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Mariia Faustova[1], Olexandr Nazarchuk[2], Maiia Ananieva[1]

[1]Higher State Educational Establishment of Ukraine
"Ukrainian medical stomatological academy"
[2]National Pirogov Memorial Medical University
36011, Shevchenko st., 23, Poltava, Ukraine,
email – mashafaustova@ukr.net

THE COMPARATIVE EVALUATION OF NEUTROPHIL ACTIVITY DEPENDING ON TIME OF PERI-IMPLANTITIS DEVELOPMENT

Abstract

Peri-implantitis belongs to the number of the most common complications of dental implant placement that can occur during the procedure as well as in the postoperative period. A key role in the immune defence of oral cavity belongs to nonspecific factors that act as a powerful barrier and are the first to respond to foreign agents entering the mouth

The **aim** of this work was an exploring the neutrophil bactericidal activity depending on time of peri-implantitis development by using NBT tes.

For success of this aim samples of capillary blood of 50 patients were checked up by NBT tes. Among the 100 cells we counted the share of active neutrophils. Period of peri-implantitis development after dental implant placement correlates with the changes of the share of active neutrophils in patients' blood.

Key words: implantation, neutrophil activity, peri-implantitis, complications of dental implantation.

Introduction

Nowadays, popularity of dental implantation is rising on the background of dental disorders prevalence [1]. More than 2 million implants are screwed every year worldwide [2]. That is why new protocols of operation, modern implantation systems are created, what sometimes leads to the decreasing of quality procedure [3]. According the 11th European Workshop on Periodontology peri-implantitis belongs to the number of the most common complications of dental implant placement that can occur during the procedure as well as in the postoperative period (within year and even more) [1]. Age of a patient, his immunity and oral microflora cause the key role on development of complications. Therefore,

investigations of some immune marks are important for treatment of peri-implantitis as well as diagnostic of them [4].

This study was **aimed** at exploring the neutrophil bactericidal activity depending on time of peri-implantitis development by using NBT tes.

Materials and methods

A total of 50 patients of average age group by WHO (46-59 years) whom were detected peri-implantitis were subjected to the comprehensive check-up. The first group enrolled 25 people with peri-implantitis before 3 months after implant placement. 25 people of the same age with peri-implantitis in a long term after implantation (around 1 year) made up the second group. Samples of capillary blood were taken into sterile vials containing heparin and then delivered to the laboratory. The functional activity of neutrophils was evaluated by nitroblue tetrazolium (NBT) reduction test (spontaneous NBT by Wixman M. E., Mayansky A.N.) [5]. Among the 100 cells we counted the share of active neutrophils (AN), containing dark-violet formazane (diformazane) granules and presented their percentage. Neutrophils containing clearly visible diformazane deposits were regarded as active cells, and netrophils with residual granules were considered as inactive. Statistical data processing was performed using Microsoft Excel 2010; statistical significance was determined by Student's test. Data were statistically significant at $p < 0.05$.

Results and their discussion

According to our data the share of active neutrophils in blood of the patients of the first group was increased compared with their normal evaluation. It reached 60,6±1,18 % that corresponds to the active stage of inflammation caused by surgical intervention and acute process around the implant.

However, the share of active neutrophils in blood of the patients with peri-implantitis which developed in remote period was significantly lower (28,3±0,98%) then normal evaluation. It can be explained by the displacement of acute process to chronic that promotes inhibition of some chains of immunity.

Conclusions

Thus, period of peri-implantitis development after dental implant placement correlates with the changes of the share of active neutrophils in patients' blood. Peri-implantitis that is developed exactly after surgery causes increasing of neutrophil activity and remote complications cause decreasing of this mark.

References

1. Derks J, Tomasi C. Peri-implant health and disease. A systematic review of current epidemiology. J Clin Periodontol. 2015;42 Suppl 16:158–71.

2. Froum, S. J. (Ed.). (2015). Dental implant complications: etiology, prevention, and treatment. John Wiley & Sons.

3. Oshida, Y., Tuna, E. B., Aktören, O., & Gençay, K. (2010). Dental implant systems. International journal of molecular sciences, 11(4), 1580-1678.

4. Yugay Y. V., Tolmachev V. E., Markelova E. V., Golitsyina A. A. Otsenka tsitokinovogo profilya u patsientov do i posle dentalnoy implantatsii // TMZh. 2013. #1 (51) S.31-33. Russian

5. Viksman M.E., Mayanskiy A.N. Sposob otsenki funktsionalnoy aktivnosti neytrofilov cheloveka po reaktsii vosstanovleniya nitrosinego tetrazoliya: Metod. rekomendatsii. — Kazan: Kazanskiy NIIEM, 1979. — 11. Russian