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and additional detergents. Also, we used conventional methods of research, namely historical, logical, comparative and structural. **Results.** Usually, in formulations of foaming agents, which are represented in the Ukrainian market, mostly detergents of anionic nature, such as sodium laureth sulfate, sodium lauryl sulfate, are presented. The washing properties in them provide a surface-active anion: a negatively charged particle of a molecule. It is the anions that give a massive foam. But since the surface of our skin has a polymozaic charge, the efficacy of cleaning with such a detergent is not the best one. Therefore, lately, modern manufacturers combine either nonionic and amphoteric detergents or combine them with mild anionic substances such as sodium mentresulfate, sodium laurylsarkosinate, magnesium laureth sulfate, and etc. After analyzing literary sources and taking into account the manufacturer's advice, we identified the main "soft" surfactants that are currently used: Magnesium Laureth Sulfate, Sodium Lauroyl Sarcosinate, Sodium Myethyrsulphate, Disodium Lauryl Sulfosuccinate, Disodium Laureth Sulfosuccinate, Disodium Ricinoleamido MEA-Sulfosuccinate, Sodium Laureth-11 Carboxylate, Laureth-7 Citrate. As additional detergents in foaming agents, various amphoteric, nonionic, some anionic and crypt-anionic detergents are commonly used. **Conclusions.** The analysis of the nomenclature and characteristics of modern detergents of different nature of origin, namely anionic, amphoteric and nonionogenic, is carried out. It has been established that a wide range of detergents is currently used, which can be used in various applications, for example, from children's foam to shower gels. It is noted that due to the use of detergents with minimal irritant action, it is possible to create a group of sputum funds not only with satisfactory consumer and physicochemical indicators, but also with a limited interval of pH.

Key words: foaming agent, detergents, additional detergents, anionic, amphoteric, nonionic

DEVELOPMENT OF THE COMPOSITION AND TECHNOLOGY OF EXTEMPORANEOUS SUPPOSITORIES WITH CLINDAMYCIN AND SEA BUCKTHORN OIL 21-24

Chushenko V.M., Yarnykh T.G., Osolodchenko T.P., Yuryeva G.B., Herasymova I.V.

Introduction. Antibacterial therapy certainly plays an important role in the treatment of these pathologies, although in most cases it causes allergic states, antibiotic resistance of various types of microorganism strains, and also a disfunction of normal vaginal biocoenosis. Anti-protozoal, antibacterial and antifungal agents are preferred, namely, ternidazole, metronidazole, fluconazole, clindamycin, miconazole, clotrimazole, nystatin, isoconazole etc. among the synthetic drugs used in gynecological practice. Prospective plant medicines for solving this problem are essential oils (tea tree, sea buckthorn, wormwood, chamomile), which provide inhibition of the development of pathogenic anaerobes. The aim of the work was to substantiate the composition and development of technology of combined vaginal suppositories (pessaries) with clindamycin phosphate and sea buckthorn oil for the treatment of infectious-inflammatory gynecological diseases. **Materials and methods.** Model samples of suppositories were prepared with 0.100 g of clindamycin phosphate and 0.500 g of sea buckthorn oil. Disperse system of suppositories with clindamycin and sea buckthorn oil is an emulsion of 1st type, therefore it is possible to use as emulsifiers the following substances: polysorbate-80, emulsion wax or alkaline soaps. Model samples of suppositories with clindamycin phosphate and sea buckthorn oil were checked by pharmaco-technological parameters (description, homogeneity, disintegration time, pH). The study of antibacterial properties of suppository model samples with clindamycin and sea buckthorn oil was carried out. **Results and discussion.** Samples of suppositories with polysorbate-80 become homogeneous and meet the requirements of the SPhU 2.0. The results of the conducted researches of pharmaco-technological parameters shown that model samples of suppositories with clindamycin phosphate and sea buckthorn oil meet the requirements of the SPhU 2.0 for the following parameters: description, homogeneity, disintegration time, pH. **Conclusions.** The composition and technology of suppositories with clindamycin phosphate and sea buckthorn oil for pharmacy preparation was developed. A technological instruction for the pharmacy preparation of suppositories has been developed and tested in the conditions of pharmacy.

Keywords: suppositories, technology, suppository base, clindamycin phosphate, sea buckthorn oil.

DETERMINATION OF MICROBIOLOGICAL PURITY OF TABLETS FOR THETREATMENT AND PREVENTION OF TYPE II DIABETES MELLITUS 25-28

Kovalevska IV, Ruban O.A., T. P. Osolodchenko

Introduction. Diabetes mellitus refers to a group of metabolic diseases characterized by hyperglycaemia, which occurs as a result of a defect in secretion or action of insulin. Chronic hyperglycaemia in diabetes mellitus (DM) leads to a damage, dysfunction and insufficiency of various organs, especially the eyes, kidneys, nerves, heart and blood vessels. Consistent hyperglycaemia activates the formation of free radicals, reduces the activity of antioxidant protection agents: superoxide dismutase, catalase, glutathione peroxidase, vitamins C and E. Therefore, special attention deserve anti-diabetic drugs which, along with the hypoglycaemic effect, have antioxidant properties, the ability to maintain or improve the secretory function of β-cells. The optimal compositions have been established and the technologies of medicinal products under the conventional names "Glycverin" with Voglibose and quercetin and "Thioquerin " on the basis of solid dispersion of thioctic acid were developed by previous studies. As a result of the study of specific pharmacological activity, it has been experimentally proved that the above drugs have a pronounced hypoglycaemic effect and increase the bioavailability of their components, which suggests its relevance in the treatment of type II diabetes. In order to increase biological availability, the method of solid dispersion has been utilized, which has significant advantages, among which: the use of drugs in solution or finely dispersed state provides a high dissolution rate, reduced irritating action on the gastric mucosa, a high therapeutic effect. However, during the technological process of obtaining non-sterile dosage forms, the preparation may be contaminated with microorganisms, which may reduce its stability during storage, which negatively affects its safety profile. Today, SPU clearly regulates the maximum level of contamination by microorganisms for each dosage form. **Material & methods.** The objects of the study were tablets under the conventional names "Glycverin" and "Thioquerin". Studies on the microbiological purity of the tablets were conducted in accordance with the requirements of the SPU, 2nd ed., p.2.6.12 and 2.6.13, category 3A (5.1.4, N). For the study used: soybean casein broth (HIMedia Laboratories Pvt.Ltd India » expiration date of the medium until XI 2019, Manufactured in India). For Candida albicans used Saburo-Dextrose Agar (Indian Production, «HIMedia Laboratories Pvt.Ltd India » expiration date of the environment until XI 2019). The environments were prepared according to the manufacturer's requirements (amount of powder per litre, pH, conditions of autoclaving, etc.). Each series used in the experiment was tested on growth quality in accordance with the reference documents. For tests on microbiological purity the following media were obtained on the basis of soy-casein agar: Chistovich's medium, blood agar. **Results & discussion**. Before conducting research on microbiological purity it was mandatory to test the compliance of the growth qualities of the nutrient media used. For this purpose, the nutrient media were inoculated with a small amount of an appropriate test strain of the microorganism (10 - 10^2 colony forming units per ml of medium - CFU / ml). The obtained data indicate that all microorganisms were consistent with the taxonomic designation of the strain, the morphology of the colonies when cultured on the media and cell morphology in microscopy were typical. Nutrient broths (soy-casein and thioglycolic medium) met the requirements for sterility - there was no growth of microorganisms, the environment was transparent. When testing on microbiological purity, the direct sowing method was used for liquid nutrient media. After 14 days of incubation, at cultivation on a Saburo, soy-casein broth and thioglycolic medium the growth of fungi was absent. In a deep sowing study, which was to add 0.1 g of preparation to agar and surface sowing of 0.1 g to agar, the amount of viable cells of microorganisms and fungi has been determined. The study of surface and deep sowing of drugs on Saburo dishes has shown no growth of fungi. The data obtained in Table 3 indicate that the number of microorganisms does not exceed 10^3 CFU / ml, which meets the requirements of the State Pharmacopoeia of Ukraine. **Conclusion**. The study of microbiological purity of tablets "Glycverin" and "Thioquerin" has been conducted. The results indicate absence of viable fungal cells. It has been established that the amount of viable cells of microorganisms does not exceed 10 3 CFU / ml in 1 g of the preparation, which meets the requirements of the SPU for

internal use preparations. Strains S. aureus, P. aeruginosa and representatives of Enterobacteriaceae sp. family have not been detected. Investigated samples of drugs meet the requirements of the Pharmacopoeia of Ukraine on the indicators of microbiological purity for oral preparations. The obtained results allow asserting the safety and expediency of further development of medicinal products for use in the treatment of type II diabetes mellitus.
Keywords: Diabetes mellitus, solid dispersion, microbiological purity, thioctic acid, quercetin

RESEARCH ON THE CHOICE OF RATIONAL CONCENTRATION OF THE GEL FORMING AGENT IN THE COMPOSITION OF DENTAL GEL 29-33

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Taking into account the wide spreading and etiopathogenetic features of the course of inflammatory diseases of periodontium and oral mucosa, it is rational to use semisolid drugs of local action, namely, dental gels. The main issue when developing this dosage form is the choice of the gel former and its concentration. Based on previous studies as the gel basis for the development of a new dental gel with «Phytodent» tincture, choline salicylate 80%, and lidocaine hydrochloride the Carbomer Polacril® 40P, which is authorized for use in dentistry and has the ability to form transparent viscous aqueous-alcohol gels, has been chosen. It is known that rheological characteristics of gels directly affect the processes of release and absorption of active pharmaceutical ingredients from a semisolid dosage form, as well as its consumer properties. The important issue is the convenience and ease of application of a dental gel to inflamed tissues of periodontium and mucous membranes. This process is similar to that occurring during the shift of visco-plastic material in a rotary viscometer. The aim of the work is to study the structural and mechanical characteristics of the developed dental gel in order to select the rational concentration of the carbomer Polacril® 40P. **Materials and methods**. The study objects are gel samples with different concentrations of Carbomer Polacril® 40P – 1.0, 1.25, 1.5, 1.75 and 2.0 %. Measurement of the rheological parameters of the model gel samples was carried out at a temperature (25 ± 0.1) oC on a rotary viscometer with coaxial cylinders "Rheolab QC" ("Anton Paar") before and after contact with a solution of artificial saliva. As standards for comparison dental gels "Dentinox-gel N" (Germany) and gel "Metrogyl Denta®" (India) were selected. **Results and discussion**. It has been found that all gel samples have a non-Newtonian pseudoplastic flow type and are thixotropic systems with pronounced limits of fluidity. The rheological parameters of the dental gel samples increase as the concentration of Carbomer Polacril® 40P increases. In the nature of rheograms and structural viscosity the closest indicators to the drug "Dentinox-gel N" have gels with carbomer concentration of 1.25 % and 1.5 %, and to the drug "Metrogyl Denta®" – 1.75 % and 2.0 %. **Conclusions**. Taking into account the results of structural and mechanical studies of gels with and without an artificial saliva solution, as well as in terms of profitability, the optimal concentration of Carbomer Polacril® 40P in the composition of the developed gel was chosen to be 1.5 %.
Keywords: dental gels, gel former, rheological studies.

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DEVELOPMENT OF THE POWDER COMPOSITION WITH THE SORBING, ANALGESIC AND ANTIMICROBIAL ACTIVITY BASED ON NATURAL ZEOLITE

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Introduction. An active lifestyle, playing sports, participating in hiking trips and various competitions, as well as performing certain types of physical labor may be accompanied by injury. Damage of the skin requires its immediate treatment. Powders are an alternative to soft dosage forms, which are usually used for this purpose. Powders are used in acute inflammatory skin diseases, with a hygienic purpose in increased sweating and sebum secretion, to protect the skin from external irritations, as well as for better fixation of ointments and pastes on the skin. **Aim.** To select the composition of active substances and excipients for creating a powder with the sorbing, analgesic and antimicrobial activity based on natural zeolite. **Materials & methods.** The study objects were model powder compositions containing a filler (natural zeolite), anesthetic (pyromecain), antifriction substances (talc, magnesium oxide, silicon dioxide) and antimicrobial substances (neomycin sulfate and polymyxin B sulfate). The quality of the samples was assessed by indicators of bulk and tapped densities, flowability, the Hausner ratio (H) and the Carr index (C). The osmotic activity was assessed by dialysis through a semipermeable membrane. For performing the tests the methods of the State Pharmacopoeia of Ukraine (SPhU) were used. **Results & discussion.** Powders with 5 % pyromecain showed the most optimal properties by the time of the start and duration of anesthesia; however, a further increase in its concentration did not give a significant effect. The technological properties of powders depend on both the type and concentration of antifriction substances. The addition of talc and magnesium oxide increased the density of powders by 2-18 %, and silicon dioxide reduced the density by 31-47 %. The flowability (100 g/s) of samples with talc was 48.4-69.4, with magnesium oxide – 65.7-72.2, and with silicon dioxide – 19.8-40.6. The most significant improvement in flowability occurred after adding silicon dioxide; therefore, this substance in the amount of 5 % was chosen for further research. The adsorption properties of the powder were characterized as moderate. The osmotic activity was 73 %. **Conclusions.** The studies on selection of active substances and excipients for creating a powder with the sorbing, analgesic and antimicrobial action based on natural zeolite have been conducted. The following composition of the medicinal product has been proposed: natural zeolite (clinoptilolite) – up to 25.0 g, neomycin sulfate – 5000 IU/g, polymyxin B sulfate – 10.000 IU/g, pyromecain – 1.25 g (5 %) and silicon dioxide – 1.25 g (5 %).
Keywords: natural zeolite; powder; excipients; pyromecain; osmotic activity

RESEARCHES ON PHARMACEUTICAL DEVELOPMENT OF SOLID GELATINE CAPSULES WITH DRIED MULTIPLE COMPONENT EXTRACT OF ANTIPHLOGOGENIC, DIURETIC AND CHOLERETIC ACTION 39-43

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Introduction. Pharmaceutical drug development is based on the selection and study of the drug-comparison, safety and efficacy, taking into account the route of administration, the dosage form, the substantiation of the composition and concentration of the active pharmaceutical ingredient (API) and the excipients, bioavailability, strength and stability; identifying potential critical quality indicators; the choice and proposals of optimal technological scheme for obtaining this drug, the definition of critical operations and parameters of the technological process; definition of strategy of control, development of specifications and methods of control of raw materials, intermediate, non-prepackaged and finished products; the choice of packaging; validation or verification of methods of quality control of a medicinal product; carrying out studies on the stability of the medicinal product during the predicted shelf life. One of the components of the delivery of the API to the site of the pathology is the dosage form of the drug, which significantly influences the preservation of its effectiveness, determining the degree of absorption and concentration in biological fluids. Recently, the attention of developers attracts a dosage form of capsule, which among the dosage forms of industrial production occupies the third place after tablets and solutions in ampoules. They have more advantages (accuracy of dosing, high bioavailability, stability and productivity of obtaining, corrective ability, minimization of production errors, aesthetics, the ability to provide medicinal products with planned properties: the ability to dissolve in certain parts of the gastrointestinal tract, possess prolonged release of the API), sparing technological mode, etc.). The aim of our work was to develop the technology of medicinal product in the form of capsules with an active pharmaceutical ingredient - a dry extract of urocholum, possessing anti-inflammatory, diuretic and choleretic properties, as well as to determine the critical parameters in their production. **Material&methods.** Pharmaco-technological research methods were applied. **Results&discussion.** The technological process of production of capsules with a

multi-component dry extract consists of the following stages: sifting of raw materials, preparation of mass for encapsulation (mixing of components, rubbing); encapsulation; packing of capsules into blisters; packing blister packs; packing bundles in boxes. On 3 experimental industrial series (0040319, 0050319, 0060319), it was validated by the technological process of producing urocholum capsules and proved its reproduction in industrial conditions. With the help of the Ishikawa diagram, the most significant aspects that influence the technological process and which need to be controlled at the routine production of capsules of urocholum were identified. The design of a technological regulation for the production of gelatinous capsules with a multi-component dry extract possessing anti-inflammatory, bile and diuretic properties was developed and tested in industrial conditions of the LLC DKP "Pharmaceutical Factory", Zhytomyr. **Conclusion.** 1. Based on the complex of scientific and experimental researches, the optimum technological mode of production of hard gelatinous capsules with a multi-component dry extract with anti-inflammatory, choleretic and diuretic activity was established. 2. The critical stages of the process of gelatinous capsules being developed and the parameters of their control and the criteria of acceptability according to the requirements of the SPHU were determined. 3. Technology has been tested in the conditions of industrial production of LLC DKP "Pharmaceutical Factory", Zhytomyr, in accordance with the project of the technological regulations for the production of gelatin capsules with a multi-component dry extract.

Keywords: pharmaceutical development, solid gelatine capsules, multi-component extract.

MODERN PHARMACOTHERAPY OF CHRONIC HEPATITIS C DEPENDING ON THE GENOTYPE OF THE HEPATITIS C VIRUS 44-47

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Hepatitis C is an infectious disease of the liver caused by the hepatitis C virus (HCV), which affects the liver and causes inflammation. This virus can cause both acute and chronic course of hepatitis in (70-80% of patients), which can vary according to the severity of the disease. The World Health Organization (WHO) estimates that about 71 million people worldwide suffer from chronic hepatitis C. According to estimates by national experts, Ukraine is among the countries with an average prevalence of hepatitis C. Every year, about 6,000 people are diagnosed with hepatitis C. There are 24,786 patients on the waiting list for treatment in Ukraine. Injecting drug users (IDUs) are most at risk of contracting HCV. The highest rate of HCV transmission is found in men who have sex with men. HCV can also be transmitted through tattoos, razors and acupuncture. Transmission of HCV from mother to fetus can be observed in about 4-5% of cases. Breastfeeding is safe. HCV is a spherical, enveloped, single-stranded RNA virus belonging to the Flaviviridae family. A genomic analysis of HCV led to the division of the hepatitis C virus into six genotypes. Subtype analysis was also righteous, which improved the genomic classification of HCV. HCV subtypes pose a serious problem for immune-mediated control of HCV and can explain the diverse clinical course of the disease and the difficulties in vaccine development. The article analyses the recommendations of the American Society of Infectious Diseases (IDSA) and the American Association for the Study of Liver Diseases (AASLD), in collaboration with the US International Antiviral Society (IAS-USA) on the pharmacotherapy of chronic viral hepatitis C. The pharmacotherapy of chronic HCV has two goals: 1. Achieving sustained HCV eradication or sustained virological response (SVR) – no serum HCV RNA 12 weeks after the completion of antiviral treatment. 2. Prevent the progression of cirrhosis, hepatocellular carcinoma, and decompensated liver disease requiring liver transplantation. To date, pharmacotherapy of chronic viral hepatitis C uses a combination of pegylated interferon (PEG-IFN) with ribavirin and direct-acting antiviral drugs (DAD). At the same time, very recently, priorities have been removed from the AASLD/ISDA recommendations and today treatment is strongly recommended for all patients with chronic viral hepatitis C. The addition of the oral nucleoside analogue of ribavirin to the PEG-IFN pharmacotherapy regimen marked a new era in the treatment of chronic HCV. The use of such a combination led to sustained eradication of HCV in 30-40% of cases. Pharmacotherapy with PEG-IFN alpha-2a and ribavirin can be individualized by genotype. Patients with HCV genotype 1 require treatment for 48 weeks and a standard dose of ribavirin. Patients with a genotype of 2 or 3 HCV genotypes adequately receive a low dose of ribavirin for 24 weeks. Relatively recently, a number of DADs were developed for specific effects on various replication sites of the hepatitis C virus. These include: protease inhibitors NS3 / 4A (boceprevir, voxilaprevir, telaprevir, simeprevir, grazoprevir, glecaprevir); NS5B protease inhibitors (sofosbuvir, dasabuvir); protease inhibitors NS5A (ledipasvir, daclatasvir, ombitasvir, elbasvir, velpatasvir, pibrentasvir). To date, according to the WHO recommendations, for the treatment of chronic viral hepatitis C, depending on the HCV genotype, in patients over 18 years old who have not received treatment, fixed combinations of DAD are used at the daily dosage. DAD for interrupting HCV replication in various places in different combinations showed 90-95% registered SVR compared to 50-70% in patients treated with PEG-IFN combined with ribavirin. However, clinicians should be aware that amino acid substitutions in the viral protein, associated with resistance to inhibitors and leading to drug resistance, can worsen the response to treatment of DAD, in particular, the base NS5A resistance in patients with chronic viral hepatitis C.

Keywords. Hepatitis C, chronic, treatment, protocols, genotypic of virus dependence