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ORAL CAVITY HEALTH AND REMEDY OPTIONS TO STIMULATE EPITHELIZATION OF ORAL MUCOSA

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ABSTRACT

Oral mucosa is an inner lining of oral cavity, which maintains different functions including protection of epithelial integrity. Pathology of oral mucosa can develop in response to the action of pathogenic microorganisms, viruses, and various traumatic factors; it can be a result of systemic pathology of a patient as well. Pain and discomfort usually accompanies such conditions leading to decrease of patient wellbeing. The basis of the pharmacological regulation of the regeneration process is the stimulation of wound healing.

The aim is to summarize and discuss the spectrum of remedy options that are used to stimulate epithelization of oral mucosa. The overall goal of the paper is to provide full and comprehensive information for dentists and their patients about medicament variety, ways of theirs application and dosage.

Methods. Relevant literature from MEDLINE (PubMed), Google Scholar, and in open access journals which are published by Elsevier was selected using the following key words «oral mucosa», «epithelization», and «remedy» were used in various combinations by the year of 2023. In total there were found 48 papers. To the selected scientific papers we applied the inclusion and exclusion criteria to choose the relevant ones.

Results. A comprehensive study of the available information related to means and products for epitelization of oral mucosa was carried out. Different groups of drugs can be used to stimulate regeneration process. The choice is set on vitamins, steroid anabolic agents, nonsteroidal anabolic agents, biogenic stimulants, immunomodulatory drugs, non-specific regeneration stimulators of plant and animal origin.

Conclusions. A significant number of drugs for the treatment of inflammatory processes in the oral cavity are available nowadays on dental market. Numerous studies, both domestic and foreign, substantiates the effectiveness of their use in dentistry. Therefore, when choosing pharmacological drugs, preference is given to drugs with a complex effect, which locally affect various links of the pathogenetic mechanism of the occurrence of diseases and do not disturb human wellbeing.

KEYWORDS: topical retinoid, oral mucosa, epithelization, herbal remedy, oral cavity

Introduction. Occasionally oral cavity is described as a mirror which reflects the general state of human body. Oral mucosa is the place where early sings of many internal diseases manifest [1,2]. Pathology of oral mucosa can develop in response to the action of pathogenic microorganisms, viruses, and various traumatic factors; it can be a result of systemic pathology of a patient as well [3,4].

Today, infectious and inflammatory processes in the oral cavity are considered the most common in the clinical practice of a dentist. Pharmacotherapy of dental patients should comply with modern international clinical guidelines, which are based on evidence-based medicine [5,6]. This is a guarantee of quick and complete recovery of patients without complications.

The pathogenetic therapy of inflammatory diseases of the oral cavity includes drugs that stimulate tissue regeneration processes [7,8]. These means ensure the normalization of metabolic processes in tissues. They are used to improve epithelization processes, which complete the regeneration and scarring of periodontal pockets, ulcerated surfaces on the mucous membrane of the gums, etc. [9,10].

Mechanical stress is continuously subjected on the oral environment by actions such as eating, drinking and talking. The mouth is also subject to sudden changes in temperature and pH values, it must be able to adapt quickly [11, 12]. The mouth is the only place in the body which provides the sensation of taste. Due to these unique physiological features, the oral mucosa must fulfil a number of distinct functions such as secretion, sensation, digestion, improvement of mastication and chewing and protection.

The aim is to summarize and discuss the spectrum of remedy options that are used to stimulate epithelization of oral mucosa. The overall goal of the paper is to provide full and comprehensive information for dentists and their patients about medicament variety, ways of theirs application and dosage.

Materials and methods. For the present study, an electronic search was done using MEDLINE (PubMed), Google Scholar, and in open access journals which are published by Elsevier. Search words and phrases such as: «oral mucosa», «epithelization», and «remedy» were used in various combinations. Forty eight articles were found. For this review article, was performed a comprehensive literature search. The search considered works published from 2010 until 2023 by using the abovementioned key words.

Only relevant literature in English from the electronic search was selected for the present review. The inclusion criteria are as follows: (i) use of existing commercial materials or their modifications in dental praxis; (ii) full text journal articles written in English and Ukrainian; (iii) books and book chapters written in English; (iv) scientific works published in 2010 and later; (v) books and book chapters of highly rated publishers (Wiley, Elsevier and Springer). The exclusion criteria are as follows: (i) case reports (clinical trials); (ii) conference papers; (iii) materials published earlier than 2009; (iv) randomized controlled studies; (v) editorials.

(1) The search was carried out in MEDLINE (PubMed), Google Scholar using the keywords «topical retinoid», «oral mucosa», and «epitelization» in various combinations. In total, 48 records were found.

(2) The co-authors analyzed 48 records for compliance with the inclusion and exclusion criteria. Additional 9 records identified from hand searching. In total, 24 records were deleted, i.e., 33 records remained.

(3) All selected records were distributed among all authors for reading of the full text articles and preparation of the manuscript. The procedure is shown in Figure 1 in the PRISMA flowchart.

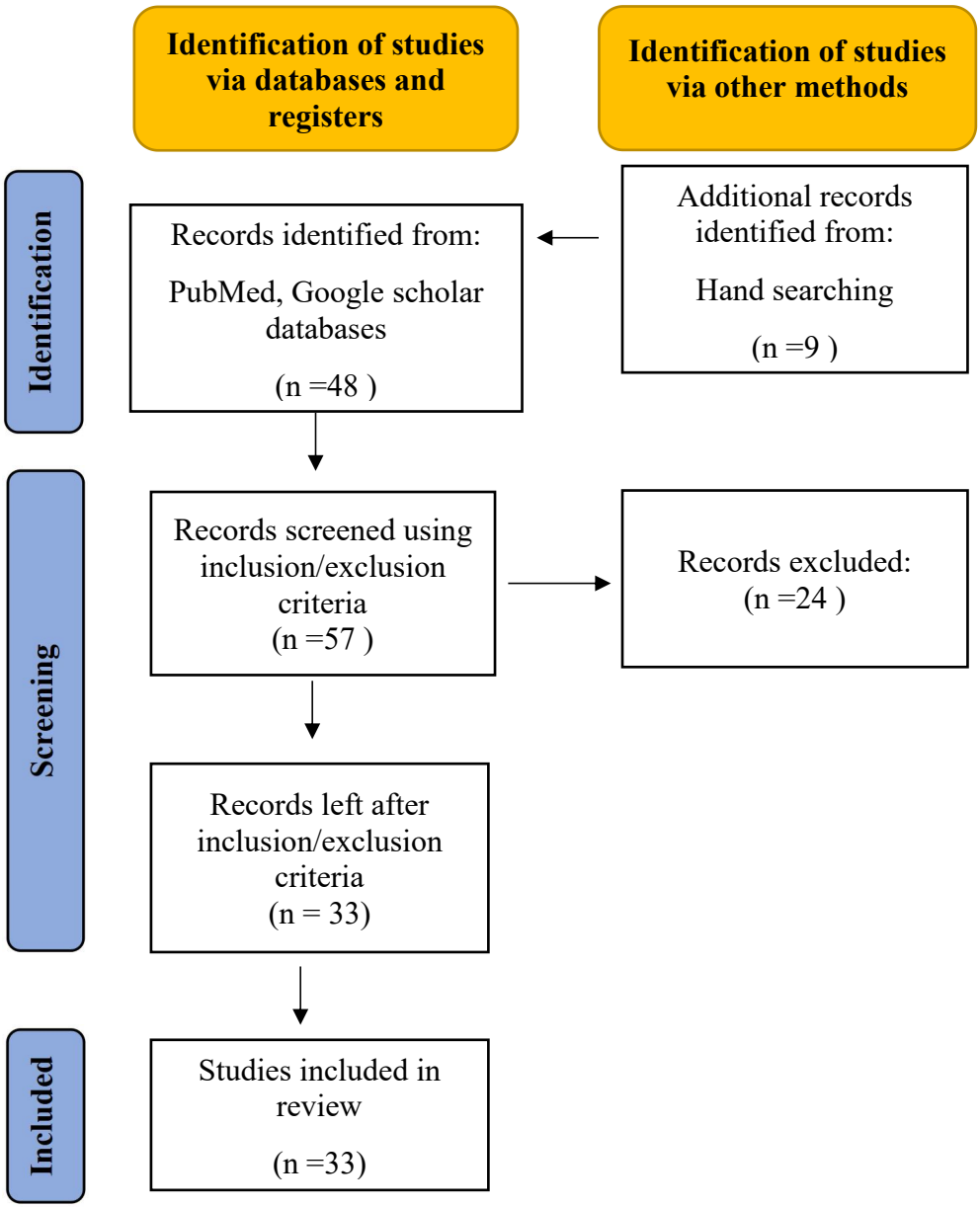

Figure 1. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram of inclusion/exclusion criteria.

Results. The oral mucosa is the mucous membrane lining the inside of the mouth. The oral mucosa has a large number of functions of clinical significance.

It acts as a protective physical and immune barrier from external stimulus and harbors minor salivary glands that secret saliva maintaining the wetness of the tissue, and perceives and responds to the stimulus of temperature, touch, and pain.

The basis of the pharmacological regulation of the regeneration process is the stimulation of protein synthesis and the activation of protective mechanisms that ensure the functioning of the body as a whole.

Different groups of drugs can be used to stimulate regeneration process:

1. Vitamins (especially vitamins of plastic metabolism - folic acid, vitamins B12, B6, B1, C, A, E, etc.);

2. Steroid anabolic agents (retabolil, methandrostenolone, phenobolil, etc.);

3. Nonsteroidal anabolic agents (sodium nucleicate, methyluracil, riboxin, potassium glycerophosphate, etc.);

4. Biogenic stimulants (Solcoseryl, honsuride, aloe, humizol, peloidin, placenta extract for injections, kombuten, etc.);

5. Immunomodulators (levamisole, thymalin, tactivin, prodigiosan, pyrogenal, polyoxidonium, proteflazid, lycopid, imudon, echinacea remedies);

6. Non-specific regeneration stimulators of plant and animal origin (buckthorn, rosehip, fir oil, as well as carotolin, apilak, propolis, rumalon, cerebrolysin, perga, etc.).

In clinical practice, a positive effect was noted in the majority of drugs of this group.

Vitamin A and topical retinoids increase the number of mitoses in epithelial cells, preventing the accumulation of keratohyalin in them. Retinol and its derivatives stimulate epithelialization, prevent excessive keratinization of the epithelium (hyperkeratosis) and the formation of scars. Vitamin A is considered as a natural component of epithelial cells, which supports the synthesis of RNA and sulfated glycosaminoglycans, which play an important role in the permeability of cellular and subcellular membranes. **Retinol acetate** (bottles of 10 ml of 3.44% and 6.88% oil solution). For local treatment, it is used in the form of applications and lubrication, taking into account the daily requirement, which is 1.5 mg. **Retinol palmitate** (10 ml bottles, 1 ml contains 100,000 IU) and vitamin A concentrate (10 ml bottles, 1 ml contains 100,000 IU of vitamin A) are used as applications or in the composition of periodontal dressings [13].

Aevit (1 ml ampoules, 1 ml contains 100,000 IU of vitamin A and 100 mg of vitamin E). Aevit is prescribed to stimulate the healing of ulcers. In addition, in the form of bandages and phonophoresis, it is prescribed for dyskeratoses, exfoliative cheilitis, and for some forms of eczema and leukoplakia, aevit is used both locally and intraorally for several months to increase the barrier function of the mucous membrane of the oral cavity.

Retinol (Retinolum) - vitamin A. Necessary for preservation of integrity and differentiation of epithelial cells. A 3.44% solution of retinol acetate in oil (Solutio Retinoli acetatis oleosa) and a 5.5% solution of retinol palmitate in oil (Solutio Retinoli palmitatis oleosa) are used to stimulate epithelialization processes of the oral mucosa. The drugs are used as applications on the damaged mucous membrane of the mouth 3-4 times a day. The duration of the application is 10-15 minutes, the treatment is carried out for 7-10 days.

Tocopherol acetate (Tocopheroli acetas) is involved in the biosynthesis of heme and proteins, cell proliferation. Stimulates processes of cellular metabolism, healing of soft tissue injuries. To accelerate the epithelization of the oral mucosa, 5%, 10% and 30% solutions of tocopherol acetate in oil are used in the form of applications on the damaged area of the oral mucosa lasting 10-15 minutes 3-4 times a day. The course of treatment is 7-10 days [14].

Aevitum is an oily solution containing 1 ml of retinol acetate 35 mg and tocopherol acetate 100 mg. It is used to accelerate the epithelization of the mucous membrane of the mouth as applications 3-4 times a day for 10-15 minutes.

Aecolum is a complex preparation, 100 ml of which contains: retinol acetate in oil 1.04 g, tocopherol acetate 0.18 g, 2-methyl-1,4-naphthoquinone (vitamin K preparation) 0.21 g, carotene (provitamin A) in oil up to 100 m Aecol is used to stimulate epithelialization of the oral mucosa in erosive and ulcerative lesions. Apply to the affected area 3-4 times a day for 10 minutes for 10-14 days.

Tigazon (aromatic retinoid) - 10 mg capsules. It is characterized by high biological activity, in terms of pharmacological action it is similar to vitamin A. It is used mainly for the treatment of lichen planus in the form of applications on lesions together with the intraoral drug intake.

Citral (1% alcohol solution in bottles of 30 ml) is chemically similar to the side chain of the vitamin A molecule. Apply 30-40 drops per 1/2 cup of water for rinsing, irrigation,

aerosol. In addition to plastic and stimulating effect, citral has a deodorizing, antiseptic, fungicidal, desensitizing and anesthetic effect.

Vinisolum is an aerosol preparation, which includes linetol - 14.9 g, vinylin - 15 g, citral - 0.1 g and propellant - up to 60 g. It is used in the treatment of trophic ulcers, radiation, chemical lesions and other erosive-ulcerative processes in the oral cavity. The drug is applied by spraying on the affected mucous membrane 1-2 times a day.

Anabolic steroid preparations, which promote protein synthesis, stimulate synthetic processes, enhance oxidative phosphorylation and the formation of macroergic compounds, have a much more pronounced effect on regeneration processes. Anabolic steroids are used for osteoporosis, bone fractures, dystrophies of various origins. **Retabolil,** which has a pronounced and long-lasting anabolic effect, increases appetite, improves well-being, and work capacity. Its effect is based on the strengthening of protein synthesis, the retention of calcium, potassium, phosphorus, and the reduction of cholesterol, β-lipoproteins, and phospholipids in the blood. It is used for trophic lesions, to enhance the healing of bone fractures of the maxillofacial region. Administer intramuscular 5% oil solution of retabolil at 0.025-0.05 g once every 2-3 weeks. 8-10 injections per course. **Phenobolil** has properties similar to the previous drug. It is indicated for generalized periodontitis in patients with asthenic syndrome, fractures, trophic ulcers of the mucous membrane of the oral cavity. The drug is prescribed intramuscular at 1-2 ml once a week. The course of treatment is 3-5 injections. **Methandrostenolone** is prescribed according to indications similar to phenobolil, for 1-2 months.

Nonsteroidal anabolic agents include drugs that stimulate the biosynthesis of nucleic acids and are their precursors or products of partial hydrolysis. They do not have hormonal activity and have low toxicity. By increasing the synthesis of nucleic acids and proteins, stimulating cell division, they accelerate regeneration processes, promote wound healing, and make the scar more plastic [15]. They activate specific and non-specific immunity.

Sodium nucleicate and methyluracil have a stimulating effect on metabolic processes - the synthesis of nucleic acids and protein metabolism. They accelerate the reproduction and growth of cells, wound healing, restoration of the mass and function of damaged organs, activate leukopoiesis, contribute to the creation of antibodies, lysozyme and complement. They are prescribed in the complex therapy of acute ulcerative-necrotic processes, trophic ulcers, burns, fistulas, fractures of orofacial area, osteomyelitis, etc.

Acemin (Acenunum) - sodium salt of e-acetyl-non caproic acid. Has the ability to accelerate the cleaning of erosive-ulcerative surfaces from necrotic masses, reduces exudation, enhances tissue regeneration and epithelization.

It is used in the treatment of trophic ulcers that do not heal for a long time, ulcerative-necrotic lesions of the mucous membrane of the mouth. Acemin is used in the form of 5% ointment and 25% solution. The drug is applied to the ulcer surface previously cleaned of necrotic plaque 1-2 times a day for 10-30 days until epithelization. The use of acemin is contraindicated in case of abundant purulent discharge from the affected area, as well as during pregnancy.

Biogenic stimulators have an effective effect on metabolic, bioenergetic, enzymatic processes, as well as stimulation of regeneration in general.

Solcoseryl is a deproteinized extract from the blood of calves. Activates tissue metabolism, stimulates ATP synthesis, thereby accelerating the regeneration of damaged tissues. In dental practice, it is prescribed for stomatitis, gingivitis, periodontitis, burns and decubitus ulcers of the mucous membrane, ulcer-necrotic processes, alveolitis, injuries. It is administered intramuscularly and intravenously or applied locally in the form of an ointment, jelly or dental adhesive paste.

Solcoseryl is used to accelerate epithelialization of the oral mucosa and skin in case of mechanical, thermal, and chemical trauma, inflammatory periodontal diseases (gingivitis, periodontitis), recurrent aphthous stomatitis, viral lesions of the oral mucosa, etc. For this purpose, Solcoseryl is used in ointment or 10% jelly, which is applied in a thin layer to the damaged surface of the mucous membrane of the mouth or skin 2-3 times a day. Applications are carried out within 15-20 minutes. For the course of treatment - 5-10 applications before the onset of epithelization of the affected surface. In some cases, applications of Solcoseryl jelly may be accompanied by a burning sensation, which is not an indication for withdrawal of the drug.[16]

Solcoseryl dental adhesive paste is used in the treatment of inflammatory periodontal diseases (gingivitis and periodontitis). It has an anti-inflammatory and stimulating epithelization effect. The paste is used as a periodontal bandage for gingivitis, as well as in the pre- and post-operative period of treatment of generalized periodontitis [17].

Due to the strong adhesion of the paste to the mucous membrane, a protective film is formed, which reduces the irritating effect of food. Indications: oral mucosa diseases (erosions, aphthae, ulcers); in case of periodontal tissue disease, after periodontal surgery; traumatic lesions of the mucous membrane; with complicated teething. Contraindications: hypersensitivity to the components of the drug. How to use: apply the paste to the dry affected area and rub with a finger dipped in water. The procedure should be carried out 3-5 times a day for 14 days. It has been shown that treatment with the drug "Solcoseryl" with the help of drops, in a short period of time (5-7 visits), effectively affects the mechanisms of the development of periodontitis and shows a stable therapeutic effect [18].

Actovegin is a deproteinized calf blood extract with low-molecular-weight peptides and nucleic acid derivatives. Actovegin improves oxygen supply to tissues, activates metabolic processes, and accelerates regeneration of tissues, including the mucous membrane of the mouth. It is used to treat erosive-ulcerative lesions of the oral mucosa (traumatic, trophic ulcers, allergic, viral erosive-ulcerative lesions, lichen planus, etc.). Actovegin is used in the form of 20% jelly, 5% cream or 5% ointment for applications on affected areas 2-3 times a day for 10-15 minutes. The course of treatment is 10-15 applications.

Humizol accelerates tissue regeneration, so the drug is used for trophic ulcers and chronic erosive-ulcerative lesions of the mucous membrane of the oral cavity. Administer 1-2 ml intramuscular once a day. Suspension and placenta extract increase the body's protective properties and accelerate wound epithelization. It is used to increase the immunological reactivity of the body and for chronic erosive-ulcerative lesions of the mucous membrane. **Plasmol** has a non-specific analgesic effect, it is used for symptomatic stomatitis that developed as an oral manifestation of a duodenal ulcer, trigeminal neuralgia, pain syndromes, etc. **Honsuride** is a drug obtained from the hyaline cartilages of cattle tracheas, participates in the formation of connective tissue, and stimulates reparative processes. It is prescribed for sluggish regeneration processes, trophic ulcers, bedsores. The collagen film accelerates regeneration processes and has antiseptic properties. It is used locally for ulcer or erosion. Liniment and aloe juice improve tissue regeneration and epithelization. They are applied in a thin layer to erosive-ulcerative or radiation lesions of the mucous membrane of the oral cavity or lips. **Kombuten** is a drug obtained from the Achilles tendons or skin of cattle. The drug stimulates reparative processes in the wound, accelerates the growth of granulations and epithelization. **Rumalon,** containing an extract from the cartilage of young animals and bone marrow, is used for joint diseases accompanied by degenerative changes in the cartilage tissue of the joints. Glucosamine is involved in the biosynthesis of hyaluronic acid proteoglycans. The drug has a chondroprotective effect, promotes the deposition of calcium in bone tissue. It is used for osteoarthritis of the temporomandibular joint, osteochondrosis, spondylosis, periarthritis.

Apilac (royal milk of bees), propolis (bee glue), honey and perga (honey with a high content of plant pollen) in dental practice can help stimulate regeneration, improve trophic processes, increase immunity, etc. Drugs are used for the treatment of wounds, ulcers, aphthae, and erosions that do not heal well. Propolis is used as an anti-inflammatory, pain reliever. Its 4-20% alcohol solution is used to anesthetize the hard tissues of the tooth [19].

Propolis is bee glue, a product of bees' vital activity. It is a resinous sticky substance, greenish-brown or dark brown in color with a specific aromatic smell. Its main components are vegetable resins (50-55%), essential oils (8-10%), wax (about 30%) and other substances. Contains mineral elements (iron, copper, manganese, zinc, cobalt, etc.). It has an analgesic, anti-inflammatory and antimicrobial effect. Almost insoluble in water, soluble in alcohol. Aerosol drug "Proposol" is used in dental practice [20].

Aerosol "Proposol" is a transparent liquid of dark color with a balsamic smell. It is used as an antiseptic, anti-inflammatory, analgesic and epithelization-stimulating agent for catarrhal and ulcerative-necrotic gingivitis, erosive-ulcerative lesions of the oral mucosa, trophic ulcers.

It is used to irrigate the mucous membrane of the mouth in the affected area 2-3 times a day during the acute period of the disease and 1-2 times a day when the acute symptoms subside. The course of treatment is 3-7 days.

One aerosol can (50 g) contains propolis of 2.1 g, distilled glycerin 4.9 g, rectified ethyl alcohol 28 g, fuel (Hladon-12) 15 g.

"Propoceum" ointment containing 10% propolis extract is also produced. This ointment is indicated for trophic ulcers on the skin and mucous membrane of the mouth. It reduces pain, has an anti-inflammatory effect, promotes rapid epithelization of erosions and ulcers on the oral mucosa.

Tincture of propolis is a 10% solution of propolis in 80% ethyl alcohol. It is applied locally as an antimicrobial, anti-inflammatory and stimulating agent for the regeneration of the mucous membrane of the mouth. Propolis tincture is used in dentistry to treat root canals in periodontitis, as well as to treat catarrhal and erosive-ulcerative processes in the oral cavity - gingivitis and stomatitis. After antiseptic treatment of the oral cavity and removal of necrotic tissues with the help of proteolytic enzymes, an alcohol solution of propolis is used in combination with an oil solution of vitamin A (in equal quantities) for applications on the affected mucous membrane of the mouth. The duration of the application is 10-15 minutes. This accelerates the regeneration processes of the oral mucosa [21].

Mumio is an ancient "miracle balm" used in folk medicine. The drug contains a large amount of micro- and macroelements, metal oxides, vitamins, essential oils, bee venom, resins, etc. It stimulates the processes of regeneration, activates the healing processes of wounds and fractures, has anti-inflammatory, anti-toxic and tonic effects. [22].

Sea buckthorn oil, rosehip oil and carotolin (oil extract of carotenoids from rose hips) stimulate regeneration processes. The preparations contain unsaturated and saturated fatty acids, carotenoids, tocopherols, vitamins of group B, C, P, etc. It is used to accelerate the healing of wounds, burns, trophic and radiation ulcers. Sea buckthorn oil is used intraorally for 1 teaspoon 2-3 times a day for 1 month. These drugs are used topically for applications, inhalations or instillation into periodontal pockets. Juices, decoctions, infusions and tinctures of medicinal substances (St. John's wort, Kalanchoe feathery, plantain, marigold, comfrey, Japanese sophora, etc.) stimulate regeneration processes and have an anti-inflammatory effect [23]. It is prescribed for the treatment of infectious and inflammatory processes of the mucous membrane and throat, periodontal tissues, wound and burn lesions in the form of applications, baths, and oral rinses. Sea buckthorn oil (in bottles of 100 ml) contains a mixture of carotene and carotenoids (a-, b-, g-), tocopherols, lycopene and glycerides, oleic, linoleic, palmitic and stearic acids. Stimulates the processes of regeneration of the mucous membrane of the oral

cavity, has anti-inflammatory, bactericidal and pain-relieving effects. As a natural antioxidant, it suppresses the processes of lipid peroxidation, preventing the catabolism of nucleic acids and proteins, and therefore, the process of tissue decay. With regular use, sea buckthorn oil improves the state of "protection factors", barrier function, regional blood circulation, regeneration processes and the immune status of the body. Used for lubrication of oral mucosa, applications and periodontal bandages. Sea buckthorn oil (Oleum Hippopheae) is obtained from sea buckthorn fruits and leaves. Contains a mixture of carotene and carotenoids, tocopherols, chlorophyll substances and glycerides, liolenic, oleic, palmitic, stearic acids. Sea buckthorn oil accelerates the healing of erosions and ulcers, and also helps to increase the resistance of the mucous membrane of the mouth. It is used in the treatment of radiation lesions of the mucous membrane of the mouth, trophic ulcers, erosive-ulcerative form of lichen planus and other diseases of the mucous membrane of the mouth and lips, accompanied by the occurrence of erosions or ulcers. The drug is used in the form of applications on the area of erosion or ulcers for 10-15 minutes 3-4 times a day. The course of treatment is 10-15 procedures. Herbal extracts have been used in dentistry for reducing inflammation, for inhibiting the growth of oral pathogens, for preventing the release of histamine, and as antiseptics, antioxidants, and analgesics [24].

"Oblecolum" biofilm (Membranula "Oblecolum") is a plate made of collagen with the addition (1: 100) of sea buckthorn oil. It is used in the treatment of erosive and ulcerative processes on the mucous membrane of the mouth. The film is placed on the surface of the erosion or ulcer for 2-3 hours, as a result of which the healing effect of sea buckthorn oil is prolonged and healing is more intensive. Along with this, the film protects the surface of the affected mucous membrane of the mouth from various mechanical and thermal stimuli, which also stimulates the process of epithelization.

The surface of erosion/ulcer should be cleaned from fibrinous or necrotic plaque before applying of the biofilm. The film is pre-cut according to the size of the lesion and placed in a sterile isotonic solution of sodium chloride or furatsilin. The course of treatment is from 3 to 15 applications.

Rosehip oil (in bottles of 100 and 250 ml) contains unsaturated and saturated fatty acids, carotenoids, and tocopherols. It is used in the same way as sea buckthorn oil. **Carotolinum** (in bottles of 100 and 250 ml) is an oil extract from the rose hips. The therapeutic effect is due to the content of tocopherols, unsaturated fatty acids, etc. It is used in the same way as sea buckthorn oil. It is used for the treatment of traumatic, trophic, allergic and other erosive-ulcerative lesions of the oral mucosa.

Chlorophyll-carotene paste (obtained from pine needles). The healing effect is due to the presence of carotenoids, chlorophyll, vitamin E, phytosterols, and terpenes. A 30% aqueous solution is used for applications (for 15-20 minutes 2 times a day).

Rosehip oil (Oleum Rosae) is an oil obtained from rosehip seeds. Contains saturated and unsaturated fatty acids, carotenoids, tocopherols. It is used to stimulate the processes of epithelization of the mucous membrane of the mouth in case of traumatic, trophic and other erosive-ulcerative lesions. The drug is applied to the area of erosion or ulcers 3-4 times a day for 10-15 minutes until full epithelization occurs.

Aerosol "Livian" (Aerosolum "Livianum") contains linetol 69.45 g, fish oil 20 g, a-tocopherol acetate 0.01 g, anesthesin 2 g, ciminal 0.05 g, sunflower oil 2.99 g, lavender oil 0.5 g alcohol 95% 5 ml. It is applied by spraying on the affected surface of the mucous membrane of the mouth.

Liniment "Spedianum" (Linimentum "Spedianum") contains spermaceta 7 g, anesthesin 1 g, dicain 0.005 g, spermaceta oil up to 100 g.

Olasolum is a combined aerosol preparation, which includes sea buckthorn oil, chloramphenicol, anesthesin, boric acid, fillers. Olazolum has an antimicrobial and

epithelization-stimulating effect. The drug is applied to the surface of erosions and ulcers, previously cleaned from plaque (fibrinous or necrotic) 2-4 times a day for 7-10 days. Olazolum is used in the treatment of ulcerative-necrotic stomatitis and gingivitis, trophic ulcers, streptococcal and staphylococcal fissures, etc. [26]

Gnaosol (Hiposolum) is a combined drug produced in an aerosol package. A 55 g cylinder contains: sea buckthorn oil - 15 g, methyluracil - 1 g, sodium ethazol - 1 g and various fillers. The drug has an anti-inflammatory, antimicrobial and epithelization-stimulating effect. It is used to treat diseases of the oral mucosa characterized by erosive-ulcerative processes (traumatic lesions, lichen planus, multiform exudative erythema, etc.) [27,28]. **Hiposol AN** is applied to the surface of erosions or ulcers previously cleaned from fibrinous and necrotic deposits, 1-2 times a day for 10-15 days until epithelization.

Vinylin (Shostakovsky balm) is polyvinyl butyl alcohol. It is used in the treatment of erosive-ulcerative lesions and inflammatory processes of the mucous membrane of the oral cavity both separately and in the composition of liniments and emulsions. **Vinisol** is an aerosol preparation containing vinyl, linetol, citral. It is used in the treatment of inflammatory processes of the mucous membrane of the oral cavity and trophic ulcers. The drug is applied by spraying over the affected mucous membrane, 1-3 times a day.

Aniline dyes: 1% aqueous or glycerol solution of methylene blue, methylene blue with glucose (1 g of methylene blue + 50 ml of 40% glucose), Fucorcin (Castellani liquid), ethacridine lactate (rivanol) – 1:500, 1:1000 ; methyl violet (pioctane 1%). Used for lubrication and applications.

Lioxazole (aerosol canisters of 50 or 25 g) is used as a means of preventing the development and treatment of acute local radiation lesions of the skin and mucous membrane of the oral cavity of the I-II degree, which occur as a result of radiation therapy or radiation trauma. Lioxazole prevents the appearance of early spasm of the arteries of the deep vascular plexus, which occurs under the influence of ionizing radiation, improves blood supply in the focus of irradiation and accelerates reparative processes in the epithelium. The drug is applied to the lesion in a thin layer. For prevention, it is used immediately or no later than 1 hour after the radiation session, during the entire course of radiotherapy. It is also used to treat the first clinical signs of radiation injure to the mucous membrane of the oral cavity (once a day).

Dibunol (5% liniment) is used for burns of various etiologies, as well as for trophic and radiation ulcers that do not heal for a long time, sluggish course of postoperative and traumatic wounds. In addition, it is prescribed for frostbite, including for the management of patients after cryodestruction of pathological processes of the mucous membrane of the oral cavity. [29]

Linetol is a preparation made from linseed oil. It is used as a 5% ointment for erosive-ulcerative lesions of the mucous membrane of the oral cavity to improve epithelization. Linethol (Linaetholum) has the ability to stimulate the regeneration of damaged tissues. It is used for radiation damage to the mucous membrane of the mouth (focal and draining membranous radiomucositis), chemical, thermal and other damage. Linetol is applied in a thin layer to the affected surface of the mucous membrane of the oral cavity, 1-2 times a day. Linetol is a part of the aerosol preparations "Vinisol", "Livian", etc. [30]

Kalanchoe juice (Succus Kalanchoes) is obtained from fresh leaves and the green part of the stems of the feathery Kalanchoe plant. It has an anti-inflammatory effect, helps to clean ulcers from necrotic tissues, and stimulates their healing. In dental practice, they are used as applications on the affected areas of the oral mucosa 3-4 times a day. The course of treatment is 10-15 applications [31,32].

Kalanchoe juice is used in the treatment of periodontal diseases (catarrhal, ulcerative-necrotic gingivitis, periodontitis), aphthous stomatitis, chronic cracked lips and other diseases of the oral mucosa characterized by ulcerative-necrotic lesions.

Fogemum. Produced in tubes of 30 g. Contains hemin (hemoglobin component), dimexide, calcium stearate, distilled water. The drug has photoprotective activity and is able to prevent the development of photodynamic inflammation. It is used for lesions associated with a violation of porphyrin exchange, and as a therapeutic and preventive measure for lupus erythematosus, solar eczema, and actin-allergic cheilitis. Patients rub ointment into previously washed skin of the face and lips: on the 1st week - 3 times a day, on the 2nd week - 2 times, then - 1 time every 2-3 days [33,34].

Pharmacotherapeutic measures in patients with diseases of the oral cavity are aimed to influence the cause of the disease development - etiotropic treatment; mechanisms of the development of pathological processes in periodontal tissues and periodontal disease - pathogenetic treatment and clinical manifestations of the disease - symptomatic treatment.

Conclusion. To date, a significant number of drugs have been developed and dental market offered them for the treatment of inflammatory processes in the oral cavity. A large number of studies, both domestic and foreign, substantiates the effectiveness of their use in dentistry. Therefore, when choosing pharmacological drugs, preference is given to drugs with a complex effect, which locally affect various links of the pathogenetic mechanism of the occurrence of diseases and do not cause complications of human organism in general.

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