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REVIEW ARTICLE

Development of Children's Gel from Nettle Burn

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ABSTRACT
It is shown the process of searching and developing the new drug from old drugs and compounds for example an alkaline isotonic gel containing hydrogen peroxide, lidocaine hydrochloride and a cationic surfactant at pH 8.4 - 8.5. It was found out that when applied to the skin in conditions of local hyperthermia, the invented gel quickly disinfects the skin, moisturizes, impregnates, steams, softens, loosens the epidermis, facilitates the removal of prickles from it and prevents local inflammation caused by nettle. Gel causes alkaline saponification and oxygen "micro-explosions" of biomaterials from cold boiling due to the conversion of hydrogen peroxide under the action of the catalase enzyme into gas oxygen and water. These numerous microbursts successfully destroy protein and protein-lipid complexes that make up such biomaterials of the skin's surface layer as epidermis cells, sweat, pus, living and dead blood cells, and microorganisms, including viruses. In addition, the gel due to lidocaine hydrochloride has a local anesthetic, analgesic and antihistamine effect. This gel can protect children's skin from itching, pain, swelling, blisters, burns, infection, local inflammation of an allergic and physical-chemical nature at the site of contact with stinging plants due to local hyperthermic alkaline skin stripping and deactivation of organic acids, oxidative deactivation of histamine and other biogenic amines, and inhibition of all receptors in the skin. The role of all ingredients is described in detail.
Key words:*nettle burn,hydrogen peroxide, lidocaine hydrochloride, gel,drug, development.*

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An alkaline isotonic gel containing hydrogen peroxide, lidocaine hydrochloride and a cationic surfactant is offered as a children's emergency aid for nettle burn.

INTRODUCTION

In connection with the COVID-19 pandemic, many people around the world are very concerned about infection with the new coronavirus not only through the respiratory and digestive systems due to inhaled air and food consumed, but also through exposed skin due to endless and uncontrolled contact with non-sterile surfaces of various household and industrial items.[1,2] Therefore, for the purpose of personal hygiene, not only face masks, respirators and disinfected food products are used, but also hand gloves and household antiseptics.[3,4]However, this is not enough, since the exposed parts of the body cannot be completely closed for all 24 hours a day. Therefore, the skin on areas of the body such as the forehead, cheeks, ears, neck, ankles, and wrist can be accidentally and unexpectedly infected. Especially since spring has already arrived in the Northern hemisphere, which turns into summer. This increases the frequency of people getting insect bites, stinging plant burns, in particular nettles, as well as minor injuries such as scratches, abrasions, bruises and sunburn.[5] These skin lesions can make it easier for pathogens of various infectious diseases, including COVID-19, to enter the human body.[6,7] In this case, the virus can be

effectively and safely removed and/or inactivated only when the skin in the "right" place will bi immediately treated with a special local antidote-antiseptic.

Unfortunately, there are no ready-made medicines for skin burns with nettle and other burning plants that can capable simultaneously with such an action to protect the human body from the penetration of the coronavirus through damaged skin areas among the well-known personal hygiene and emergency care products.[8,9] It should be added that after application to the skin, known disinfectants remain on it for a very long time.[10] However, to prevent infection with coronavirus through damaged skin, it is not necessary to apply an antiseptic for a very long time on an open area of the skin. The fact is that the long-term presence of known remedies on the skin often worsens the quality of the skin and the aesthetic result of treatment. In addition, long-term local interaction of known antiseptics and long-term retention of their ingredients on the skin is very undesirable for the treatment of children's skin,which is the most delicate and susceptible to any effects,[11, 12] and also undesirable for the treatment of skin in pregnant women, since the greater stability of the ingredients and the duration of interaction increases the risk of their undesirable effects on the fetus.[13]

The purpose of this work is demonstration of the development history of children's gel for urgent treatment of nettle burns and protection of the body from infection, including SARS-COV-2.

MATERIAL AND METHODS

A thorough study of scientific literature and inventions was conducted between 2005 and 2019 using the Google Patents, EAPATIS, RUPTO, USPTO, Espacenet, PATENTSCOPE, PatSearch, DWPI, E-Library, Google Scholar, Scopus, PubMed, Questel-Orbit, Science Direct and Yandex databases. The results were analyzed, prioritized and summarized.Keywords of the search strategy: unguent, hand's cream, hand's gel, gel for the skin, cream-gel, children's body milk, baby soap, baby shampoo, antiseptic, disinfectant means, decontaminating mean, recipe, composition, COVID-19, SARS, MERS, coronavirus, insect bite, nettle burn, organic acid burn, splinter, prickle, plant poisons, histamine, formic acid, ingredients of ointments, hydrogen peroxide, lidocaine hydrochloride, sodium hydrocarbonate, local antidote, local irritant, local skin inflammation, anti-inflammatory drugs, corticosteroids, antihistamines drugs, local anesthetics, local hyperthermia, antipruritic drugs, analgesic drugs. The information was limited to being applied to the skin of children and pregnant women to decontaminate it and protect the body from coronavirus, as well as to prevent local irritating effects, including nettle burn. In the article for review 19 inventions were evaluated.

RESULTS

We analyzed the scientific literature on the search and development of new drugs. The results of the analysis showed that researchers still use different ways to find and develop new medicines. It is shown that the detection of a promising compound using the traditional search path will require screening of at least 100 new original chemical compounds, which will take at least 12 years and will require 800 million USD.[14-16]

It was found out that cheaper and faster to develop a new drug if you use a new, therefore still unconventional way of finding and developing new drugs, which is associated today with biopharmacy. It is shown that a distinctive feature of this way of searching for new drugs is that it does not require the mandatory presence of new chemical compounds. Moreover, this search path allows to do screening the same "old" (known) drug or substance, but with changed physical and chemical properties.[17]In this regard, this way of searching and developing new drugs is based on the study of a finished pharmaceutical product, such as a tablet, ointment, solution for injection, etc., rather than a pure chemical substance.Therefore, the studied product must contain auxiliary, forming substances and substances that correct the taste, color and smell, and not only the main active substance. All this speeds up the detection of a promising pharmaceutical product.

In this regard, to achieve this goal, we decided to explore the possibility of developing a new drug from old medicines, but with changed physical and chemical properties. So first it was decided to choose the "old" antiseptic. When choosing, we assumed that this antiseptic should be easily available to all segments of the population. In addition, the chosen antiseptic should be cheap and very safe. Moreover, the safety of the antiseptic should be certain, since it was planned to create a drug based on it that could be applied to the skin of children and pregnant women. Finally, this remedy should have a long and immaculate history of medical use as an antiseptic to fight infectious agents, including viruses. The next criterion of our choice was the rapid destructibility of the antiseptic after applying it to the skin and the high safety of its metabolites.

We have studied the well-known antiseptics with a view of these criteria. The drug of choice was hydrogen peroxide. The advantage of hydrogen peroxide solution is that it is used for a long time in medicine, veterinary medicine, industry and trade as a universal decontaminating, discoloring and short-lived agent, whose metabolites are completely safe and even edible.[19] It was shown that the solution of hydrogen peroxide, with surfactant, stabilizer and local analgesic, was recommended to create a stable peroxide foam that was intended to treat minor skin injuries. So, in 2005 the patent of USA was issued on the "Stable hydrogen peroxide compositions, products and methods of use" (US 6964782 B1. Nov. 15, 2005). The essence of the invented drug is that it is a solution that contains 0.1-15% hydrogen peroxide, about 1% surfactant, 0.05-1% stabilizer and local analgesic that is packed in a container. This solution is applied to the skin as a stable peroxide foam. The product is intended for the treatment of minor skin damage.

The correctness of our choice was further confirmedby the fact that solutions of hydrogen peroxide are widely used for washing purulent wounds in various purulent diseases, and the solution itself belongs to over-the-counter medications and is considered safe for people.[20-22]

However, the known solutions of hydrogen peroxide were not considered from the position of having certain and "necessary" physical and chemical properties, which can be of crucial importance for local action on the skin. In particular, the physical and chemical properties of the finished pharmaceutical product with hydrogen peroxide were not considered as the basis for the physical and chemical inactivation of local irritating agents contained in the prickles of burning plants, in particular, nettles. In addition, the local mechanism of action of hydrogen peroxide was not associated with the drug form as a finished pharmaceutical product with special quality indicators that can affect the local pharmacodynamics and pharmacokinetics of hydrogen peroxide. The fact is that the solution of hydrogen peroxide (as a solution of any other biologically active substance) has certain physical and chemical properties, and the foam obtained from this solution has other physical and chemical properties. In particular, the above-mentioned peroxide foam reduces the pharmacological activity of the solution from which it is formed.

Due to the fact that the task of our research was to develop an antiseptic that has the activity of a local antidote and a drug suitable for emergency treatment of nettle burns, the known solutions of hydrogen peroxide and previously invented peroxide foam did not meet the objectives.

Then the analysis of dosage forms and finished pharmaceutical products intended for local application to the skin and mucous membranes was carried out. The following inventions were studied and analyzed.

In 2010, a Russian patent was issued for the invention the «Pharmaceutical composition based on acridonacetic acid and its compounds for treatment of suppurative-destructive lesions of mucous membrane and skin, general system diseases in case of immunodeficiency states» (RU 2404773 C1. Nov. 27, 2010). This pharmaceutical composition contains acridonacetic acid or its therapeutically active compound, target additive and base, at the same time it contains at least one substance selected from the following row as additional target additive: immunomodulator, substance having antibacterial activity in respect of gram-positive and/or gramnegative bacteria, antimycotic agent, anesthetic agent, biogenic element, vitamin, preservative or their mixture at a certain ratio of components. Composition is arranged in the form of suppositories or capsules for rectal and vaginal use or in the form of soft dosage form: ointment, cream, gel or in the form of fluid dosage form for topical and local administration.

But, this product is not intended for children and pregnant women, as it contains a lot of biologically active ingredients that are highly resistant and long-lasting on the skin. Therefore, this tool can cause an allergic reaction in children and have an undesirable effect on the fetus in a pregnant woman.

In 2018, a cosmetic composition was invented against itching and redness of the skin caused by insect bites, which is a mixture based on sea buckthorn oil with essential oils of fir, thyme, cedar and snakehead (RU 2646789 C1. Mar. 11, 2018). The disadvantage of this tool is that it is a vegetable oil, so it has a hydrophobic property, stays on the skin for a long time after use, stains the skin and clothes of children, leaves behind greasy spots that are poorly washed off. All this worsens the aesthetic result of treatment. To this we must add that it does not eliminate itching and pain in the skin when burned by burning plants, in particular, nettle, since it does not contain a local anesthetic and a local antidote. In addition, this tool does not have a rapid and pronounced antiseptic effect, so it does not protect the body from the penetration of viruses, including the COVID-19 coronavirus.

In 2018, a Russian patent was issued for the invention the "Pharmaceutical combined composition for local and external use on basis of bacteriolytic and proteolytic complex of enzymes" (RU 2655808 C2. May, 29, 2018). The basis of this composition are 0.01-5.0 % Lysoamidase, 0.5–6.5% anesthetic and 0.1-5.0% Dioxidine. Additionally, they may include 0.01-2.5% Ofloxacin or Ciprofloxacin, 0.2–5.0%

Netilmycin or Amikacin, 0.1–2.0% Sodium lauryl sulfate and Trimethoprimoramix. Inventions provides an increase in antibacterial and/or antifungal activity.

However, this product is not intended for children and pregnant women, as it contains a lot of biologically active ingredients that are highly resistant and long-lasting on the skin. Therefore, this tool can cause an allergic reaction in children and have an undesirable effect on the fetus in a pregnant woman. In addition, this composition does not contain a local antidote for inactivating histamine and formic acid, so it does not eliminate the nettle burn. The agent inhibits the vital activity of bacteria and fungi, but not viruses.

In 2019, a Russian patent was issued for the invention the "Hydrogel composition for treating burns" (RU 2703307 C1. Oct. 16, 2019). This invention contains 1.0–10.0% lidocaine hydrochloride, 1.0–10.0% 2-allyloxyethanol, 0.2–1.2% Rheocare C Plus and 0.2–1.0% Cosmedia SP as viscosity modifiers, 0.1–0.5 % EumulginPrisma as an emulsifier, 5.0–15.0% Cetiol 4 All as an emollient, 1.0–3.0 % Lanette D as a consistency regulator, 0.5–1.5% LekoGuard MPP 20 as a preserving agent, 25% solution of NaOH as a pH regulator in an amount to pH 5–6 and water (rest).This hydrogel composition has an antimicrobial, analgesic effect and promotes healing of burns of various etiologies.

But, this product is not intended for children and pregnant women, as it contains a lot of biologically active ingredients that are highly resistant and long-lasting on the skin. Therefore, this tool can cause an allergic reaction in children and have an undesirable effect on the fetus in a pregnant woman. In addition, this composition does not contain a local antidote for inactivating histamine and formic acid, so it does not eliminate the nettle burn. Moreover, this composition has a pH of 5-6, that is, it is acidic, so it increases the local irritating effect of formic acid, which is injected into the skin by spines of nettle leaves. The agent inhibits the vital activity of bacteria and fungi, but not viruses.

In 2019 a Russian patent was issued for the invention «Dental gel with a phytopeloid composition» (RU 2699560 C1. Apr. 9, 2019). The proposed dental gel contains dry extracts of vegetable raw materials with the following ratio of components (wt%): Salix caprea dry bark extracts 1,0-2,0; dry extract of Licorice roots 1,0–2,0; water solution extract of sulfide-silt iodine-bromine mud 2,0-3,0; Essential oil of medicinal sage 0,05-0,1; Chlorhexidinebigluconate 1,0-2,0; Lidocaine hydrochloride 1,0-2,0; Ascorbic acid 2.0-3.0; Carbopol 3.0-5.0; Sorbitol 2,0-4,0; Nipagin 0,2-0,5; Purified water-balance. This gel has an anti-inflammatory, immunomodulatory and regenerating effect.

However, this means does not meet our goals, because it contains extracts of plants that can play the role of allergens and cause an allergic reaction in children, and is acidic, so it is not able to inactivate formic acid, which is contained in the spines of nettle.

In parallel, we analyzed the known dosage forms used for the production of drugs for application to the skin and mucous membranes. The selection criteria were high hydrophilicity, preservation of the biological activity of hydrogen peroxide during storage and application, potentially high physical and chemical reactivity and the value of the range of values of alkalinity, osmotic activity, oxidative activity, local temperature, the presence of high wetting ability, high penetration into the skin of people and plants, colorlessness, transparency, the possibility of easy acquisition of washing, cleaning and bleaching activity, as well as rapid self-inactivation of unused ("excess") active ingredients after applying the finished product to the skin.

The results of the analysis allowed us to determine that only the water gel meets all these criteria. Other inventors make the same choice. Not by chance, it is in the form of an aqueous gel that a lot of new drugs have been proposed, invented for the treatment of various skin diseases:"Moisturizing skin gel and method" (US 20030198616 A1. Oct. 23, 2003), «Composition for treating acne mainly" (CN 1883645 A. Dec. 27, 2006), "Mineral salt gel compositions" (WO 2006112690 A1. Oct. 26, 2006), "Gel face pack prepared from bacteroidal cellulose" (CN 1872022 A. Dec. 06, 2006), "Adapalene gel composition and its preparation" (CN 1989956 B, Sept. 01, 2010), "Topical gel composition" (WO 2012052478 A2, Apr. 26, 2012), "Gentle-acting skin-disinfectants and hydroalcoholic gel formulations" (US 8293802 B2, Oct. 23, 2012),"Anti-burn gel" (RU 2481121 C2. May. 10.2013), "Disinfectant antiseptic agent in gel form for care of hand skin" (RU 2523560 C1. Jul. 20, 2014), "Facial skin care gel (versions)" (RU 2568890 C1. Nov. 20, 2015) and "Doxorubicin and organosilicon nanoparticles-niosomes-based pharmaceutical gel for skin cancer treating" (RU 2600164 C2, Oct. 20, 2016).

We analyzed the composition of all the discovered gels, which were invented for the immediate treatment of minor injuries in skin and mucous membrane.It turned out that most of the new gels contain, in addition to water, a formative substance, that is necessary to increase the viscosity of the colloid medium, an antiseptic or chemotherapeutic agent, that is necessary to fight infectious agents, a corticosteroid or other anti-inflammatory agent, a local analgesic or local anesthetic, that is necessary to decrease the inflammation, cationic surfactants and extracts of medicinal plants. Moreover, hydrogen peroxide is the leader among the antiseptics that are part of most new skin gels. But there is no precise indication of the

concentration of this antiseptic and no indication of the osmotic, acid (alkaline) and temperature activity of its solution. On the other hand, it is hydrogen peroxide that is the safest antiseptic, which is proved by a large range of concentrations that are safe and allowed for medical use for external use (up to 20%). Of the old antiseptics, only ethyl alcohol can be prescribed in a higher concentration (up to 96%) than hydrogen peroxide. But ethyl alcohol has a high resistance to storage (it has an indefinite shelf life), has a stronger local irritating effect and encourages alcoholics to take it "inside", not external use. Therefore, ethyl alcohol does not meet our requirements. In addition, ethyl alcohol does not have oxidative activity and does not dissolve human skin and plant skin. That is why ethyl alcohol used in pharmacy as a preservative.

In addition, hydrogen peroxide rapidly decomposes under the action of the catalase enzyme to water and oxygen gas. Hydrogen peroxide solution has long been used in various fields of medicine in the fight against infections and purulent diseases. At the same time, hydrogen peroxide has an impeccable recommendation and very high safety for all categories of patients. In this regard, we chose hydrogen peroxide from the old antiseptics.

After that, it was decided to determine the "necessary" range of concentrations of hydrogen peroxide and then artificially modernize the physical and chemical properties of the finished pharmaceutical product (gel), which will give it an antidote activity. In our opinion, the expected pharmacological activity of a solution of hydrogen peroxide in an aqueous gel with its local application was not previously disclosed precisely because of ignoring the leading role of physical and chemical properties.

When upgrading the hydrogen peroxide solution, we proceeded from the need to determine the "correct" values of the following physical and chemical properties: the concentration of hydrogen peroxide, osmotic activity and acidity of the gel.The required pH level was set first. This turned out to be quite simple, since all known gels were acidic and had a pH of less than 7.0. At the same time, we were convinced that in order to inactivate formic acid and eliminate skin burns with nettle, the gel must be alkaline, that is, have a pH greater than 7.0. It has been shown that alkaline means are also used in dermatology. In particular, to neutralize the increased acidity of the skin of patients, it is recommended to externally apply alkaline solutions with a pH value of up to 11.5.[18]

In order to clarify the "desired" value of the alkalinity of the hydrogen peroxide solution, we analyzed scientific articles on the corresponding antiseptics and cationic surfactants, as well as on the dynamics of their activity when the local temperature changes. It turned out that the biological activity of cationic surfactants increases when the temperature rises above 30 °C and when the acidic medium changes to a neutral medium and even above pH 7.0.[19]Consequently, the alkaline activity of the gel will increase the activity of cationic surfactants.But this does not mean that the gel can have a very high alkalinity, since an excessively high alkalinity of the gel can cause an alkaline skin burn in young children.In this regard, an analysis was conducted of all known alkalis and safe. The results of the analysis showed that the safest of them is sodium hydrogen carbonate. Moreover, sodium hydrogen carbonate has not only an alkaline, but also a buffer activity. Therefore, it is better than all alkalis not only for its high safety, but also for its buffer activity, since it provides a stable alkalinity of solutions in pH 8.4 – 8.5 almost regardless of the value of its concentration.[20]

The above data allowed us to choose another "necessary" ingredient of the future gel, namely, a cationic surfactant. The fact is that the presence of a cationic surfactant in the gel contributes to the gel's washing and cleaning activity, which increases in conditions of local hyperthermia and moderate alkalinity of the gel. In turn, local hyperthermia and moderate alkalinity will ensure high efficiency of skin sanitation at the site of its nettle burn.

Then we analyzed the composition and pharmacological activity of new antiseptics containing hydrogen peroxide and sodium hydrogen carbonate and intended for the treatment of skin wounds. The "new" medicine turned out to be "Bleaching opener of dried blood for wrapping bands adhered to a wound" (RU 2653465. May. 08, 2018). This medication is an aqueous solution 0.75-1% hydrogen peroxide, 1.2% sodium hydrogen carbonate and 0.5% lidocaine hydrochloride. It has a high antiseptic activity, is highly safe, but it does not provide effective protection of the skin from nettle burn, as it does not have a washing and cleaning activity due to the fact that it does not contain a cationic surfactant. In addition, the agent is not a gel, so it is devoid of adhering activity. Positive is the presence in the gel of a local anesthetic that easily penetrates through the skin, namely, lidocaine hydrochloride, since this agent gives the drug the necessary anesthetic activity. But the local anesthetic is contained in a low concentration, so the drug does not have an urgent and strong analgesic effect. To this should be added another drawback: the known remedy does not provide local hyperthermia, so it does not provide the highest possible pharmacological activity.

After that, we developed a new medicine from old medicines, namely "Gel for children's skin"(RU 2713943 C1. Feb. 11, 2020). The invention consists in the fact that the agent at a temperature of +45 °C and a pH of 8.0-8.5 consists of water, 0.75-1 % hydrogen peroxide, 2% lidocaine hydrochloride and cationic surfactants in an amount that provides a gel-like consistency at a temperature of +24 - +26 °C.

The fact is that in conditions of room temperature, this product is a viscous gel, and when heated to +45 °C (that is, at the time of application to the selected skin area), this product is liquefied and acquires the maximum "necessary" pharmacological activity: it retains adhesive, alkaline, isotonic, penetrating, antidote and foaming activity. It is shown that when applied to the skin in conditions of local hyperthermia, the invented drug quickly moistens, impregnates, steams, softens and loosens the epidermis. In this case, the claimed gel causes alkaline saponification and many oxygen "micro-explosions" due to cold boiling due to the conversion of hydrogen peroxide under the action of the catalase enzyme into oxygen and water. These numerous microbursts successfully destroy protein and protein-lipid complexes that make up such biomaterials of the skin's surface layer as epidermis cells, sweat, pus, living and dead blood cells, and microorganisms, including viruses.

As a result, the gel provides the release of prickles from the epidermis from burning plants, as it reduces the friction force between the venomous hairs and prickles that have sunk into the skin, on the one hand, and the skin itself that surrounds them from the outside and squeezes them, on the other hand. Subsequent wiping of the skin with a sanitary napkin helps to easily remove the prickles outwards along with the epidermis.

The fact is that the claimed product contains 0.75-1% hydrogen peroxide, which at a pH of 8.0 – 8.5 and a temperature of +45 °C provides high speed and efficiency of loosening of thick and dry biological tissues, including such tissues as sweat, pus and blood, due to saponifying, destroying, flotation and suspension action. Alkaline properties are provided not only by cation-active surfactants, but also by sodium hydrogen carbonate, which is the most optimal alkaline buffer for the selected pH range.[23] Thanks to this, the alkalis provide chemical saponification of the biological mass at the boundary of media separation and safe diffusion penetration of the liquid gel into the skin without damaging it. The presence of hydrogen peroxide provides a release of interstitial molecular oxygen, the formation of gas bubbles in the bulk liquefied biological mass, which is loosened from it, and then the gas bubbles glued to his liquefied and crushed particles of blood, pus, group cemented epidermal cells and tear them due to the adhesion of the layer of live skin. At the same time, local hyperthermia and alkalinity increase the antiseptic activity of hydrogen peroxide, so the invented gel quickly destroys the pathogen of all infections, including viruses, including the new coronavirus.

In addition, the claimed product due to the presence of 2% lidocaine hydrochloride in its composition provides the gel high safety for the cells of our body, since the gel has an isoosmotic activity within 280 mosmol/l of water. In other words, the claimed drug is isotonic. Due to this, the drug has a high penetrating power, easily permeates the skin and quickly causes effective local anesthesia in it, quickly deprives the skin of all types of sensitivity. The local anesthesia, in turn, provides not only a local analgesic effect, but also a local antihistamine effect, since it is accompanied by inhibition of histamine receptors.

To protect the skin from being burned by plants, a warm gel is applied to the skin in a thin layer, after which it can immediately be covered with a layer of waxed paper or plastic film, and a hot water bottle can be placed on top of this layer. In this case, the skin is disinfected, deodorized, steamed, macerated and cleansed of dirt and "dirty" epidermis. It is shown that after 5 to 10 seconds, the epidermis in the skin treated with gel and warmed with a compress, swells, softens, loosens and discolors, so the skin becomes light in color. After 20-30 seconds after this, the action is stopped, and the skin surface is carefully wiped with a sanitary napkin so that the gel remains are reliably removed along with the decontaminated, softened and loosened epidermis and spines.

CONCLUSION

Thus, the most common and safety substances: water, hydrogen peroxide, lidocaine hydrochloride and cationic surfactant, in certain concentrations, but with new physical and chemical properties (at a pH of 8.4-8.5, at a temperature of + 45 °C and with an osmotic activity of 280 mosmol/l of water), surprisingly allowed to create an unusual children's gel for theurgently remove the nettle burn.

Conflict of Interest: None

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