronic stress caused by addiction, thereby dramatically reducing a person's standard of living [2].

In addition to tobacco cigarettes, about 10 years ago, electronic cigarettes began to be actively sold on the world market. According to rough estimates for 2020, about 20.8 million people in the world smoke them. Manufacturers of this product position it as an alternative, more harmless way of smoking [3]. Nevertheless, at the moment, the impact of this type of smoking on health continues to be actively studied by the global scientific community. All of the above determines the relevance of studying the impact of various types of smoking on the dental health of the population. A comprehensive assessment of the state of the oral cavity can be made on the basis of monitoring the condition of the buccal epithelium, assessing dental indices (Green-Vermillion index (Green, Vermillion , 1964), Mulleman bleeding index (in Cowell's modification) and papillary-marginal-alveolar (PMA) index), ph -metry of the oral fluid, as well as determining the amount of calcium in the oral fluid. After analyzing these parameters for respondents who smoke tobacco and electronic cigarettes, we can compare and evaluate the impact of these types of smoking on the dental status of the subjects.

Purpose of the study: To study and compare the effects of smoking tobacco and electronic cigarettes on the buccal epithelium of the oral mucosa and dental health of the subjects.

Material and methods: The study involved 21 people: 7 of them smoke tobacco cigarettes, 7 people smoke electronic cigarettes, 7 people do not smoke. The age of the patients was 21±1.4 years, the smoking experience was no more than 5 years. At the time of the examination, all patients did not have chronic and infectious diseases, the use of drugs at the time of the examination was excluded.

The subjects underwent a comprehensive examination, consisting of:

1) Examination of the oral cavity and determination of the Green-Vermillion index (Green, Vermillion , 1964), the Mulleman bleeding index (in Cowell's modification) and the papillary-marginal-alveolar (PMA) index.

2) Studies of the buccal epithelium: in all patients, biomaterial was taken from the buccal mucosa using a metal spoon, the material was taken in the morning, on an

empty stomach. Further, the material was diluted with saline, collected in sterile test tubes and sent to the laboratory for analysis. The differentiation index (IDif) and the keratinization index (IO) of epitheliocytes were calculated .

3) Quantitative determination of calcium ions in the oral fluid using an ion-selective electrode. Ionized calcium in the oral fluid is about 55% of the total amount of calcium, it is he who is the most informative from a clinical point of view and makes it possible to judge the activity of de- and remineralization processes . Normal is the concentration of ionized calcium in saliva from 0.64 to 1.84 mmol / l.

4) Quantitative determination of the pH of the oral fluid using a pH meter (ionomer). Saliva in the composition of the oral fluid has pronounced bactericidal and bacteriostatic properties due to a number of enzymes and biologically active substances that make up its composition. The activity of these substances is highest at the optimum pH value of 5.6-7.9 . Consequently, the condition of the oral mucosa, periodontal, as well as dental health will depend on this indicator. Oral fluid was taken on an empty stomach before and after smoking tobacco or electronic cigarettes by the subjects.

The data obtained were evaluated using Student's t-test and using the Biostat program.

Research results. 11 men (52%) and 10 women (48%) aged 18 to 26 were examined. In non-smoking patients, the OHI-S index was 0.9±0.011 ($p< 0.05$ between groups), the Mullemann bleeding index was 0.6±0.01 ($p<0.05$ between groups), the PMA index was 1, 32±0.03% ($p<0.05$ between groups). In patients who smoke tobacco cigarettes, the values were: OHI-S index was 0.87±0.012 ($p<0.05$ between groups), Mulleman bleeding index - 0.69±0.01 ($p<0.05$ between groups), PMA index - 1.32±0.03% ($p<0.05$ between groups), and for respondents who smoke electronic cigarettes: OHI-S index was 1.3±0.012 ($p<0.05$ between groups), index bleeding according to Mullemann - 0.98±0.066 ($p<0.05$ between groups), PMA index - 1.32±0.03% ($p<0.05$ between groups).

When studying the differentiation index of epitheliocytes in non-smokers, no deviations from the norm were revealed, which corresponded to - Idif 391±2.8 conventional units . The surveyed smokers using tobacco cigarettes showed an increase in IDif 435±3.2 c.u. , which can be associated with the toxic effects of tobacco on the oral mucosa; in relation to patients using electronic cigarettes, there was a slight increase in IDif 420±2.9 units , which is explained by the duration of exposure to high temperatures on the oral mucosa. A significant increase in the keratinization index (AI) was also found in patients who smoke tobacco cigarettes, which was accompanied by an increase in the number of pathological mitoses in epitheliocytes ,

as well as in patients who smoke electronic cigarettes - 1.0 ± 0.04 units . and 0.6±0.02 units , respectively (at a rate of 0.1-0.3 units). The increase in IDif and IE is associated with an increase in the number of mitoses in epitheliocytes . In smoking patients, the development of hyperkeratosis of the oral mucosa is noted as a result of the toxic effect of tobacco and an increase in the 5th stage of epithelial cell differentiation , which indicates the inability of cellular structures to rejuvenate.

When analyzing samples of the oral fluid of the respondents, it was found that the highest concentration of ionized calcium in saliva is observed after smoking electronic cigarettes - 3.000 ± 0.001 mmol / l, which exceeds the upper limit of the norm by 1.6 times and indicates an actively ongoing process of demineralization. In young people who use tobacco cigarettes, the concentration of calcium in saliva increased by 53.9%, respectively, which, of course, indicates the harmful effects of these types of smoking. The pH values of the oral fluid in the group of non-smokers were 7.233±0.002. All subjects immediately after smoking had a sharp increase in saliva pH , which in the group of smokers of tobacco cigarettes reached 8.098 ± 0.001. With an increase in the pH of saliva, a rapid deprotonation of dihydrophosphate ions occurs, the formed PO4-3 ions, interacting with calcium, form sparingly soluble calcium orthophosphate salts of tartar [1].

Conclusion: Thus, after conducting a comprehensive assessment of the dental status of non-smokers and smokers of tobacco and electronic cigarettes of the respondents, the following conclusions can be drawn:

1) Smoking both tobacco and electronic cigarettes increases the risk of developing various pathological changes in the epithelium of the oral cavity, disrupting its normal keratinization, regardless of the means of smoking. It should be clarified that a decrease in the reactivity of cellular elements entails an inhibition of the protective properties of mucosal epitheliocytes .

2) The values of the Green-Vermillion indices (Green, Vermillion , 1964), the Mulleman bleeding index (in Cowell's modification) and the papillary-marginal-alveolar (PMA) index also indicate a deterioration in oral hygiene and periodontal health in smokers of tobacco and electronic cigarettes respondents.

3) A more harmful type of smoking is tobacco smoking, as evidenced by increased pH = 8.098 ± 0.001 and the concentration of calcium ions in the oral fluid 2.7 ± 0.001 mmol / l after smoking.

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