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QUALIFICATION WORK

on the topic: « **DEVELOPMENT OF THE COMPOSITION AND TECHNOLOGY OF EXTEMPORANEOUS GEL FOR THE TREATMENT OF LICHEN PLANUS »**

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ANNOTATION

As a result of the research, the composition and technology of the extemporaneous ointment for the treatment of ringworm were substantiated. The stability and technological properties of the ointment for local use were studied.

The organoleptic and physico-chemical indicators of model samples of the ointment were determined in accordance with the methods of the pharmacopeia. According to the results of the conducted research, the stability of the developed ointment was established.

The work is laid out on 53 pages, includes 11 tables, 6 figures, and 45 literature sources.

Key words : ringworm, symptomatic therapy, technology, composition, extemporaneous ointment.

АНОТАЦІЯ

У даній кваліфікаційній роботі представлено результати експериментальних досліджень, щодо розробки складу та технології гелю для лікування бактеріальних інфекцій шкіри. В роботі проведено аналіз літератури щодо причин розвитку, патогенезу та терапії бактеріальних інфекцій шкіри; проаналізовано асортимент лікарських засобів з метою аналізу діючих речовин для лікування бактеріальних інфекцій шкіри та обгрунтовано вибір компонентів гелевої основи. На основі літературних даних та експериментальних досліджень встановлено оптимальний склад гелю. Проведено експериментальні дослідження щодо вивчення стабільності основи.

Ключові слова: бактеріальна інфекція, гелева основа, декаметоксин, ефірна олія чайного дерева, стабільність, технологія.

CONTENT

INTRODUCTION

Actuality of theme. In recent years, the assessment of the quality of life has become a subject of clinical interest, scientific research, a criterion for prescribing or correcting the use of medicinal products. As we know, diseases affect both the physical condition of a person and the psychology of his behavior, emotional reactions, often change his place and role in social life.

Therefore, it is important to get the most complete picture of the nature of the impact of the disease on the most important functions of a person, which allows to make a method of assessing the quality of life. Data on the quality of life make it possible to constantly monitor the patient's condition and, if necessary, correct the therapy. Assessment of the quality of life made by the patient himself is a valuable and reliable indicator of his general condition. Indicators of the quality of life, along with a traditional medical opinion made by a doctor, make it possible to draw up a complete and objective picture of the disease (A. Novikov, 2012; A. A. Kubanova, 2014; N. G. Kochergin, 2016). In this regard, the study of the quality of life of lichen patients is quite relevant.

Ringworm is a group of skin diseases with similar symptoms but different causes. Most often, the disease occurs as a result of a fungal infection, less often - a viral one. Depending on the causative agent , seven types of lichen are distinguished , which have their own characteristics in terms of the localization of the foci and the severity of the course.

Children and elderly people with weakened immunity are more prone to skin diseases.

Ringworm is caused by microscopic fungi, which are distinguished by their habitat: on the skin of animals; on human skin and in the ground.

Also, the cause of ringworm can be the herpes virus, which lives peacefully and calmly on the skin of humans and animals for a long time. But as soon as a favorable situation arises in the human body, the virus begins to multiply intensively and provoke a pathological process.

Despite many studies, the etiology and pathogenesis are not sufficiently understood, although viruses and changes in the immune response are considered to be important factors in the development of the disease. It has been established that this disease is the result of a complex interaction of defects in the barrier function of the skin, immune changes and infectious agents.

The purpose of the study . Conducting theoretical and experimental studies on the improvement and development of the composition and technology of extemporaneous ointment for the symptomatic therapy of lichen planus.

Research tasks :

– analyze modern approaches to the treatment of lichen planus;

– to analyze the modern assortment of ready-made and extemporaneous medicinal forms for the treatment of various types of ringworm;

– theoretically and experimentally substantiate the development of the composition of the ointment, taking into account the physical and chemical properties of the substances included in its composition;

– to study the stability of the developed ointment during storage.

The subject of research . Experimental studies on the development of the composition and technology of extemporaneous ointment for the treatment of ringworm.

Research objects . Solcoseryl, ascorbic acid, pumpkin oil, birch tar, ointment bases.

Research methods . Modern pharmaco-technological and physico-chemical research methods .

Practical significance of the obtained results . The composition and technology of extemporaneous ointment for the symptomatic treatment of ringworm were substantiated.

Structure and scope of qualification work. The qualification work consists of an introduction, a literature review (Chapter 1), an experimental part (Chapters 2 and 3), general conclusions, a list of used literary sources, and

appendices. The work is laid out on 53 pages, includes 8 tables, 12 figures, 45 literature sources.

SECTION 1

LICHEY – ETIOPATHOGENETIC MECHANISMS AND MODERN WAYS TO SOLVE THIS PROBLEM

1.1. Dermatological diseases classification and description

Nowadays, there are many skin diseases of various etiologies. It is always unpleasant and each case requires separate attention, including research and treatment. Identifying the cause of the disease helps us act not symptomatically, but specifically on the factor that caused the disease. Knowledge of the etiology and pathology of the disease is what constitutes the basis of the effective and fastest recovery of a person. In order to cure such a disease as lichen, we need to find out why this disease appears and what causes its appearance [23].

The skin is an incredible organ. Our first line of defense against disease, this organ protects everyone else, warms and cools us, and sends messages about how healthy we are inside. From the first descriptions of skin diseases in Egyptian papyri and the writings of Hippocrates to the first treatises on dermatology, important figures and discoveries have marked this specialty. In the 18th and 19th centuries, this specialty became established as a branch of medical research based on the first classifications of dermatoses, diagnostic methods, and drug treatment. In the 20th century, the scientific and technological revolution changed the practice of dermatology, incorporating new therapeutic resources as well as surgical and aesthetic procedures.

Dermatology has undergone an intensive process of historical formation and transformation, following the evolution of modern medicine and pharmacy, and continues to develop today. After all, modern methods and their development help us to engage in timely prevention, research and treatment of the disease.

Dermatologists are expert physicians and skin surgeons with unique skills and experience who work to offer the best care for the organ that cares for us. The condition of our skin can seriously affect our health and well-being. Sometimes the

condition of the skin is a sign of a serious health problem, and it is the dermatologist who can be the first to notice it. A skin condition can cause sleep loss, low self-esteem, severe depression, or loss of productivity.

As the largest organ of the body, our skin plays a vital role in protecting our body from germs and foreign elements. It maintains a comfortable body temperature, and the nerves under the skin provide a sense of touch. The skin has three layers:

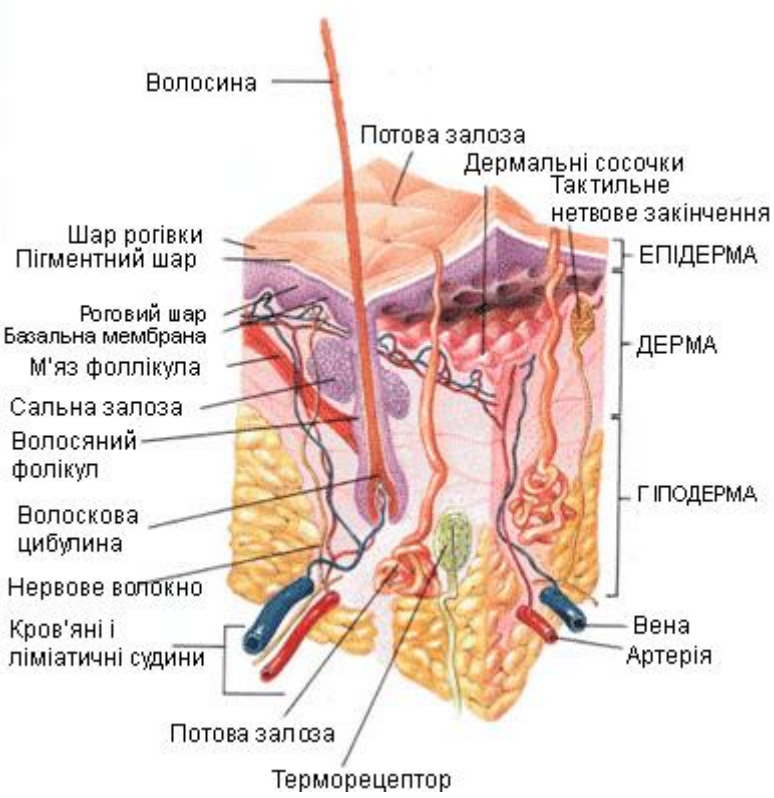

Fig. 1.1 Skin structure.

Epidermis, the upper layer. The epidermis is the top layer of skin that we can see and touch. Keratin, a protein inside skin cells, makes up skin cells and sticks together with other proteins to form this layer. It acts as a protective barrier, creates new skin, protects our body from germs and bacteria and provides skin color.

Dermis, middle layer. The dermis makes up 90% of the skin's thickness. This middle layer of the skin contains: collagen and elastin, and the roots of the hair follicles are attached to the dermis. Nerves in the dermis tell us when something is too hot to touch or too soft. These nerve receptors also help us feel pain. Sebaceous glands in the dermis help keep the skin soft and smooth. Sweat glands in the dermis secrete sweat through skin pores , which in turn helps regulate body temperature.

Hypodermis, the lower or fat layer. This is the fat layer of our skin. Softens muscles and bones: The fat in the hypodermis protects muscles and bones from injury during a fall or accident. Has connective tissue: this tissue connects layers of skin to muscles and bones. Helps nerves and blood vessels. Regulates body temperature: fat in the hypodermis protects us from excessive cold or heat.

Skin diseases are conditions that affect our skin. These diseases can cause rashes, inflammation, itching or other unpleasant skin changes. Diseases vary widely in symptoms and severity. They can be temporary or permanent, can be painless or painful, minor or life-threatening. Some have situational causes, while others may be genetic.

Certain lifestyle factors can lead to the development of skin disease. Some of the common causes of skin diseases can be:

- bacteria that got into the pores or hair follicles;
- conditions that affect the thyroid, kidneys, or immune system;
- contact with environmental factors, such as allergens or another person's skin;
- genetics ;
- certain groups of medicines.

Symptoms of skin conditions vary greatly depending on which condition you have. Skin changes are not always caused by the disease itself. For example, you may get a blister from wearing the wrong shoes. However, when skin changes occur without a known cause, they may be related to a disease. As a rule, skin diseases can cause:

- Discolored areas of the skin (abnormal pigmentation);
- Dry skin;
- Open wounds;
- Lesions or ulcers;
- Peeling of the skin;
- A rash, possibly with itching or pain;

- Red, white or pus-filled bumps;
- Scaly or rough skin;

There are many skin diseases caused by various factors, which differ in etiology, symptoms, prevention and treatment. Most often, dermatologists are consulted with the following skin diseases [4, 6, 18, 35] :

1. Acne is the most common skin disease, usually a problem for every teenager. In addition, the number of cases is increasing among adults. Pimples can be caused by blockage of hair follicles and sebaceous glands of the skin, most often the reason for the appearance of these rashes is hormonal changes. The term "acne" refers not only to pimples on the face, but also to blackheads, cysts and nodules. In some people, acne appears on other parts of the body, for example, on the back and chest.

2. Atopic dermatitis. It is one of the most common forms of eczema in children. The exact cause of atopic dermatitis is unknown, but researchers believe that the disease may be related to genetics, the environment, and/or the immune system. Atopic dermatitis can appear on the face (especially in infants), hands, feet, or in skin folds. Dry, scaly and itchy skin is normal, and constant brushing can cause the area to thicken.

Fig. 1.2. Atopic dermatitis.

3. Shingles. The shingles virus causes a red, vesicular rash that can cover the trunk or appear anywhere on the body. The appearance of the rash may be accompanied by fever, fatigue and headache. Shingles is caused by the same virus that causes chickenpox, the varicella zoster virus. If you have had chickenpox, you are at risk of developing shingles because the chickenpox virus lies dormant (inactive) in your nervous system for years.

Fig. 1.3. Shingles.

4. Hives are common wounds that can appear on the skin. Common causes of hives are medication, food, and insect bites. If urticaria covers a large area of the body, there is swelling of the throat or face, which interferes with normal breathing, you should immediately seek medical help. Hives usually disappear after 2-4 hours, but some people may have hives for months or years, which is called "chronic urticaria".

Fig. 1.4. Urticaria.

5. Sunburn. There is no doubt - it is easier to prevent a sunburn than to treat it. Sunburns occur when the skin absorbs too much ultraviolet light from the sun's rays. The skin becomes red, painful, hot to the touch and may even peel off. Repeated sunburns, especially during childhood, can increase the risk of skin cancer later in life.

6. Contact dermatitis. Most of us have encountered this disease - when we touch something to which our skin gives a reaction. Contact dermatitis is a type of eczema and can be caused by plants (poison ivy, sumac, oak), jewelry, latex gloves, and irritants such as bleach or soap. To prevent contact dermatitis, avoid the irritant whenever possible.

Fig. 1.5. Contact dermatitis.

7. Diaper dermatitis. Anyone who has a baby knows about the common problem of diaper rash. A wet or soiled diaper left on for too long can cause a rash on the buttocks, genitals, and skin folds. Urine and stool can break down the skin, and chemicals in disposable diapers can dissolve and irritate the skin. Candida (yeast) or bacteria can also take advantage of inflamed, damaged skin and complicate the rash.

8. Rosacea is a chronic swelling of the face with redness, protruding blood vessels and pimples. Rosacea is most common in women over the age of 30, but men

can also get it. This condition can be caused by immune system problems, vein problems, and/or environmental problems.

Fig. 1.6. Rosacea

9. Mycosis of the foot. Our feet are prone to fungal infections. These infections can cause severe itching, redness, and cracking of the skin on the feet and between the toes. A type of fungus called dermatophytes is commonly found in warm, moist areas such as pool decks, showers and locker rooms.

Fig. 1.7. Mycosis of the feet

10. Basal cell cancer. Basal cell carcinoma is the most common type of skin cancer. BCC develops in the upper basal cells of the skin, but rarely spreads and is cured. You may be prone to BCC if you spend a lot of time in the sun or use a tanning bed frequently. Growths usually appear on the head, ears, nose and neck. They may appear shiny, red and scaly, or resemble an open wound [34].

These are the most common skin diseases with which people turn to specialists, hoping for a high-quality examination, quick treatment and pharmaceutical care. It is not always possible to suspect this or that disease in time, but precisely for this reason, one should treat one's condition more meticulously and attentively. Observing a change in skin color, the appearance of new rashes, and seeing a doctor on time is the greatest gift you can give to your health.

1.2. Herpes - etiopathogenetic mechanisms and modern ways of solving the specified problem .

It should be noted that ringworm is the general name of a whole group of dermatological diseases, which are accompanied by the formation of rashes of various nature on the skin. Some pathologies appear in the form of a spot, some in the form of a small nodular rash, and others can look like scaly plaques, while they can be of different colors and sizes [2].

Different types of lichen are combined into one group of diseases due to external similarities: they all occur on the skin (sometimes on the mucous membranes), mostly have an inflammatory nature of origin and are located on different parts of the body. Most often, the pathology affects the back, face and chest, because in these areas there is the largest number of sweat glands.

The clinic of the disease depends on its form. There are many types of this disease, but five of the most common are distinguished: red flat, pink, shearing, belting, bran-like. In order to understand the reasons for the appearance of any of the types on the skin and to start treatment, it is necessary to analyze each of them in more detail [12] .

Red flat. This type of lichen is characterized by the formation of scaly elements of bright red or dark brown color on the skin and mucous membranes. The pathology is accompanied by specific depressions in the middle of each spot and severe itching, which significantly interferes with normal life, causing severe discomfort. In most cases, the elements are localized in natural folds, as well as on

the stomach and back. After recovery, pigment spots may persist for a long time in the area of former rashes.

Fig. 1.1 Red lichen planus

Lichen planus is thought to be caused by an autoimmune response mediated by T cells and targeting basal epithelial keratinocytes in genetically predisposed individuals. Taking drugs such as beta-blockers, nonsteroidal anti-inflammatory drugs, angiotensin-converting enzyme inhibitors, sulfonylurea drugs, gold, antimalarial drugs, penicillamine, and thiazide diuretics can provoke the development of this type of lichen [23] .

At the beginning of the disease, rashes can reach a diameter of 2 to 4 mm, have clumsy outlines and a distinct shine in mixed light. Usually, this rash is located symmetrically, more often on the flexor surfaces of the wrists, legs, trunk, head of the penis, as well as the mucous membranes of the oral cavity and genitals. The skin of the face is affected much less often. The onset of the disease can be both sudden and gradual.

There is a so-called Kebner's phenomenon, the essence of which is that during an exacerbation, new rashes may appear in places of minimal skin trauma, for example, with a superficial scratch. In many cases, rashes regress without treatment, due to the termination of the action of the provoking factor. Relapses occurring after

years of remission may be due to repeated exposure to trigger factors or a change in the mechanism of disease provocation [25].

Diagnosis of lichen planus. Usually, diagnosis of lichen planus includes: blood test (general and biochemical); hormonal profile; histological and cytomorphological examination (affected tissues are prone to hyperkeratosis, degeneration of the epidermis, presence of infiltrate, etc.); skin biopsy; consultation of a dentist and other related specialists (endocrinologist, gastroenterologist).

Pink lichen. This type is characterized by the appearance of one pink plaque on the skin, this plaque does not exceed 3-4 cm. The formation is prone to peeling, causes moderate itching. A week after the appearance of the first plaque on the body, multiple subsidiary rashes are formed, localized mainly on the folds and folds of the back and abdomen [11] .

Fig. 1.2 Leave Zhiber

This type of lichen can affect people with weak immunity or children. Usually, Zhiber's lichen rosacea occurs after a cold. Typical time of appearance: autumn, spring. It can occur in both women and men. The cause can also be a viral infection (in some studies, the role of human herpes virus types 6, 7 and 8 has been shown) [10] .

Symptoms. After a cold or stress or hypothermia, symptoms of lichen planus can be observed - a rash. But before that, there may be headache and joint pain, a slight increase in temperature.

The main symptom of lichen planus is a pink spot that is approximately 3-5 cm or larger in size. It can be called a maternal plaque - in the first days - a single

spot. Later (after 7-10 days), similar small spots of pink color, 0.5-2 cm in size, spread over the skin. After a few days, the center of the spot lightens, and the stratum corneum shrinks and gradually cracks, forming scales. At the same time, the central part of the focus is free of scales and looks like a slightly swollen roller [5] .

Usually, lichen planus appears on the skin for two to three weeks, during which there may be about 10 outbreaks of new rashes that pass later (after 7-8 weeks). Where there were former foci, pigmentation is slightly noticeable - it passes after some time.

There are also atypical manifestations of pink lichen, which are not accompanied by characteristic symptoms. For example, there may not be a birthmark, but there is the presence of small pink spots on the surface of the skin. It is rare, but there is also a long course of the disease - from two to six months [45] .

Diagnosis of pink lichen. Clinical assessment. The diagnosis of this disease is established on the basis of the data of the clinical picture and localization of rashes.

Differential diagnosis includes: mycosis of smooth skin, lichen planus, toxidermia, psoriasis, parapsoriasis, chronic lichenoid parapsoriasis, lichen planus, secondary syphilis.

Conducting serological tests for syphilis is indicated when the skin of the hands and feet is affected, when there is no maternal plaque or when rashes appear in an unusual sequence or in atypical localization.

Ringworm. It is considered the most common form of focal disease. Pathology develops on the skin, nails, scalp and even on the hair itself. It is accompanied by the formation of round red spots that constantly peel off and cause intense itching [3] .

Fig. 1.3. Leave Zhiber

Damage to the skin on the head leads to partial baldness: a focus forms around the lichen, where the hair breaks off at the level of 0.5-1 cm from the dermis. In some cases, in addition to the main focus, multiple but small areas of additional damage may occur [4] .

The main causes of this fungal disease are: direct contact with a sick person; use of household items used by the patient (for example, a comb, headdress, gloves); contact with sick animals (kittens, rodents, calves).

There are also a number of adverse factors that contribute to the development of ringworm: microtraumas and skin scratches; increased humidity in the room; febrile condition; reduced immunity; endocrine disorders; hypovitaminosis; non-compliance with the rules of personal hygiene.

Symptoms. Clinical manifestations depend on the location of the fungal infection and the type of pathogen:

Superficial trichophytosis of smooth skin: on open areas of the skin there are pathological cells with clear contours, round or oval in shape, pale pink in color, with peeling in the center. The foci can merge. A sick person is worried about mild itching in the affected area.

Superficial trichophytosis of the scalp: the hair in the lesion is broken at a height of several mm from the skin level. The pathological cells themselves can be of different sizes, rounded or irregular in shape, without a clear contour [18] .

Chronic trichophytosis: mostly teenage girls suffer from this form of the disease. It develops due to the lack of treatment of the acute process. The main symptom is the presence of so-called black dots, which occur due to short hair broken at the level of the skin. The lesions themselves have a bluish tint, with slight peeling.

Diagnosis of ringworm. It is not difficult for a doctor to suspect ringworm, since the disease has a specific clinical picture. But in order to make a diagnosis, the doctor, in addition to conducting a thorough examination of the patient, needs the results of additional research methods, such as: microscopic examination of the affected skin area and clinical and biochemical blood analysis [27].

Shingles. This type of pathology mainly occurs in people who have previously suffered from chicken pox. Initially, even before the appearance of rash elements, a person has symptoms similar to SARS (subfebrile body temperature, weakness, chills, increased drowsiness), and after a few days, multiple rashes form on the skin in the area of large nerve trunks and branches. Inside each bubble is a clear liquid. Gradually, the rashes dry up, darken, become covered with crusts, then fall off.

Fig. 1.4. Shingles.

Symptoms. A shooting or other type of pain develops in the affected area, which is usually followed after 2-3 days by a rash, the usual accumulation of bubbles. The usual sites are one or more adjacent dermatoses in the chest or lumbar area, although several concomitant foci may appear. The lesions are unilateral and do not cross the midline of the body. The site is usually sensitive and the pain can be severe. Lesions usually continue to form for 3-5 days [33] .

Shingles can be spread by touching the blisters of an infected person. Also, this species can spread through contact with droplets of liquid from the nose and throat of an infected person. Droplets containing the virus enter the air when an infected person coughs or sneezes. They are easy to inhale and get infected.

Diagnostics. Clinical assessment. An examination of the patient by a dermatologist is usually enough to establish the correct diagnosis. In some cases, when the clinical picture is smeared, the doctor can prescribe a blood test for antibodies, PCR diagnostics and other studies.

Briniform lichen. This is a dermatological disease caused by a fungus of the genus Malassezia. These microorganisms are representatives of the typical microflora of each, are found in most people and do not cause the development of the disease. However, under the influence of external or internal factors, the pathogen can transform from a non-pathogenic form into a pathogenic one: the fungus enters the upper layers of the skin and damages melanocytes - cellular structures responsible for the pigmentation of any skin [14].

Symptoms. The first symptom of lichen planus is the appearance of small spots localized on the body, hands, scalp or external genitalia. The rash may be accompanied by slight itching or may not cause any noticeable discomfort to the patient.

Fig. 1.5. Briniform lichen

At the initial stage of seborrheic dermatitis, the rash does not have a sharp outline, it is not inflamed and swollen. At first, they differ in pink color, but

gradually change their shade: from pink-yellow to brown and red-brown. The photo shows the initial stage of lichen planus [9] .

The main cause of development is the growth of yeast on the surface of the skin. They develop in a warm, moist and oily environment, multiplying and forming small colonies. Ringworm is most often diagnosed in teenagers and people under the age of 30, while it is rare in children and the elderly.

Taking some drugs, for example, immunosuppressants, glucocorticosteroids can provoke lichen planus. Uncontrolled drug therapy also often causes ringworm. Ringworm is not contagious. The disease cannot be transmitted from person to person, as it is caused by the pathological growth of fungi, which are representatives of normal skin microflora [6, 19] .

Diagnostics. An infectious disease can affect areas of the skin, but how and with what to treat lichen planus. A dermatologist can diagnose such a fungal infection. He conducts an examination, prescribes the necessary tests. Among which are scrapings, Wood's lamp illumination, skin exfoliation analysis, and for a general assessment, the patient must give blood and urine.

Therefore, such types of lichen are considered the most widespread. Having analyzed the etiology, symptoms and the most modern and effective types of diagnosis of this disease, we can talk about the treatment of all types or one type of disease .

1. 3 . The main approaches to the treatment of ringworm

Treatment is a long and not always pleasant process, but staying with a disease that is progressing is dangerous and can lead to irreversible changes in our body. This is the only way to either permanently get rid of the disease or, in case the disease is incurable, to reduce the symptoms of the disease and enable a person to feel more comfortable in his body. Treatment should be of high quality, selected by qualified doctors and pharmacists. After all, if you approach this issue not seriously, neglect the rules of taking medicines, the symptoms can appear faster and be more severe.

And this can seriously affect not only the quality of your life, but also its duration [15] .

It should be noted that self-treatment not only of lichen, but also of any disease, can negatively affect human health. It is not only difficult, but also very dangerous for a person without medical or pharmaceutical education, using Internet sources or relying on the advice of acquaintances, to choose the type of dosage form, dosage, time of taking the drug and the drug itself [34].

The route of administration of the drug is the route by which the selected medicinal form enters the body, in order to carry out further medicinal action in it. There are three main ways of introducing the medicine into the body:

1. Local route of entry.

It is characterized by an effect on the outer coverings and mucous membranes (eye drops; nasal spray; ear drops; aerosols, vaginal suppositories). It is also possible to single out some physiotherapeutic procedures, such as phonophoresis (ultrasound) and medical electrophoresis, with the use of which a deeper introduction of the drug into the tissues is noted.

2. Enteral route of administration.

It involves the introduction of drugs through the gastrointestinal tract. In turn, it can be used orally (through the mouth), rectally (for example, candles in the rectum) and sublingually (under the tongue).

3. Parenteral route of administration.

This variant of the route of administration of drugs involves injection, that is, such a method of administration of drugs or vaccines, in which the drug ends up in our body without entering the gastrointestinal tract. These can be subcutaneous, intramuscular, intravenous injections [16] .

Speaking about such a disease as ringworm, it should be noted that the disease itself does not pose a serious danger, but it makes life much more difficult. Due to the fact that when lichen is transferred, human immunity decreases, there is a high probability of developing a secondary infection, when other pathogenic

microorganisms join our disease, causing a new disease. In addition, the disease may worsen at times, which adds to the difficulties [8].

Each of the types of lichen has its own nature of occurrence, so they need to be treated with different drugs and treatment regimens. After all, if we treat pink lichen with the same drugs as shingles, we will not see the effect and our efforts and spent finances will be unjustified. That's why it's important to turn this question to a specialist. Only after the examination and diagnosis can you turn to a pharmacist and start the path to recovery [12] .

Treatment of lichen planus. Lichen planus affects approximately 1% of the population worldwide. About 10% of sufferers have nail lichen planus, while half of sufferers have oral lichen planus, which is more common in women than men. Lichen planus can have a chronic relapsing and relapsing course. In most people, lichen planus usually resolves within a few years, but postinflammatory pigmentation may persist for years [45] .

Common treatments for this type of ringworm include avoiding soaps and shower gels that make itchy. Use emollients. It is possible to use sedative antihistamine drugs that help to cope with unpleasant night itching.

Local treatment of symptomatic skin or mucous membrane disease: local corticosteroids, local calcineurin inhibitors. Topical retinoids, intralesional steroid injections. Systemic treatment of disseminated lichen planus or severe local disease often includes a 1- to 3-month course of systemic steroids [34] .

Treatment of pink lichen. In most cases, Giber's lichen planus goes away on its own and may not require treatment. In order to avoid complications, patients are advised to follow a hypoallergenic diet during the illness, limit water treatments, avoid rubbing the skin with a washcloth, avoid using body cosmetics, and wear only cotton underwear.

In case of severe itching, antihistamine drugs are prescribed internally, and corticosteroid and antipruritic ointments and gels are prescribed externally. According to some dermatological studies, the use of erythromycin and acyclovir

from the first days of the disease gives a good effect in Giber's pink lichen. Such treatment promotes quick recovery without complications.

Treatment of ringworm. How to treat this type of ringworm depends on where it is located and how severe the area is affected. In many cases, a doctor may recommend over-the-counter medications that can be purchased at a pharmacy. If ringworm appears on the skin, an antifungal cream, lotion or powder is suitable . One of the most popular are Clotrimazole and Miconazole [12] .

In most cases, the treatment continues for 2-4 weeks, after which we need to make sure that we kill the fungus that causes ringworm. Careful and timely treatment reduces the chances of re-infection. If ringworm affects the scalp, over-the-counter treatment may not be enough. Your doctor will need to write you a prescription [15] .

Treatment of shingles. There is no cure for shingles. There are only medicines that can make you feel better. Early treatment with prescription antiviral drugs can speed healing and reduce the risk of complications. These medications are most effective if you start taking them as soon as possible after the rash appears. These drugs include:

Acyclovir (Zovirax)

Famciclovir

Valacyclovir (Valtrex).

Shingles can cause severe pain, so your doctor may also prescribe:

Capsaicin topical patch (Qutenza)

Anticonvulsants such as gabapentin (Neurontin, Gralise, Horizant)

Tricyclic antidepressants such as amitriptyline

Pain relievers such as lidocaine in the form of a cream, gel, spray or skin patch [23] .

Shingles usually lasts 2 to 6 weeks. Most people get this type of ringworm only once. But its relapse is possible.

Conclusions to section 1

1. Therefore, such types of lichen are considered the most widespread. Having analyzed the etiology, symptoms and the most modern and effective types of diagnosis of this disease, we can talk about the treatment of all types or one type of disease.
2. The limited range of extemporaneous ointments determines the urgency of developing a new ointment based on synthetic and natural compounds for the symptomatic treatment of lichen planus.

SECTION 2

RESEARCH OBJECTS AND METHODS

When developing an extemporaneous ointment for the symptomatic treatment of ringworm, the following components were used: solcoseryl, ascorbic acid, pumpkin oil, tar.

Excipients: glycerin, glyceryl stearate citrate, purified water.

2.1 Research objects

Solution for injections Solcoseryl 42.5 mg/ml, 5 ml was chosen as the object of the study. MEDA Pharmaceuticals Switzerland GmbH. Also ascorbic acid, pumpkin oil, birch tar. As auxiliary substances: glyceryl stearate citrate, glycerin, purified water.

Solcoseryl:

- supports aerobic metabolism and oxidative phosphorylation, and also contributes to the replenishment of cells that do not receive sufficient nutrition with high-energy phosphates;
- increases in vitro oxygen utilization and glucose transport in tissues and cells that suffer from hypoxia and are metabolically exhausted;
- improves the processes of repair and regeneration of damaged tissues with insufficient nutrition;
- prevents or reduces secondary degradation and pathological changes in reversibly damaged cellular systems;
- accelerates collagen synthesis in in vitro models;
- stimulates cell proliferation and migration in vitro.

Ascorbic acid ($C_6H_8O_6$) has a number of pharmacological activities:

- antioxidant;
- synthesizes collagen;
- synthesizes carnitine;

- synthesizes neurotransmitters (norepinephrine and serotonin);
- detoxification and removal of chemicals;
- modulation of immunity;
- breakdown and removal of cholesterol;
- promotes iron absorption;
- protects folates and vitamin E from oxidation and maintains these vitamins in an active form;
- control of the level of histamine in the blood.

Effect on the skin:

- tightens blood vessels, affects the synthesis of type I and III collagen. Collagen I III -
- the main components of the dermis and a substance that seals the plates of blood vessels.
- has anti-inflammatory properties - they arise due to a decrease in the activity of the nuclear transcription factor NFk-B, which is responsible for the production of pro-inflammatory cytokines, in particular interleukin 10 (IL-10). Interleukin 10 (IL-10), as one of many pro-inflammatory cytokines, is also responsible for maintaining local inflammation, due to which the skin needs more time to recover.
- improves protection against UV rays, which means it reduces erythema caused by UV rays, making it an ideal addition to sun filters [43, 44, 45].
- has a whitening effect - i.e. it shows the ability to inhibit the enzyme tyrosinase, which is involved in the formation of melanin - the skin pigment. This weakens the formation of the dye and reduces the existing amount of it, which leads to lightening of the skin, and with long-term use it evens out its color.

Pumpkin oil contains the following biologically active substances:

- vitamins A, B1, B2, B6, C, E, K, P, PP
- phospholipids, carotenoids, tocopherols, flavonoids
- minerals, macro- and microelements: magnesium, iron, selenium, zinc,

potassium, calcium and others

One of the undeniable advantages of pumpkin oil is the presence of a complex of polyunsaturated fatty acids: vitamin F, Omega-3 and Omega-6 fatty acids. It stimulates immunity, increases resistance to infections, improves the motor function of the intestines and biliary tract, has a pronounced antioxidant and hepatoprotective effect, reduces swelling, has anti-allergic properties, has a wound-healing and anti-inflammatory effect, protects against premature aging, fights free radicals, regulates carbohydrate and lipid metabolism. Thanks to taking this oil, it activates metabolic processes in the tissues.

Tar. The use of birch tar for therapeutic and preventive purposes allows us to improve blood circulation, also accelerate the process of skin regeneration and provides a reflex effect on skin receptors. After a short period of action, it effectively neutralizes many types of bacteria.

Birch tar is effective in the treatment of such skin diseases as: ringworm, eczema, psoriasis, seborrheic eczema, folliculitis, fungal infections. After using birch tar, pain passes more quickly, itching and irritation are relieved, the skin is restored - the skin becomes clean [46, 47, 48].

2.2 Research methods

In the process of performing the work, modern pharmaco-technological and physico-chemical research methods were used, which allow for objective assessment of the used samples of initial components, intermediate products and finished medicinal products.

According to the requirements of the First Edition of the Federal Drug Administration (DFU 1.2, p. 312), soft medicinal products are controlled by the following quality indicators: description, identification, uniformity, weight of the container contents, microbiological purity, quantitative determination. If necessary, the particle size, pH, characteristic properties of the base, accompanying impurities, and the tightness of the container are additionally controlled. Their brief description with reference to the source (DFU, DST, TU, etc.) is given in this section.

Physico-chemical research methods

Description . Control the appearance and characteristic organoleptic properties of samples (color, smell, consistency, etc.). To do this, smears of ointments applied to a glass slide with a layer of 2-4 mm are reviewed using color standards [49].

Homogeneity was determined according to the method of DFU I ed., p. 511 with visual control of test samples on a glass slide. The ointment should be homogeneous (not have visible particles, foreign inclusions, signs of physical instability: aggregation, coalescence, coagulation of particles).

Determination of colloidal stability (GOST 29188.3-91 "Cosmetic products. Methods for determining the stability of emulsions"). To conduct the test, a laboratory centrifuge with a set of test tubes, a mercury thermometer with a temperature measurement interval from 0 to 100 °C and a division value of 1 °C, a stopwatch and a water bath were used. The test tube was filled to 2/3 of the volume (approximately 9.0 g) with the tested ointment samples. Then the test tubes were placed in a water bath at a temperature of 45 ± 2 °C for 20 min. Centrifuged for 5 min. The sample is considered stable if no delamination was observed in the test tubes after centrifugation [50, 51].

Determination of thermal stability (GOST 29188.3-91 "Cosmetic products. Methods for determining the stability of emulsions"). A test tube with 10 g of ointment was placed in a TV-80-1 thermostat with a temperature of 40-42 °C, left for one week, then transferred to a refrigerator with a temperature of 10-12 °C for the same period, after which it was kept for 3 days at room temperature.

Determination of the pH of water extracts . For this purpose, 5.0 g of ointment (precise measure) was placed in a chemical beaker with a capacity of 100 ml and dissolved in 50 ml of purified water while stirring with a glass rod, left for 10 minutes for the sedimentation of insoluble components, after which the pH value of the obtained aqueous dispersion was determined potentiometrically (DFU 1st ed., supplement 1 (2004), item 2.2.3, p. 17) [52, 53, 54].

CHAPTER 3

JUSTIFICATION OF THE COMPOSITION AND TECHNOLOGY OF THE OINTMENT FOR THE TREATMENT OF LISH

3.1 Peculiarities of drug penetration through the skin

The route of administration of medicinal substances through the skin has an important advantage - their delivery directly to the diseased organ. Most drugs that are administered parenterally or through the gastrointestinal tract are not dermatotropic and do not have the ability to accumulate in sufficiently high concentrations in the skin. Attempts to increase therapeutic concentrations in the skin by increasing doses of solid or liquid dosage forms lead to the appearance of side effects. Local application of medicinal substances, on the contrary, is devoid of many of the listed disadvantages.

When applying drugs to the skin, various tasks can be solved:

- keep the substance without penetrating the skin, introduce it into the stratum corneum,
- to the epidermis, dermis, hair follicles, sebaceous glands or, without delay
- substance in the skin, enter it into the body to provide a systemic effect.

The skin is a complex system of layers with different structural, functional and physicochemical properties. The skin is a multifunctional membrane. An intact keratin layer acts as a depot from which medicinal drugs penetrate deeper into the skin. The mechanism of penetration of exogenous substances through the skin is a complex and diverse process, which is associated with the complex morphological structure of the skin. In the stratum corneum, in addition, there are polar and non-polar layers. Any substance, before penetrating through these barriers, must come into contact with the water-lipid film and horn cells. There are many factors that affect the permeability of various substances:

- state of the water-lipid film of the skin; genetic and hormonal

differences;

- nature of contacting substances, use of penetrants, cellular
- cell surface and reaction, external factors, skin damage.

When it comes to the permeability of the skin, it should be borne in mind that this term means a set of processes with different mechanisms. Penetration (from the external environment to the skin and vice versa) can be different for water- or fat-soluble substances, for compounds with a small or large molecular weight, which in many ways accelerates or slows down this process. In addition, the localization of the skin area, the degree of its hydration, the thickness of the stratum corneum, the presence or absence of a lipid layer and its qualitative composition make significant adjustments to the rate of penetration of substances through the skin. These features are important from a practical point of view, because the choice of non-aqueous solvents depends on this when developing the composition of a soft dosage form for the treatment of infectious and inflammatory skin diseases.

3.2. Justification of the choice of the type of ointment base

The therapeutic effect of the drug for local use depends on the active components and on the correctly selected composition of auxiliary substances, taking into account the symptoms of the course of the disease. Therefore, when developing the composition of the soft dosage form, the following principles of treatment were taken into account:

1) reliable protection of damaged tissue from mechanical impact and other negative factors;

2) moderate drying effect;

3) normalization of exchange processes thanks to restoration of microcirculation;

4) targeted stimulation of reparative processes;

5) acceleration of epithelization.

These areas of treatment can be ensured by performing the following requirements:

- reduction of wound and perifocal inflammation in tissues due to a moderate dehydrating effect;
- maintaining the viability of damaged tissues;
- restoration of microcirculation;
- stabilization of cell membranes;
- immunomodulatory effect.

The therapeutic value of ointments depends on the rational choice of the ointment base, since the latter significantly affects the speed and completeness of the release of medicinal substances, the therapeutic activity of the drug. In the works published in recent years, the results of research are presented, which allow us to conclude that the bases for ointments, according to their ability to ensure the most intensive release and resorption of active substances, can be placed in the following series: gels of hydrophilic substances - emulsion bases of the o/w type - emulsion bases of the in/o type are absorptive and strongly hydrophobic. For the treatment of dermatological diseases, hydrophilic and diphilic bases are widely used, which are convenient to use (easily applied and washed off the skin), do not have an irritating effect, and have a cooling effect [56, 58, 60].

Justification of the choice of the emulsion base

A rational combination of water and fats in the composition of emulsions, which provides a number of vital functions of both the skin and the body as a whole. The water-oil system, close in nature and composition to the natural components of the skin, is able to actively influence the processes occurring in the skin structures. The presence of water promotes wetting and hydration of the skin surface, which, in turn, increases its sorption properties. The high bioavailability of emulsions is due to the ability of the hydrated skin surface to increase its "permeability". Activation of absorption is largely provided by surface-active substances (surfactants) - a mandatory component of emulsion systems capable of degreasing the skin surface by solubilizing native lipids and destructuring natural proteins, which contributes to increased skin permeability.

Fats, in turn, being a carrier of natural nutrients, are able to functionally replace skin lipids when they are lacking; - the possibility of introducing into emulsion systems substances with various physicochemical properties capable of actively influencing biochemical processes in skin structures (amino acids, mineral salts, carbohydrates, fatty acids, vitamins, hormones, etc.), which allows to increase their bioavailability and directed affect certain violations of the structure and properties of the skin surface; the ability to vary the consistency and level of exposure, determined by the purpose of the ointment, depending on the physical and chemical properties of the substances that make up the emulsion ointment.

Glyceryl stearate citrate: A safe emulsifier approved for use in cosmetics, pharmaceuticals and the food industry, which has emulsion-stabilizing properties. Helps retain moisture, has a softening effect on the skin. Significantly thickens the formulation of cosmetics. In recipes with a large amount of oil phase and in the presence of batters, it is able to give non-greasy creams that are pleasant to the senses.

The advantage of this emulsifier is its versatility in making recipes for any type of skin, including sensitive, irritated skin. Can be successfully combined with other emulsifiers to reduce the HLB level of the final formulation. Then it is mixed with the water phase heated to the same temperature. The phases are heated in separate containers. Next, both phases are mixed with a spatula or whipped with a minimixer. When cooling, the mixture hardens. Unlike pure glycerin, stearate (without citric acid residue) can independently form emulsions, due to the "lemon" residue, it is quickly absorbed and moisturizes [57, 59, 61].

3.3. Justification of the choice of active and auxiliary substances in the composition of the ointment

Solcoseryl

Solcoseryl is a stimulator of tissue regeneration. It is a deproteinized dialysate from the blood of dairy calves, which contains a wide range of low-molecular components of cell mass and serum with a molecular mass of 5000 D (including glycoproteins, nucleosides and nucleotides, amino acids, oligopeptides). Solcoseryl

improves the transport of oxygen and glucose to cells in hypoxic conditions, increases the synthesis of intracellular ATP and promotes an increase in the dose of aerobic glycolysis and oxidative phosphorylation, activates reparative and regenerative processes in tissues, stimulates the proliferation of fibroblasts and the synthesis of collagen in the vessel wall.

Indications for use: Minor skin damage, 1st and 2nd degree burns, frostbite, wounds that are difficult to heal.

Contraindications: Children and adolescents under 18 years of age, pregnancy, lactation, established hypersensitivity to active components.

With caution: With hyperkalemia, renal failure, heart rhythm disorders, oliguria, anuria, pulmonary edema.

Ascorbic acid

Ascorbic acid takes an active part in redox reactions, has a non-specific general stimulating and antioxidant effect on the body. Increases the adaptive capabilities of the body and its resistance to infections, promotes regeneration processes. It is used for the prevention and treatment of vitamin C hypo- and vitamin C deficiency.

As an auxiliary means: hemorrhagic diathesis, nasal, uterine, pulmonary and other bleeding, radiation sickness; overdose of anticoagulants, infectious diseases and intoxications, liver diseases, nephropathy of pregnant women, Addison's disease, slow-healing wounds and bone fractures, dystrophy and other pathological processes. The drug is prescribed for increased physical and mental stress, during pregnancy and breastfeeding, intensive growth, during stress, during recovery after long and severe illnesses.

Ascorbic acid tones the vessels of the circulatory system and makes their walls more dense. And it also helps to produce collagen, which is the structural protein that the skin is made of.

- strengthening of the immune system of the skin;
- restoring and whitening effect;
- restoration of firmness and elasticity, activation of collagen production

processes;

• protection of the skin from premature aging, restoration of oxidative forms of other useful components, including vitamin E.

Strengthens the epidermal barrier. Stimulates the synthesis of skin lipids, which contribute to the retention of moisture in the skin.

Contraindications: Hypersensitivity to the components of the drug, thrombophlebitis, tendency to thrombosis, diabetes.

With caution: hyperoxalaturia, renal failure, hemochromatosis, thalassemia, polycythemia, leukemia, sideroblastic anemia, glucose-6-phosphate dehydrogenase deficiency, sickle cell anemia, progressive malignant diseases, pregnancy.

Pumpkin oil contains the BAR complex of pumpkin seeds (carotenoids, tocopherols, phospholipids, phosphatides, flavonoids, vitamins B1, B2, C, P, PP, F, unsaturated, polyunsaturated, semisaturated fatty acids: stearic, palmitic, oleic, linolenic, arachidonic linoleic , which cause anti-inflammatory antioxidant, antisclerotic, hepatoprotective, choleretic effect. The drug reduces swelling and improves microcirculation and epithelization, has a protective effect on granulation, stimulates trophic and metabolic processes in tissues. The drug has an antihypertensive effect, inhibits the proliferation of cells of the prostate gland in its benign state hyperplasia, reduces the severity of inflammatory processes, exhibits minor bacteriostatic properties.

Birch tar

The benefit of this valuable substance is determined by its special chemical composition. Among other useful substances it contains:

– phytoncides;
– organic acids, including salicylic;
– phenol;
– toluene;

In addition, birch tar is a rich source of cresol, which accounts for most of the beneficial properties of the tree extract.

Due to its properties, birch tar has a rather colossal benefit for the body.

Moreover, it is used both for external and internal use. Tar products help not only to clean the skin of dirt and get rid of harmful microorganisms, but also effectively relieve various inflammations. This property allows the use of this extract in the treatment of skin diseases. For the same reason, it serves as the main component of Vishnevsky and Wilkinson ointments.

Tar also has analgesic properties, accelerates tissue regeneration and eliminates itching. In addition, supporters of alternative medicine note the beneficial effect of tree extract on metabolism. Active substances in its composition regulate metabolic processes, remove harmful toxins from the body and accelerate blood circulation, which has a beneficial effect on human well-being and even contributes to weight loss.

3.4 Development of composition and technology of extemporaneous ointment

The following combinations of active substances with selected emulsifiers were chosen for the study (Table 3.1, Table 3.2).

Table 3.1

Compositions of model samples of ointments with lanolin

AFI	Composition 1	Composition 2
Solcoseryl (42.5mg/ml solution)	5 ml	5 ml
Ascorbic acid	2.0 g	2.0 g
Pumpkin oil	10.0	10.0
Birch tar	1.5	1.5
Glycerin	15.0	15.0
Lanolin is anhydrous	0.5 (1%)	5 (10%)
The water is purified	16 ml (up to 50.0)	11.5 ml (up to 50.0)
Total mass	*50.0*	*50.0*

These combinations of components were prepared taking into account the physicochemical properties of active and auxiliary substances.

Technology for samples 1, 2 [4, 7, 36, 54, 67, 69].

Stage I. Preparation of the oil phase: melt lanolin in a water bath in a porcelain cup at a temperature of 40-42 C, add pumpkin oil.°

Stage II. Prepare the aqueous phase: dissolve ascorbic acid in purified water, add a solution of solcoseryl, glycerin, birch tar.

Stage III. The last stage, forcing the products of *Stage I* and *Stage II* . Transfer the oil phase to a warm mortar and add to it the ready water phase from stage II, mix until cooling.

Table 3.2

Compositions of model samples of ointments with glyceryl stearate citrate

AFI	Composition 3	Composition 4
Solcoseryl (42.5mg/ml solution)	5 ml	5 ml
Ascorbic acid	2 g	2 g
Pumpkin oil	10.0	10.0
Birch tar	1.5	1.5
Glycerin	15.0	15.0
Glyceryl stearate citrate	0.5(1%)	5 (10%)
The water is purified	16 ml (up to 50.0)	11.5 ml (up to 50.0)
Total mass	*50.0*	*50.0*

These combinations of components were prepared taking into account the physicochemical properties of active and auxiliary substances.

Technology for samples 3, 4.

Stage I. Preparation of the oil phase: melt glyceryl stearate citrate in a water bath in a porcelain cup at a temperature of 56-66 C, add pumpkin oil.°

Stage II. Prepare the aqueous phase: dissolve ascorbic acid in purified water, add a solution of solcoseryl, glycerin, birch tar.

Stage III. The last stage, forcing the products of *Stage I* and *Stage II* . Transfer the oil phase to a warm mortar and add to it the ready water phase from stage II, mix until cooling.

Organoleptic indicators and physicochemical parameters (pH, thermal stability) were determined in the obtained samples. The results of the research are

given in the table. 3.3, 3.4 indicate that the samples of ointments 1, 2 and 3 during the entire observation period (up to 30 days) had satisfactory indicators - they were homogeneous and did not delaminate. However, on the 30th day of storage, delamination of the ointment is observed in these samples. Therefore, ointment sample 4 was used for further studies.

Table 3.3

Organoleptic indicators of the quality of the tested samples of ointments

Research term	Appearance –	Scent	Color
Warehouse No. 1			
beginning	homogeneous ointment of a soft consistency	The smell of tar	Dark grey
1 day	-----	-----	-----
10 days	-----	-----	-----
30 days	-----	-----	-----
Warehouse No. 2			
beginning	homogeneous ointment of a soft consistency	The smell of tar	Dark grey
1 day	-----	-----	-----
5 days	-----	-----	-----
30 days	-----	-----	-----

Research term	Appearance –	Scent	Color
Composition No. 3			
beginning	homogeneous ointment of a soft consistency	The smell of tar	Dark grey
1 day	-----	-----	-----

10 days	-----	-----	-----
30 days	-----	-----	-----
Warehouse No. 4			
beginning	homogeneous ointment of a soft consistency	The smell of tar	Dark grey
1 day	-----	-----	-----
5 days	-----	-----	-----
30 days	-----	-----	-----

Thus, on the basis of comprehensive research, the following composition (Table 3.5) was selected and the technology (Fig. 3.1) of extemporaneous ointment for the symptomatic treatment of ringworm was developed.

Table 3.4

Study of thermal stability of ointment samples during storage

Research term	Thermal stability (delamination)
Composition 1	
1 day	Not observed
10 days	------
30 days	Stratification is observed
Composition 2	
1 day	Not observed
10 days	------
30 days	Stratification is observed
Composition 3	

1 day	Not observed
10 days	------
30 days	Stratification is observed
Composition 4	
1 day	Not observed
10 days	------
30 days	------

Ointment technology

Stage I. Preparation of the oil phase: melt glyceryl stearate citrate in a water bath in a porcelain cup at a temperature of 56-66 C, add pumpkin oil.°

Stage II. Prepare the aqueous phase: dissolve ascorbic acid in purified water, add a solution of solcoseryl, glycerin, birch tar.

Stage III. The last stage, forcing the products of *Stage I* and *Stage II* . Transfer the oil phase to a warm mortar and add to it the ready water phase from stage II, mix until cooling.

Table 3.5

Selected composition of extemporaneous ointment

AFI	Composition 4
Solcoseryl (solution)	5 ml
Ascorbic acid	2 ml
Pumpkin oil	1.5
Birch tar	1.5
Glycerin	15.0

Glyceryl stearate citrate	5.0
The water is purified	11.5 ml (up to 50.0)
Total mass	*50.0*

Conclusions to chapter 3

1. The expediency of introducing selected pharmaceutical ingredients into the composition of the ointment for the symptomatic treatment of ringworm is theoretically substantiated.

2. Experimentally selected emulsifier - glyceryl stearate citrate and its amount.

3. Thanks to physico-chemical studies, the chosen composition of the ointment and ointment base was confirmed.

4. In the course of the study, it was proven that during storage of the ointment of the selected composition for 30 days at a temperature of 2-8 °C, the organoleptic and physicochemical parameters of the ointment do not change significantly.

5. An extemporaneous ointment technology for the symptomatic treatment of ringworm is proposed.

GENERAL CONCLUSIONS

1. The methods of symptomatic therapy and the modern assortment of ready-made medicines for the symptomatic treatment of ringworm are analyzed.

2. The appropriateness of the introduction of selected pharmaceutical ingredients into the extemporaneous combined action ointment is theoretically substantiated.

3. Thanks to physico-chemical and pharmaco-technological studies, the composition of the ointment was selected for the symptomatic treatment of psoriasis.

4. The stability of the proposed extemporaneous ointment during storage for 30 days at a temperature of 2-8 °C was analyzed and studied .

5. The proposed rational technology of extemporaneous ointment.

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Ф А 2.2.1–32-366

National University of Pharmacy

Faculty for foreign citizens' education
Department Technology of Drugs

Level of higher education master

Specialty 226 Pharmacy, industrial pharmacy
Educational program Pharmacy

APPROVED
The Head of Department
Technology of Drugs
_Tatyana YARNYKH
"_28_" _September_ 2022

ASSIGNMENT
FOR QUALIFICATION WORK
OF AN APPLICANT FOR HIGHER EDUCATION

Luseko John CHAKINDO

1. Topic of qualification work: «Development of the composition and technology of extemporaneous gel for the treatment of lichen planus», supervisor of qualification work: Marina BURYAK, PhD, assoc. prof.,

approved by order of NUPh from "1" of September 2022 № 197-ст

2. Deadline for submission of qualification work by the applicant for higher education: April 2023.

3. Outgoing data for qualification work: development of the composition and technology of an extemporaneous gel on components of plant origin for use in dermatology.

4. Contents of the settlement and explanatory note (list of questions that need to be developed): analyze modern approaches to the treatment of lichen planus; to analyze the modern assortment of ready-made and extemporaneous medicinal forms for the treatment of various types of ringworm; theoretically and experimentally substantiate the development of the composition of the ointment, taking into account the physical and chemical properties of the substances included in its composition; to study the stability of the developed ointment during storage..

5. List of graphic material (with exact indication of the required drawings):
3 tables, 4 figures

6. Consultants of chapters of qualification work

Chapters	Name, SURNAME, position of consultant	Signature, date	
		assignment was issued	assignment was received
I Chapter	Marina BURYAK, assistant professor of higher education institution of department drug technology	28/09/2023	28/09/2023
II Chapter	Marina BURYAK, assistant professor of higher education institution of department drug technology	28/09/2023	28/09/2023
III Chapter	Marina BURYAK, assistant professor of higher education institution of department drug technology	28/09/2023	28/09/2023

7. Date of issue of the assignment: «_28_» _September_ 2022

CALENDAR PLAN

№ з/п	Name of stages of qualification work	Deadline for the stages of qualification work	Notes
1.	Analysis of literature data. Treatment of nervous system diseases, analyze of pharmaceutical market of homeopathic drugs and their dosage forms.	September – November 2022	**done**
2.	Researches of active substances and excipients	December 2022 – February 2023	**done**
3.	Justification of the results	March 2023	**done**
4.	Registration of qualification work	April 2023	**done**

An applicant of higher education _____Luseko John CHAKINDO

Supervisor of qualification work _____Marina BURYAK

ВИТЯГ З НАКАЗУ № 197-ст
По Національному фармацевтичному університету
від 01 вересня 2022 року

1. нижченаведеним студентам 5-го курсу 2 циклу 2022-2023 навчального року, навчання за освітньо-кваліфікаційним рівнем «магістр», галузь знань 22 охорона здоров'я, спеціальності 226 – фармація, промислова фармація, освітня програма – фармація, денна форма навчання (термін навчання 4 роки 10 місяців), які навчаються за контрактом, затвердити теми кваліфікаційних робіт:

№ з/п	Прізвище студента	Тема кваліфікаційної роботи	Посада, прізвище та ініціали керівника	Рецензент кваліфікаційної роботи
• **по кафедрі технології ліків**				
3	Чакіндо Лусеко Джон	Розробка складу та технології екстемпорального гелю для лікування лишаю Development of the composition and technology of extemporaneous gel for the treatment of lichen planus	доц. Буряк М.В.	проф. Толочко К.В.

Ректор

Вірно. Секретар

Ф А2.8-47-110

ВИСНОВОК

Комісії з академічної доброчесності про проведену експертизу

щодо академічного плагіату у кваліфікаційній роботі

здобувача вищої освіти

№ 113674 від « 25 » травня 2023 р.

Проаналізувавши випускну кваліфікаційну роботу за магістерським рівнем здобувача вищої освіти денної форми навчання Чакіндо Лусеко Джон, 5 курсу, _____ групи, спеціальності 226 Фармація, промислова фармація, на тему: «Розробка складу та технології екстемпорального гелю для лікування лишаю/ Development of the composition and technology of extemporaneous gel for the treatment of lichen planus», Комісія з академічної доброчесності дійшла висновку, що робота, представлена до Екзаменаційної комісії для захисту, виконана самостійно і не містить елементів академічного плагіату (компіляції).

Голова комісії,

професор **Інна ВЛАДИМИРОВА**

2%

18%

Ф А 2.2.1-32-353

REVIEW

of scientific supervisor for the qualification work of the master's level of higher education of the specialty 226 Pharmacy, industrial pharmacy

Luseko John CHAKINDO

on the topic: "Development of the composition and technology of extemporaneous gel for the treatment of lichen planus "

Relevance of the topic. Almost everyone has encountered skin problems. Acne and pimples, oily sheen, enlarged or blocked pores, blackheads, white subcutaneous "grains", vascular defects, skin peeling, pigmentation, etc. This list can be continued. But the only question that worries the owners of these defects is what to do to solve the issue of problematic skin. According to statistics in Ukraine, 85% of young people aged 12 to 25 and 11% over 25 have problem skin.

Practical value of conclusions, recommendations and their validity. The approaches proposed by the acquirer to the development of the optimal composition of extemporaneous ointment can be used in the production process of pharmacies in the production of soft dosage forms.

Assessment of work. The work was performed at a sufficient theoretical and practical level of scientific research. The qualification work contains substantiated conclusions and has practical significance.

General conclusion and recommendations on admission to defense. The qualifying work of Luseko John CHAKINDO was completed at the appropriate scientific level and can be submitted for defense to the Examination Commission of the National University of Pharmacy.

Scientific supervisor _____ Maryna BURYAK

12 April 2023

Ф А 2.2.1-32-356

REVIEW

of scientific supervisor for the qualification work of the master's level of higher education of the specialty 226 Pharmacy, industrial pharmacy

Luseko John CHAKINDO

on the topic: "Development of the composition and technology of extemporaneous gel for the treatment of lichen planus"

Relevance of the topic. Natural products are one of the sources of drugs in the pharmaceutical industry, one of the most famous sources of natural products are medicinal plants. Medicinal plants are able to treat some specific diseases and can be a potential source of drugs.

Many important medicines are natural products or are derived from them. Thus, almost 39% of all drugs approved by the Food and Drug Administration (FDA, USA) are of natural origin, and 48.6% of all cancer drugs registered from the 1940s to today are or are natural products or their derivatives. Natural products are important sources in the drug discovery process. There are more than 200,000 natural metabolites that have different bioactive properties, which indicates the importance of products of natural origin for the creation of new medicines based on them.

Theoretical level of work. The work carried out by the acquirer on the analysis of literature data on the researched issue is thorough and systematized.

Author's suggestions on the research topic. Based on the analysis of literature data and the conducted experiment, the author proposed the optimal composition of the dosage form.

Practical value of conclusions, recommendations and their validity. The results of the work can be used in the production process of pharmacies in the production of soft dosage forms.

Disadvantages of work. The work contains unsuccessful expressions, spelling and grammatical errors, incompleteness of conclusions.

General conclusion and assessment of the work. The composition and content of Luseko John CHAKINDO qualifying work meets the requirements and can be submitted for defense to the Examination Commission of the National Pharmaceutical University .

Reviewer _____ assoc. prof. Kateryna SEMCHENKO

28 April 2023

Ф А2.2.1-91-287

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ

ВИТЯГ З ПРОТОКОЛУ № _11_
«28» квітня 2023 року
м. Харків

засідання кафедри
технології ліків

Голова: завідувачка кафедри, доктор фарм. наук, професор Тетяна ЯРНИХ
Секретар: канд. фарм. наук, асистент Світлана ОЛІЙНИК

ПРИСУТНІ: професор Тетяна ЯРНИХ, професор Олександр КОТЕНКО, професор Юлія ЛЕВАЧКОВА, професор Ріта САГАЙДАК-НІКІТЮК, доцент Марина БУРЯК, доцент Володимир КОВАЛЬОВ, доцент Наталія ЖИВОРА, асистент Світлана ОЛІЙНИК, асистент Єлизавета ЗУЙКІНА

ПОРЯДОК ДЕННИЙ

1. Про представлення до захисту до Екзаменаційної комісії кваліфікаційних робіт здобувачів вищої освіти.

СЛУХАЛИ: проф. Тетяну ЯРНИХ – про представлення до захисту до Екзаменаційної комісії кваліфікаційних робіт здобувачів вищої освіти.

ВИСТУПИЛИ: Здобувач вищої освіти 5 курсу групи Фс18(4,10д)-01 спеціальності 226 Фармація, промислова фармація Лусеко Джон ЧАКІНДО з доповіддю на тему «Розробка складу та технології екстемпорального гелю для лікування лишаю» (науковий керівник: доцент закладу вищої освіти Марина БУРЯК).

УХВАЛИЛИ: Рекомендувати до захисту кваліфікаційну роботу.

Голова
Завідувачка кафедри, проф. _____ **Тетяна ЯРНИХ**
(підпис)

Секретар
асистент _____ **Світлана ОЛІЙНИК**
(підпис)

Ф А2.2.1-32-042

НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ

ПОДАННЯ
ГОЛОВІ ЕКЗАМЕНАЦІЙНОЇ КОМІСІЇ ЩОДО ЗАХИСТУ
КВАЛІФІКАЦІЙНОЇ РОБОТИ

Направляється здобувач вищої освіти Лусеко Джон ЧАКІНДО до захисту кваліфікаційної роботи за галуззю знань 22 Охорона здоров'я
спеціальністю 226 Фармація, промислова фармація
освітньою програмою Фармація
на тему: «Розробка складу та технології екстемпорального гелю для лікування лишаю».

Кваліфікаційна робота і рецензія додаються.

Декан факультету _____/ Світлана КАЛАЙЧЕВА /

Висновок керівника кваліфікаційної роботи

Здобувач вищої освіти Лусеко Джон ЧАКІНДО представив магістерську роботу, яка за об'ємом теоретичних та практичних досліджень повністю відповідає вимогам до оформлення магістерських робіт.

Керівник кваліфікаційної роботи

_____ Марина БУРЯК

«12» квітня 2023 року

Висновок кафедри про кваліфікаційну роботу

Кваліфікаційну роботу розглянуто. Здобувач вищої освіти Лусеко Джон ЧАКІНДО допускається до захисту даної кваліфікаційної роботи в Екзаменаційній комісії.

Завідувачка кафедри технології ліків

_____ Тетяна ЯРНИХ

«28» квітня 2023 року

Qualification work was defended

of Examination commission on

« ___» of June 2023

With the grade _____

Head of the State Examination

commission, DPharmSc, Professor

_____/ Oleh SHPYCHAK /