http://dx.doi.org/10.35630/2199-885X/2021/11/1.33

SALIVA CRYSTALLIZATION IN PATIENTS WITH COMBINED GASTROENTEROLOGICAL AND CARDIOVASCULAR PATHOLOGY

Received 17 February 2021;
Received in revised form 24 February 2021;
Accepted 26 February 2021

Andrew Martusevich ✉, ***Oksana Shubina,***
Tatyana Sinitsyna , ***Svetlana Kosyuga*** ,
Zhanna Simonova

Privolzhsky Research Medical University, Nizhny Novgorod, Russia,
Kirov State Medical University, Kirov, Russia

✉ *cryst-mart@yandex.ru*

ABSTRACT — The purpose of this study was to estimate the specifity of saliva crystallization in comorbid pathology of digestive and cardiovascular systems. We collected saliva from 35 patients with coronary artery disease, 48 patients - with ulcer disease and 112 patients - with their combination. The features of self and initiated crystallization in the patients of all groups were evaluated using a specialized system of semi-quantitative parameters. It was stated that the crystallograms of comorbid patients are characterized by a clearly visible predominance of single-crystal elements over dendritic ones. The total density of structures in the facias is significantly reduced in comparison with both healthy people and patients of other groups.

KEYWORDS — saliva, crystallization, coronary artery disease, ulcer disease.

INTRODUCTION

Diseases of the digestive system and cardiovascular system occupy an important place in the structure of general morbidity, representing an important economic, social and medical problem [1, 2, 6–9]. It should be emphasized that the pathogenesis of isolated coronary artery disease (CAD) and peptic ulcer disease (PUD) has been studied in sufficient detail, but mechanisms of their formation and development of its combination are debatable [1–4, 6–9]. From these positions, the disclosure of the metabolic shifts accompanying this combined pathology is relevant [1, 3, 4, 6, 9]. Taking into account the above mentioned, the ***purpose of this study*** was to investigate the characteristics of saliva crystallization in comorbid pathology of digestive and cardiovascular systems.

MATERIAL AND METHODS

We collected saliva from 30 healthy people, 35 patients with isolated CAD, 48 — with UD, and 112 — with their combination. The features of self-and initiated crystal formation of these biological substrates were evaluated using a specialized system of semi-quantitative parameters [5].

The diagnosis of CAD was established by the clinical examination, as well as by instrumental methods (ECG registration at rest and during exercise, daily monitoring of the ECG by Holter, echocardiography). Angina pectoris of I FC was diagnosed in 45 examined patients (40.2%), angina pectoris of II FC — in 67 (59.8%). The duration of the history of CAD ranged from 2 to 8 years. In the anamnesis of 29 patients (25.8%), there was a history of myocardial infarction more than 2 years ago. During the study, 94 patients (83.9%) had peptic ulcer disease in remission, 18 — in the acute stage (16.1%). The diagnosis of peptic ulcer disease was verified by gastroduodenoscopy. In 83 patients (74.1%), duodenal ulcer was confirmed, in 29 (25.9%) — gastric ulcer. For the diagnosis of helicobacteriosis, a biopsy method and a serological blood test were used.

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

RESULTS

The study of the free crystal formation of saliva in patients with combined ischemic heart disease and gastric ulcer disease allowed us to establish the following patterns. The discrete part of all samples is represented by amorphous bodies and single-crystal elements, and the extremely high density of crystallization centers in the samples is noteworthy. Numerous destroyed and altered structures are noted. The marginal zone is expressed along the entire perimeter of dried specimens.

The visuametric analysis of saliva crystalloscopic facias also demonstrated the formation of a new pathological *pattern*, a combined pathology, which is different from the symptoms of the single diseases and is not their algebraic mean (Fig. 1). It was found that for patients with only gastric ulcer disease, the transformation of the crystalloscopic picture of saliva includes a moderate inhibition of structure formation, manifested in an increase in the proportion of single-crystal elements in the facias.

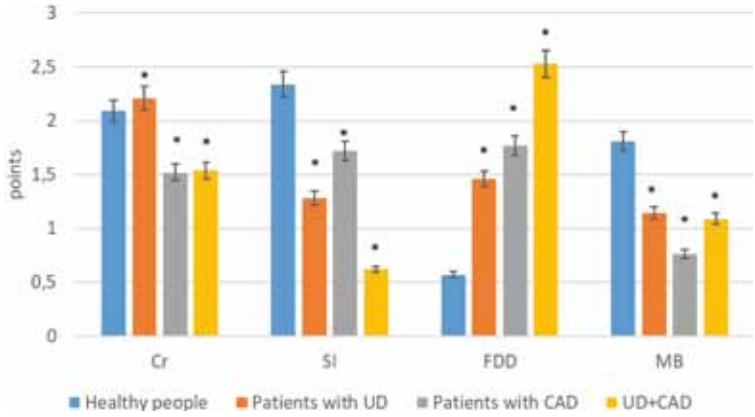

*Fig. 1. Visuametry of oral fluid facias in healthy people and patients with ulcer disease (UD), coronary artery disease (CAD) and combined pathology (UD+CAD) Cr — crystallizability, SI — structure index, FDD — facia destruction degree, MB — clearity of margina l belt; * — statistical value of differences to healthy people is p<0.05*

This is indicated by a pronounced drop in the level of the structural index combined with a minimal increase in crystallizability. In the presence of only ischemic heart disease, a moderate drop in saliva crystallizability was observed in combination with a similar, but smaller modulating change in the index of the structure of the biological environment relative to patients with isolated gastric ulcer. It should be noted that in the dried samples of oral fluid of this contingent of patients, the destruction of elements was more pronounced than only in gastroduodenal ulcerogenesis. In addition, the representatives of this group were found to have the minimum diameter of the marginal zone of the facia.

CONCLUSION

Based on the performed studies, it was shown that the most significant shifts in the crystal formation of oral fluid were detected in patients with a combination of coronary artery disease and gastric ulcer. Thus, the crystallograms of these patients are characterized by a clearly visible predominance of single-crystal elements over dendritic ones. The total density of structures in the facias is significantly reduced in comparison with both healthy people and patients of other groups. The severity and depth of metabolic disorders occurring in the oral fluid of patients with combined pathology is additionally indicated by the subtotal destruction of the structural elements of the facias.

REFERENCES

1. **Banić M, Sutlić Z, Biocina B et al.** Peptic ulcer disease in dyspeptic patients with ischemic heart disease: search and treat? // Z Gastroenterol. – 2005. – Vol. 43, N 6. – P. 581–586. doi: 10.1055/s-2005-858073.
2. **Kucukazman M., Yeniova O., Dal K., Yavuz B.** Helicobacter pylori and cardiovascular disease // Eur. Rev. Med. Pharmacol. Sci. – 2015. – Vol. 19, N 19. – P. 3731–3741.
3. **Martínez Torres A., Martínez Gaensly M.** Helicobacter pylori: a new cardiovascular risk factor? // Rev. Esp. Cardiol. – 2002. – Vol. 55, N 6. – P. 652-656.
4. **Martusevich A.K., Simonova Zh.G., Tarlovskaya E.I.** Helicobacter pylori and pathology of the cardiovascular system: is the path to the heart really through the stomach? // Russian Journal of Cardiology. – 2012. – No 3. – P. 91–101.
5. **Martusevich A.K., Kamakin N.F.** Crystallography of biological fluid as a method for evaluating its physicochemical characteristics // Bull. Exp. Biol. Med. – 2007. – Vol. 143, no. 3. – P. 385–388. doi: 10.1007/s10517-007-0118-7.
6. **Sharma V., Aggarwal A.** Helicobacter pylori: Does it add to risk of coronary artery disease // World J. Cardiol. – 2015. – Vol. 7, N1. – P. 19–25. doi: 10.4330/wjc.v7.i1.19.
7. **Serra R., Ielapi N., Barbetta A., Andreucci M., de Franciscis S.** Novel biomarkers for cardiovascular risk // Biomark Med. – 2018. – Vol. 12, N 9. – P. 1015–1024. doi: 10.2217/bmm-2018-0056.
8. **Simonova Z.G., Martusevich A.K., Tarlovskaya E.I.** Analysis of the clinical efficiency of eradication therapy in patients with coronary heart disease associated with gastroduodenal pathology // Ter. Arkh. – 2017. – Vol. 89, N 8. – P. 37–42. doi: 10.17116/terarkh201789837-42.
9. **Simonova Zh.G., Martusevich A.K., Tarlovaskaia E.I.** The course of coronary heart disease concurrent with peptic ulcer disease: clinical and pathogenetic aspects // Ter. Arkh. – 2014. – Vol. 86, No 1. – P. 33–36.