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ANTIOXIDIZING PROTECTION INDICES STUDY AND NUTRITION SUPPORT IN STOMATOLOGIC PATIENTS WITH METAL DENTURES INTOLERANCE

Summary. *The indices of the lipid peroxidation and antioxidizing system ferments activity in 46 stomatologic patients with intolerance of metal dentures are investigated. It was used the treatment for these patients by two schemes: thiotriazolin (I group) and thiotriazolin with additional antioxidant nutrition support (II group). We determined antioxidant nutrition support is an important therapy for intolerance of metal dentures patients, it can significantly decrease clinical manifestation of pathologic state, relieve the patient's suffering, and prevent the removal of dentures from the oral cavity, and reduce the medical cost of the patients.*

Key words: *antioxidizing protection indices, nutrition support, intolerance of metal dentures.*

I. Introduction

The accumulated knowledge of mankind led to the understanding the fact that any chemical substances, just metal, in depending on its quantity, can be indifferent, helpful or harmful (toxic) for the organism, i.e. as poison. Toxicity is defined as property (ability) of chemicals that act on biological systems by non-mechanically cause their damage, in relation of the human body — cause breach of the ability to work, diseases or death [1]. Currently, the orthopedic stomatologists for restoration of the defective teeth and dentition use various constructions with a large metal content, that under certain conditions can be harmful for health. It is known that the development of compensatory and adaptive processes in the organism under the chemicals effects is determined by functioning a universal biological natural detoxication system [2]. With it usually three groups of reactions are considered: enzymatic biotransformation of lipophilic xenobiotics with the participation of

cytochrome P-450 – depending monooxygenases (the first phase of detoxication), conjugation of reactive metabolites and hydrophilic compounds (the second phase of detoxication), antioxidant protection (AOP), which includes the antiradicalic and antiperoxidic mechanisms (the third phase of detoxication). The violation of the coordinated detoxicated process is one of the common toxicity mechanisms, it leads to disruption of homeostasis and development of biochemical pathology. Improving the efficiency of the natural system of detoxication and AOP with help of the biologically active substances and synthetic drugs opens the ways for experimental prevention and therapy of poisoning by chemicals, toxic effects of which are formed at the expense of the mechanisms inhibition of endogenous dehydration. Literature data and our own researchs [3-5] suggest that one of the main link of the metal dentures intolerance pathogenesis is metal-toxicosis in which there is an imbalance between the intensification of free radical oxidation processes and inhibition of the antioxidizing system (AOS) activity, i.e. the violation of the prooxidizing-antioxidizing homeostasis. Currently, the treatment for the metalopathy includes using the membrane protectors with significant antioxidizing activity. One of the drugs, which has the such properties is Thiotriazolin (Galichfarm or Pharmaton, Ukraine) [2]. In our researchs we used this drug in the treatment for patients with the intolerance of the metal dentures [6]. It is nessary to mark that in the problem of increasing the organism antioxidizing status the normalization of weakened functions of his immune system, mobilization of existing organism nutrition support, with high antioxidizing activity is very significant. Unfortunately, malnutrition has remained a troublesome problem because of lack of nutrition support routines and a discrepancy between clinic practice and guidelines regarding nutrition support [7].

II. Problem statement

The aim of the work was to investigate the influence of Thiotriazolin and additional antioxidizing nutrition support on indicators of lipid peroxidation (LPO) and activity of AOS in patients with intolerance of metal orthopedic dentures. Under the dynamic and clinical supervision there were 46 patients with signs of metal dentures intolerance (21 men, 25 women), including 13 patients in the oral cavity had stamped-brazed constructions with nitride-titanium coating (recovery medium defects of dentition of the upper and lower jaw); 17 patients had a combination of cast and stamped-brazed constructions; 16 patients had one-piece constructions of dentures without nitride-titanium coating. The mean age was 47, 3 years. We also examined 15 conventionally healthy people (control group). In order to evaluate the clinical effect of the antioxidizing nutrition support in patients, we delivered patients into two groups. In the first (I) group ($n = 23$) treatment was performed by Thiotriazolin 0.1 g three times per a day for 21 days. In the second (II) group of patients, besides Thiotriazolin there were recommended antioxidizing nutrition support such as the roots of parsley 30 g per a day, and dry red wine Cabernet 150 ml per a day for 3 weeks. Venous blood was the material for the study, it was taked in

patients at the beginning and after treatment. By traditional biochemical methods AOS activity was examined by concentration of ceruloplasmin (CP), and transferrin (TF), and by the level of sulpho-hydrate (SH) groups; LPO was estimated by the concentration of malonicdialdehyde (MDA) in serum.

Statistical analysis

Analysis were performed using SPSS statistical software (SPSS for Windows Ver. 11.5). Results of different groups were compared using descriptive statistics (mean \pm SD). $P \leq 0.05$ was considered statistically significant.

III. Results

It was established that the degree of metal dentures intolerance manifestation in the patients depends on the number of metal inputs and their heterogeneity. Most patients had hypersalivation, glossalgia manifestations, paresthesia, tongue burning sensation, that arose immediately after the fixation of metal dentures. Irritability, headaches and poor sleep are joined to the clinical aspect.

In the table the lipid peroxidation and AOS activity indicators are presented for conventially healthy people (control group), and patients with metal dentures intolerance before treatment as a same after treatment by only thiotriazolin (I group) and both Thiotriozolin with additional antioxidizing nutrition support (II group). Evaluation of the received results shows significant difference between CP, TF, MDA concentrations and CP/TF for conventionally healthy people and patients with metal dentures intolerance before treatment (see table).

Table Indicators of lipid peroxidation and antioxidizing sustem activity in patients with metal dentures intolerance

Indicators	Conventionally healthy people (control)	Patients groups		
		Before treatment	After treatment by thiotriazolin (I group)	After treatment by thiotriazolin + antioxidizing nutrition support (II group)
CP (conv. un.)	28.55(0.76)	38.02(0.82)	34.93(0.61)*	28.94(0.72)***
TF (conv. un.)	0.17(0.02)	0.11(0.01)	0.12 (0.01)	0.13(0.01)*
CP/TF	167.94(22.06)	345.64(30.31)	291.08(30.37)**	222.61(25.88)***
MDA (mmol*1-1)	72.94(0.76)	91.81(0.57)	87.86(0.63)*	76.02(0.54)**
SH-gr. (mmol*1-1)	1.56 (0.15)	1.24(0.10)	1.27(0.09)	1.31(0.10)**

Note: * – $p < 0.05$; ** – $p < 0.01$; *** – $p < 0.001$ compared with indices before treatment.

There was found an increase in MDA and CP concentrations at 25.87% and 33.17% in patients before treatment comparatively control group. TF concentration was significantly reduced at 35.29% in patients by comparison control group. CP/TF ratio is one of the main indicators of the antioxidizing state. In patients before treatment this value was at 2.06 times more than in control group. There was established a decrease in the SH-gr. concentration at 20.52%. Thus, results indicate of significant reduction in antioxidizing reserves in patients with metal dentures intolerance comparatively control group as well as LPO intensification. We can see the LPO and AOS activity indicators significant change in patients who received Thiotriazolin and else more change if the additional antioxidizing nutrition support was used. We observed the tendency in LPO processes inhibition. As shows, the II group patients had a higher rate of reduction in MDA level than the I group patients (76.02 ± 0.54 vs 87.86 ± 0.63 , $p=0.001$), which indicated that antioxidizing nutrition support may be necessary for metal dentures intolerance patients. CP content in II group patients decreased at 23, 88% as compared with before treatment and at 17, 15% as compared with the data of the I group. We also noticed a slight increase in the TF concentration in the II group as compared with the data before treatment (18.18%). The CB/TF indicator in the II patients decreased at 35.60%, relative to «before treatment» and in the I group decreased at 15.78%. In the II group patients it was marked trend to an increase in the content of SH-groups at 5.64%; and in the I group – at 2.47%.

IV. Conclusions

The use of Thiotriazolin and antioxidizing nutrition support increases the resistance of cell membranes and causes LPO intensity decrease as well as an activation of antioxidizing protection. Our study indicated that, the mutual relations between LPO processes and AOS activity represent a picture of the toxico-chemical stomatitis pathogenesis conditioned by metal dentures intolerance. Thus, received results are evidence of a high efficiency of Thiotriazolin with antioxidizing nutrition support using in the treatment for the toxico-chemical stomatitis of the metalotoxic genesis.

1. The thiotriazolin reinforces natural detoxication factors at the effect of metallic orthopedic dentures.

2. The thiotriazolin as an effective adaptogen and hepatoprotective drug can eliminate symptoms of toxico-chemical stomatitis and is indicated for the treatment of patients with this pathology.

3. With the development of the toxico-chemical stomatitis caused by intolerance of the metallic structural materials when there is no possibility to delete given orthopedic elements it is recommended using both thiotriazolin and nutrition with high degree of antioxidizing properties.

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