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SPECTROMETRY AS A NEW INSTRUMENTAL METHOD FOR VERIFICATION OF SALIVA CRYSTALLOSCOPIC STUDY

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ABSTRACT — The aim of the study was to evaluate the spectrometric characteristics of crystalloscopic facies of saliva in practically healthy people. We studied own crystallization of mixed saliva from 65 healthy adults by classic crystalloscopy (with parametric criteria) and spectrometry (at wavelengths of 300, 350 and 400 nm). Based on the study, the standard spectrometric characteristics of dried saliva samples from practically healthy adults were established. The obtained spectrometric patterns of saliva crystalloscopic facies can be used as reference intervals for a wide range of salivadiagnostics tasks.

KEYWORDS — saliva, crystallization, facia, spectrometry, biocrystallomics.

INTRODUCTION

Recently, the scientific community has become increasingly interested in oral fluid as a material for studying its capacity to specific dehydration structuring [1–3, 5, 7]. In recent decades, its study has been considered as an integral test that provides generalized information about the composition and properties of this biological liquid [1–3, 7]. In particular, the study of saliva microcrystallization in dentistry is highly informative [2, 4, 5, 7]. The largest number of works is related to the diagnosis and treatment of patients with caries, including monitoring the effectiveness of correction technologies [7]. In addition, the features of the physical and chemical properties of artificial saliva have been studied using microcrystallization technologies [4]. At the same time, there is a question of objectifying the results of evaluating the crystallogenic properties of saliva, which can be solved by applying instrumental methods.

In this regard, ***the aim of the study*** was to evaluate the spectrometric characteristics of crystalloscopic facies of saliva in practically healthy people.

MATERIAL AND METHODS

Mixed saliva was obtained in 65 healthy adults without any dental pathology (age 24–27 years). Oral fluid was collected in the morning (9–10 am) in a well-lit room. During the 3 hours before the study, the subjects did not perform significant physical activity and were not in a state of psychoemotional stress. Before collecting the biological fluid, the subjects thoroughly rinsed their mouths with 100 ml of distilled water for 5 minutes. Then the oral fluid (amount – 1 ml) was collected by spitting into clean, dry test tubes.

Further, the microspecimens (facias) were prepared according to the method of classical crystalloscopy [6]. The results of structuring were evaluated using a previously developed system of semi-quantitative parameters (specifically — crystallizability and structure index) [6]. At the next stage, all samples of biological fluid were investigated by spectrometric analysis performed on a spectrophotometer "PowerWave XS" (USA) at wavelengths of 300, 350 and 400 nm. To level the effect of glass characteristics on the results of spectrometric studies of saliva facies, a correction for the optical density of glass was introduced.

Statistical processing of the results was performed using variation statistics algorithms using Microsoft Excel 2007 and Statistica 6.1 for Windows.

RESULTS

At the first stage, the features of saliva self-crystallization in the formed group of practically healthy people were evaluated (Fig. 1). It was found that the level of the main parameters of the crystalloscopic test in the examined individuals lay in the previously selected normal range [2, 6]. At the same time, the crystallizability and structure index, which characterize the density of crystal elements and the complexity of their structure, respectively, were determined at high values.

The second stage of analysis of crystalloscopic facies was their direct spectrometric study (Fig. 2). It is shown that the spectrometry analysis of saliva crystallograms allows forming a stable *pattern* for all used wavelengths (300, 350 and 400 nm).

The study of the optical density of the preparations in the near-visible range of the spectrum

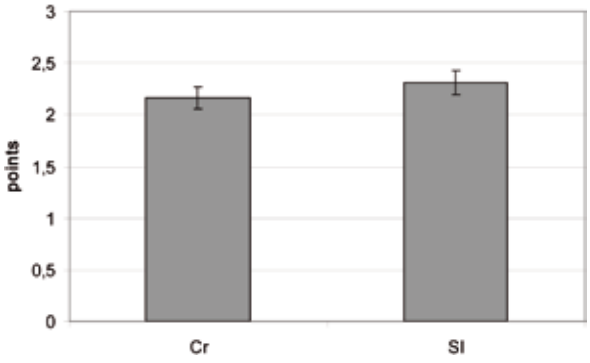

Fig. 1. Crystallizability (Cr) and structure index (SI) values in dried specimens of mixed saliva of healthy adults

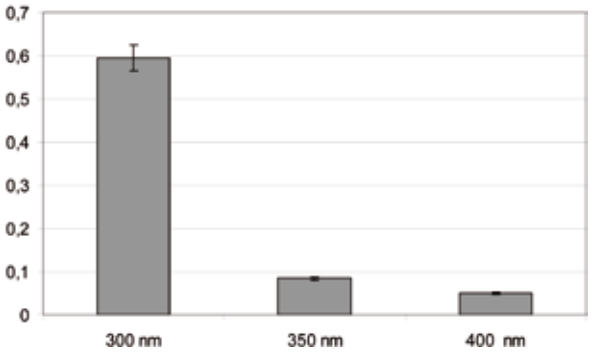

Fig. 2. Optic density of crystalloscopic faicas of mixed saliva of healthy adults (at different wavelengths)

(400 nm) allowed us to detect its approach to zero. In addition, a direct correlation was found between the crystallizability and the structure index levels with the optical density of facies at a wavelength of 300 nm (r=0.68 and 0.57, respectively, p<0.05).

CONCLUSION

Based on the study, the standard spectrometric characteristics of dried saliva samples from practically healthy adults were established. The obtained spectrometric patterns of saliva crystalloscopic facies can be used as reference intervals for a wide range of salivadiagnostics tasks.

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