MIcroHeModYnaMiC CHanGes
as indiCator oF PsYchoeMotional
stress at dental treatMent

A B S T R A C T
— The article deals with studies on microcirculatory changes as indicators of psychoemotional stress development. Diagnosis of the capillary blood flow was made by studying LDF-grams obtained by carrying out laser Doppler flowmetry. The study was carried out in the area of the inflamed periimplant oral mucosa in the patients with psychoemotional stress (30 people). To obtain normalized characteristics, the control group comprised patients with postprothetic complications after dental implants without any psychoemotional disorders. It was revealed that under stress capillary blood flow changes both at the oscillatory and non-oscillatory levels. Increased blood inflow and disordered venous outflow were noted against the blood vessels vasodilatation. When analyzing high and low frequency oscillations with the method of wavelet transformations, it was noted that endothelium activity increased, but sympathetic adrenergic vasomotors and precapillaries tone decreased.

Laser Doppler Flowmetry (LDF) can be applied as a diagnostic method for stress situations at dental treatment.

K E Y W O R D S — microcirculation, stress, periimplant area, inflammation, diagnostics.

I N T R O D U C T I O N
The relevance of modern diagnostic methods in applied dentistry is determined by the high prevalence and intensity of dental diseases. The knowledge of diagnostic approaches, the principles of constructing and making a diagnosis is of great importance for medical practice, since the formulated diagnosis is the rationale for the tactics of therapeutic and preventive measures [1–10].

The discovery of psychoemotional stress is a vital indicator, as it is a non-specific basis of numerous diseases including dental ones. Psychoe-
patient was sitting on the dental chair. The sensor was placed on the inflamed periimplant area to study hemodynamics of the oral mucosa. Capillary blood flow was monitored for 10 minutes. At the first stage the indicator of microcirculation, the root-mean-square deviation and coefficient of variation were estimated and at the second stage the contribution and oscillation of high and low frequency flux motions were studied.

RESULTS

Based on the data obtained from the questionnaires, it can be said that all the patients were in a stress situation. So, 12 patients (40%) showed 130 points, 10 patients had 160 points (33,3%), 5 patients — 180 points (16,7%) and 3 patients showed 195 points (10%). The average amount of points were 154,8±4,2 that was the evidence of a high level of stress.

To obtain normalized indices of LDF-gram, while carrying out LDF-metry, there was a control group of normal people who did not suffer from stress. The absence of a psychoemotional factor was also confirmed by questioning. The patients under stress conditions showed blood vessels dilatation against lower activity of the sympathetic vasomotors and decreased tone of precapillaries, increased amplitude of endothelial, neurogenous and myogenous oscillations. So, increased amplitude of endothelial oscillations (VLF by 57%, p<0,05) characterizes a higher activity of endothelial secretory function, development of endothelium-dependent dilatation of the vessels. Increased number of flux motions of the myogenous origin (L.Fs by 64%, p<0,05) characterizes a lower tone of precapillaries, Increased amplitude of neurogenous oscillations (L.Ft by 54%, p<0,05) is the evidence of a lower activity of sympathetic adrenergic vasomotors and development of sympathetic vasodilatation. Increased oscillations of the pulse and respiratory waves occur against pulse acceleration and respiratory impact on the vegetative heart nerves alongside with the inflow of arterial blood and difficulty in venous outflow. The study of the non-oscillatory indices showed the increase of the microcirculation index M by 37%, but the root-mean-square deviation and variation index are 35% lower and makes 5,32±0,3%. Lowered speed of the local blood flow is associated both with weakened active factors of blood flow regulation and decreased flux motions energy.

DISCUSSION

Thus, the analysis of the data obtained is the evidence of expressed microcirculatory changes in a stress situation. Laser doppler flowmetry is a noninvasive method of examination that shows objectively the state of microhemodynamics and can be used as a diagnostic method of psychoemotional condition at dental treatment.

CONCLUSION

Investigation of microcirculation parameters in patients with dental implant complications has revealed disturbances of microhemodynamics. Therefore, further studies may help find the cause/effect relationships that justifies the need for such studies in the future.

REFERENCES


