STUDY OF THE PHARMACOLOGICAL EFFECTS OF THE DENTAL DRUGS "CHOLIDENT" AND "LYSODENT C"

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Introduction. One of the most actual problems of modern dentistry is infectious and inflammatory diseases of the periodontium, oral mucosa, as well as pathologies of similar etiology that occur when using prostheses of various designs. Caries remains the most common disease of the teeth hard tissues, and other dental diseases can develop as a result of its complications. In addition, recently, xerostomia has become a quite frequent pathological condition that suppresses the defense mechanisms of the oral cavity and the whole body.

It has been proven that dental pathologies have a multifactorial etiology, and therefore require the use of topical medicines with multimodal effect: antimicrobial, anti-inflammatory, analgesic, reparative, etc.

Among the promising dental dosage forms for oral use, which have a number of advantages and realize a multifactorial, prolonged effect on the tissues of the oral cavity, are gels and medicated chewing gums (MCG).

Aim of the study. To study the pharmacological effects of the developed dental drugs: "Cholident" in the form of a gel, containing as an API the tincture "Phitodent", choline salicylate and lidocaine hydrochloride, and "Lysodent C" in the form of MCG, containing as an API lysozyme hydrochloride and ascorbic acid.

Research methods. Analgesic and anti-exudative (anti-inflammatory) activity of gel "Cholident" was studied on male rats using the Randall-Selitto model of kaolin edema using an electronic analgesiometer (Pressure Analgesiometer, Almemo®, Germany) and an electronic plethysmometer (Plethysmometer, WPI, Italy), respectively, in comparison with dental gel "Kamistad®" (Germany). The reparative activity of the gel was studied on the thermal burn model. In the MCG "Lysodent C", the following were investigated: anti-proliferative effects of APIs on cultured cells (HepG2, Hek293 and MAEC); the effect of APIs on salivary parameters and the functional state of salivary glands of rats with experimental atropine-induced xerostomia. The study was conducted in accordance with Directive 86/609/EC of the European Parliament and the Council of the EU dated November 24, 1986 "On the approximation of laws, regulations and administrative provisions of the EU state on the protection of animals used for experimental and other scientific purposes", the Directive of the European Parliament and EU Council 2010/63/EU of September 22, 2010 "On the protection of animals used for scientific purposes".

Main results. Despite having a lower lidocaine concentration (1.5%) than the reference drug (2.0%), the dental gel "Cholident" provides a stronger antinociceptive effect immediately after application and restores the pain threshold faster, demonstrating a reliable pain-relieving effect. In the carrageenan foot edema rat model, "Cholident" significantly reduced local inflammation, showed moderate anti-exudative effects 1.5-2 hours after the phlogogenic agent was introduced, and had a longer-lasting effect compared to "Kamistad®." Additionally, "Cholident" promoted reparative processes and reduced local inflammation, as evidenced by

increased mitoses and angiogenesis in a burn wound model.

The individual and combined effects of MCGs' APIs on Hek293 human embryonic kidney cells showed no toxic antiproliferative effects. In HepG2 cell cultures, ascorbic acid and lysozyme hydrochloride in prescribed concentrations enhanced antioxidant protection and prevented oxidative stress, a key factor in periodontal inflammatory diseases. Neither lysozyme hydrochloride, ascorbic acid, nor their combination affected cell morphology, confirming the safety of API concentrations and no side effects on cell viability. In rats with atropine-induced xerostomia treated with the lysozyme hydrochloride and ascorbic acid solution, spontaneous salivation, parotid and submandibular gland mass coefficients, and antioxidant status in the submandibular gland were restored to levels similar to intact animals.

So, the established pharmacological effects of the developed drugs in the form of dental gel and MCG and, accordingly, the indications for their use can be presented in the general scheme shown in Fig. 1.

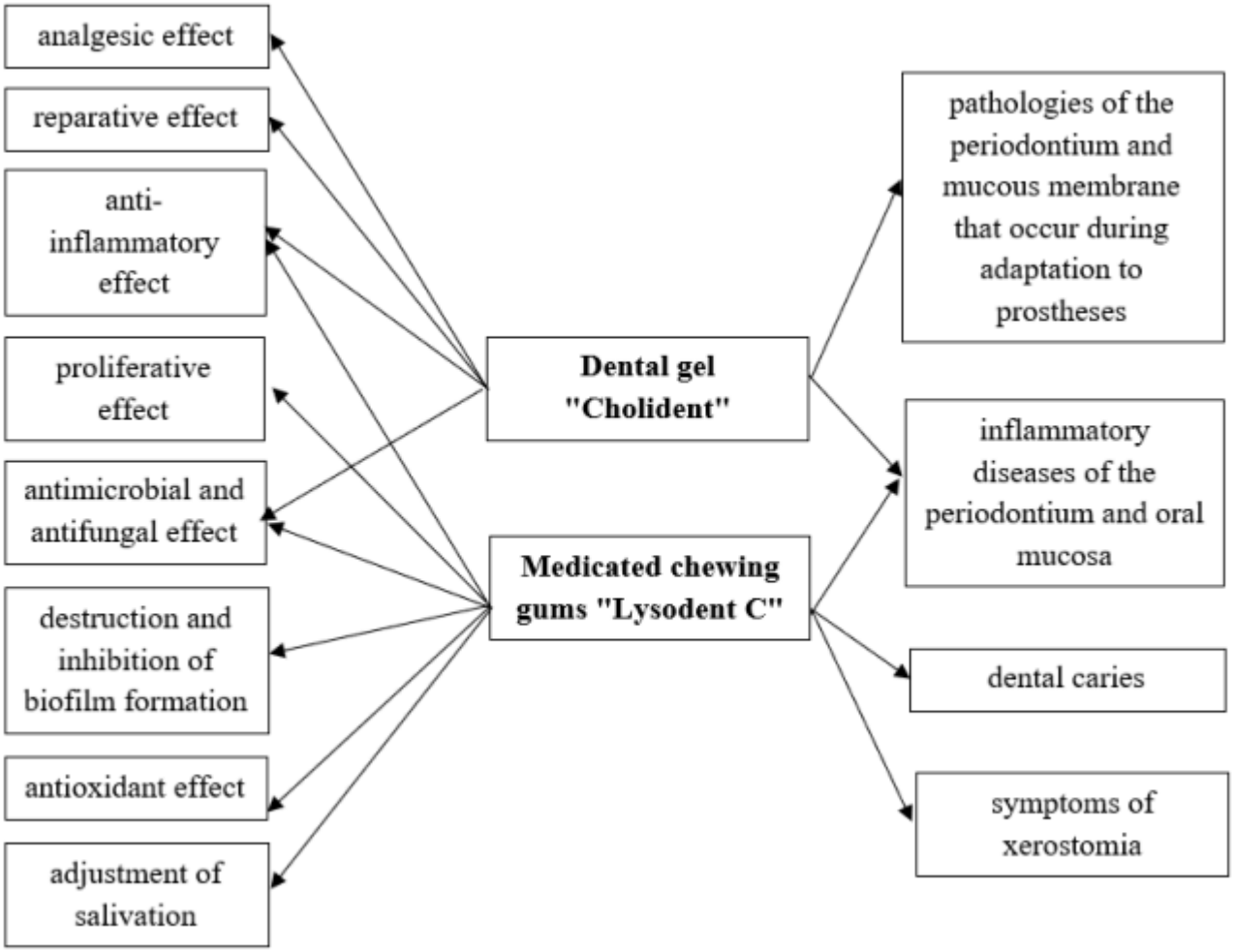

Fig. 1. Schematic representation of the relationship between the developed dental drugs pharmacological effects and indications for their use

Conclusions. Thus, both dental drugs that are developed, due to their multimodal effect, can be used in combination or alternately in the prevention and treatment of inflammatory periodontal diseases and oral mucosal diseases.