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Treatment of Oral Mucosal Diseases in Workers exposed to Harmful Factors of Production

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Abstract

Up to the present moment oral mucosal diseases is the least understood medical and social problem of stomatology. The article deals with pathogenesis and prevalence, methods and results of treatment of oral mucosal diseases in workers exposed to harmful factors of production during sensitization of oral mucosa to fungal allergens and perturbation of the local immunity of the oral cavity. As a part of the study was reviewed the level of sensitization of oral mucosa to fungal allergens immunospecifical IgE to Candida albicans and condition of the local immunity in content of sICAM-1 in oral fluid; was developed a new methodology of treatment of oral mucosal diseases, estimated treatment outcomes. Clinical and laboratory researches confirmed that our developed and patented method of treatment allows to achieve significant therapeutic effect.

Keywords: harmful factors of production, recurrent aphthous stomatitis, atrophic glossitis, atrophic chilitis, treatment of oral mucosal diseases.

INTRODUCTION

Problem of diagnosis, treatment and prophylaxis of oral mucosal (OM) diseases is an integral part of the actual problems of modern stomatology [1,2]. In view of etiology and pathogenesis peculiarities, tendency to backsets and sufficiently high biological grade, OM diseases hold a specific place in a structure of dental disease incidence rate. However, OM diseases is the least understood medical and social problem of stomatology both in our country and abroad [3,4]. Especially susceptible to OM diseases are people exposed to harmful factors of production. In works of many authors it is proved that aerogenic occupational pollution by harmful substances has significant consequences on health of workers, causing formation of chronic pathology of a respiratory and alimentary system, skin cover [5]. Long-time influence of a complex of harmful occupational factors in addition to overall health breakdown leads to serious pathologies of oral cavity organs specifically to OM diseases, a vermilion border, periodontal and dental tissue diseases [6].

The modern science and medicine achieved great successes in studying of the etiology and pathogenesis of diseases caused by negative impact of exogenous factors on the human body, its prevention and treatment. However, a lot of aspects remain understudied and require more detailed approach [7].

One of the actual directions in studying of an etiology, pathogenesis and development of the most effective minimal invasive methods of treatment and prevention of OM diseases is studying of sensitization to allergens [8]. In works of many authors it is proved the important role of sensitization in development of many etiological processes in a human body [9]. Working zone air contains a great number of fungal agents, which are severe allergens. More often development of human pathology is caused by a type of yeast called Candida, which is widespread in working zone air of poultry farm workers. Getting on OM, this yeast provokes sensibilization and local immunity changing [10].

Indicators of morbidity by the recurrent aphthous stomatitis (RAS), atrophic chilitis and glossitis in workers of complexes with harmful working conditions and interrelation of these diseases with local dysimmunity of an oral cavity and with immunospecifical sensibilization to fungal allergens were not analyzed earlier. Also the algorithm of treatment of such patients is not developed.

METHODS

We conducted complete stomatological examination of 183 workers at the ages from 25 to 52 years with work experience for over 5 years exposed to harmful factors of poultry production and terephthalic acid production. For the diagnosis Candidiasis and Candida carriers was carried out the sampling of the oral fluid (OF) and determined concentration of specific IgE to Candida albicans and sICAM-1, mucous membrane scraping. The new methodology of treatment of patients with OM diseases is developed and patented. Was carried out an analysis of treatment outcome.

Regardless of the diagnosis Candidiasis or Candida carriers, the workers were divided into two groups: the first group – workers with sensitization of OM to Candida albicans (higher level of immunospecifical IIgE to Candida albicans) and local dysimmunity of an oral cavity (higher level of sICAM-1), the second group – workers without sensitization of OM to Candida ablicans, indicators of immunospecifical IIgE to Candida albicans were defined within normal limits (concentration of immunospecifical IgE to Candida albicans in OF to 0,64±0,47 IU/ml) and local dysimmunity of an oral cavity, indicators of sICAM-1 in OF were defined within normal

limits (concentration of sICAM-1 in OF to 4,5±0,91 ng/ml).

At the first stages we used a classical method of treatment: all preventive and curative interventions we began with stomatological education, motivation of patients for carrying out courses of treatment and further preventive interventions. All patients received individual recommendations for oral care, then they were given an oral hygiene instructions. The following stage was an oral cavity sanation, amelioration of local traumatic factors: defective cusps, plombage and dental prosthesis; broken teeth extraction, balanced treatment and prosthetics. After oral hygiene instructions and carrying out professional hygiene, we carried out the treatment directed on elimination of the phenomena of inflammation. Local treatment consisted in processing of elements of injury three times a day after meals according to the following schedule: oral mucosa pain relief of Lidocaine solution 2%, processing of elements of injury by an antiseptic of Chlorhexidine solution 0,06%, by proteoclastic ferments – Chymopsin, Trypsin; after the beginning of epithelialization elements were processed three times a day according to the schedule: drying of elements of injury, antiseptic preparation of Chlorhexidine solution 0,06%, further by "Aevit" preparation for acceleration of an epithelialization. We included vitamins in general treatment schedule: vitamin A 33 000 IU (10 mg) per day; vitamin B2 0,01 gr per day, dividing into three intakes after meals with plenty of water; vitamin PP 25 mg once a day every 6 months. At the same time appoint the preparations normalizing a condition of local immunity – Levamisole 0,15 gr once a day 3 tablets per treatment, after 3-5 days the course of treatment repeats [5,6]. The whole 3 courses of treatment, that is 9 tablets.

To the patients having sensitization of oral mucosal to Candida albicans and local dysimmunity of an oral cavity (concentration of immunospecifical IIgE to Candida albicans in OF to 0,64±0,47 IU/ml and concentration of sICAM-1 in OF to 4,5±0,91 ng/ml) in a complex with a classical treatment, we performed adjunctive therapy according to our developed and patented methodology (Patent No. RU (11) 2 593 580(13) C1 d/d 10.08.2016), which consists in mucous application in location of lesions by Derinat solution 0,25%, further carried out laser impact by apparatus ALST-01 "OPTODAN" with laser radiation wavelengths – 0,85-0,98 μm, the exposure dose on each affected area of mucous is 2 minutes (total time corresponds to quantity of aphtha), first, in the 1st mode with a laser pulse power – 2 Watt and the pulsed laser frequency 80-100 Hz, course of treatment – 4 procedures. Also in a complex were prescribed oral-bath with water solution of Sodium deoxyribonucleate 0,25% twice a day domiciliary. Then at a stage of resolving it is applied the 2nd mode of radiation: with a laser pulse power – 0,5-1 Watt and the pulsed laser frequency 2000-3000 Hz, course of treatment – 2 procedures [11].

Mucous applications by Derinat (which has modulating influence on cellular and humoral components of immune system and nonspecific resistance of an organism) stimulates its response to viral, bacterial and fungal antigens, normalizing the regeneration processes. Demonstrating expressed lymphotropic effect, Derinat stimulates drainage detoxification function of lymphatic system, first of all in the area of inflammatory reaction. Derinat activates non-specific body resistance by optimizing inflammatory responses and immune responses to bacterial, viral and fungal antigens. The drug stimulates reparative and regenerative processes, has anti-inflammatory effect. Derinat can effect on spontaneous sloughing at diseased areas during fibrinous processes that promotes to quick epithelialization [12]. Inclusion of laser treatment by apparatus ALST-01 "OPTODAN" (with laser radiation wavelengths – 0,85-0,98 μm, the 1st mode with a laser pulse power – 2 Watt and the pulsed laser frequency 80-100 Hz, the exposure dose – 2 minutes) in a treatment complex during expressed inflammation decreases inflammation, improves microcirculation, metabolism. Then at a stage of resolving is used the 2nd mode of radiation (with a laser pulse power – 0,5-1 Watt and the pulsed laser frequency 2000-3000 Hz or 2-3 kHz) which increases tissue regeneration processes by means of increasing of mitotic activity of cells, acceleration of an epitelialization of pathological elements.

The usage of Derinat applications together with laser therapy in complex therapy of recurrent aphthous stomatitis allows to effect complex immunomodulatory, epithelizing and regenerative action due to increase of resistance of cell membranes to cytotoxic action of the medicaments and chemicals, used in complex treatment, reducing their toxicity. This allows to increase the resistance of the body to infections, to effect on phagocytosed cells and natural killer cells and to stimulate antibody formation. It has been established that as a result of the combined impact on immunity during recurrent aphthous stomatitis (RAS) of a complex of Derinat applications and laser therapy with different mechanisms of influence on an inflammation and factors of local immunity epithelialization terms are reduced, the pain rapidly disappears, improvement of general state, reduction in the number of backsets and extension of remissions till 10-12 months.

In the suggested way of treatment of RAS, atrophic chilitis and glossitis deposition of a Derinat by the method of applications contributes to activation of blood circulation in the microcirculatory bloodstream, clearance of fibrinous pellicle that prevents development of phase violations of microcirculation, fasten epitelialization; laser therapy by impact on an inflammation, microcirculation and a metabolism stimulates the processes of oral mucous tissue regeneration by means of increasing of mitotic activity of cells, acceleration of an epitelialization of pathological elements.

RESULTS

Workers of terephthalic acid production are diagnosed with the erosive form of leukoplakia, severe periodontic disease recurrence and recurrent aphthous stomatitis, also in this group is registered high incidence of atrophic chilitis and glossitis. Workers presented with significant changing in local immune competence of oral

cavity. During studying of the dental health in workers occupied in the conditions of unfavorable factors of poultry-farming production we registered high incidence of OM diseases: (RAS), oral lichen planus (OLP), chilitises.

The overwhelming number among OM diseases were patients with RAS (69 people) and atrophic chilitis and glossitis (75 people). To develop algorithms of treatment, these patients underwent microbiological research of scraping from lateral cheek area to determine concentration of yeast-like fungi Candida, was carried out sampling of the OF and were determined concentrations of immunospecifical IgE to Candida albicans and sICAM-1. After microbiological research (oral mucous membrane scraping) of patients with OM diseases, diagnosis the oral candidiasis is made to 56 workers (Candida albicans concentration 10^5-10^7 cfu/ml), diagnosis the Candida-carrier is made to 61 workers (Candida albicans concentration 10^3-10^4 cfu/ml), laboratory findings confirming the oral candidiasis and Candida-carrier of 27 workers was not found (Candida albicans concentration up to 10 cfu/ml).

From 144 workers with RAS, atrophic chilitis and glossitis at 73,9 % of workers (115 people) have a higher level of specific IgE to Candida albicans 5,02±0,48 IU//ml, at 26,1 % of workers (29 people) have a normal level of specific IgE to Candida albicans 0,52±0,36 IU/ml. The level of sICAM-1 at 85,6 % of workers (123 people) was 9,5±0,71 ng/ml, that is much more than norm indicators, the level of sICAM-1 at 14,4 % of workers (21 people) was within the normal range 4,3±0,91 ng/ml.

After treatment by a classical methodology, the positive effect up to 12 months was observed in the second group – 82,7 % of workers, and in the first group – only 15,3% of workers. After the first course of laser treatment combined with Derinat, 29,8 % of patients from the first group had positive therapeutic effect: the decreasing of hyperemia, the attenuation of pain syndrome and the decreasing of quantity of damaged elements. In a month was appointed the refresher course of treatment, the positive result was noted at 43,6 % of patients, after the third course of treatment was established long-lasting remission during 12 months at 75,4% of patients. Resistance of clinical effect was noted till 1 one year, then was assigned the refresher course of treatment.

After the treatment we carried out repeated sampling of the OF and microbiological research of scraping from the surface of OM at patients from the first group. The following data was obtained: the higher level of specific IgE to Candida albicans remained only at 17,6 % (12 people) of workers 4,3±0,66 IU/ml, at 82,4% (57 people) if fell to normal values 0,47±0,63 IU/ml. The higher level of sICAM-1 remained at 20,7% (29 people) 9,5±0,71 ng/ml, at 79,3% (115 people) decreased to norm limits 4,3±0,91 ng/ml.

After microbiological research of scraping from the surface of OM diagnosis the oral candidiasis is made to 15 workers (Candida albicans concentration 10^5-10^7 cfu/ml), diagnosis the Candida-carrier is made to 21 workers (Candida albicans concentration 10^3-10^4 cfu/ml), laboratory findings confirming the oral candidiasis and Candida-carrier of 108 workers was not found (Candida albicans concentration up to 10 cfu/ml).

DISCUSSION

During the complex stomatological examination and oral fluid study of people exposed to harmful factors of production was determined, that a great number of workers have the local dysimmunity of an oral cavity and immunospecifical sensibilization of a mucous tunic of the mouth to fungal allergens. That makes classical methods of treatment of oral mucosal diseases ineffective. Clinical and laboratory researches confirmed that our developed and patented treatment modality allows to achieve the pronounced therapeutic effect. The usage of this method allows to reduce period of treatment till 6 days and to increase remission till 12 months due to mucous applications with Derinat solution 0,25% and laser therapy in the regions of aphtha.

CONCLUSION

The offered technique allows to provide ambulatory treatment domiciliary with reduction of terms of patients disability.

Thus, this physiopharmacological method of the combined effect allows to influence over the local immunity of oral cavity and sensibilization of a mucous to different fungal agents and, as a result, leads to increasing of therapeutic effect.

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