ABSTRACT&REFERENCES

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DEVELOPMENT OF METHOD FOR QUANTITATIVE ANALYSIS OF CORN SILK FOR INCLUSION IN THE DRAFT NATIONAL MONOGRAPH OF THE STATE PHARMACOPOEIA OF UKRAINE

p. 4–7

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According to the concept of the development and implementation of monographs on herbal material to the State Pharmacopoeia of Ukraine, Corn silk is included into the list of herbal material which is described in the State Pharmacopoeia of the USSR of the XI edition and is absent in the European Pharmacopoeia; therefore, the development of a national monograph on this herb is relevant. Previously it was reported that there are no methods for quantitative determination of biologically active compounds of the given herb in the State Pharmacopoeia of the USSR of the XI edition.

Aim. *Development of the methods for quantitative determination of flavonoids in Corn silk by absorption spectroscopy, harmonized with the State Pharmacopoeia of Ukraine requirements for herbal material to be implemented into the draft national monograph "Corn silk".*

Methods. *Unified methods for analysis of flavonoids by absorption spectroscopy were used.*

Results. *Concerning chemical composition, medicinal use and approaches to standardization, flavonoids were selected for identification by spectrophotometry method. Results of the quantitative determination of flavonoids in 7 samples of Corn silk using absorption spectroscopy method are displayed.*

Conclusion. *The necessity of improvement of the existing normative documentation on Corn silk that would meet modern requirements and harmonized with the European Pharmacopoeia was substantiated. In result of the study, it was suggested to implement the method for quantitative determination of flavonoids, calculated as luteolin, with regulation of not less than 0.6 %, into the State Pharmacopoeia of Ukraine national monograph "Corn silk"*

Keywords: *standardization, the State Pharmacopoeia of Ukraine, Corn silk, flavonoids*

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SCIENTIFIC SUBSTANTIATION OF THE MODEL OF THE DRUGS' RECOMMENDED LIST DEVELOPMENT FOR PHARMACOTHERAPY OF ACUTE BRONCHITIS IN CHILDREN OF EARLY AGE

p. 8–14

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Ensuring of the implementation of health sector social standards, in particular, in the aspect of pharmaceutical maintenance of decreed categories of people with free medicines within the regulated list is an important direction of the state policy realization of every country.

Aim. *Development of the method for the formation of the recommended list of the basic remedies for early age children and its processing on the model of pharmacotherapy of acute bronchitis.*

Methods. *System and analytical methods, as well as multi objective optimization problems solution and hierarchy analysis methods were used for the study.*

Results. *On the basis of systematization of the obtained results of regulatory, marketing and pharmacoeconomic study of medicinal products, the model of formation of the Recommended basic and additional lists of remedies applied for acute simple bronchitis pharmacotherapy in early age children, consisting of seven successive stages, was substantiated and developed. According to the offered model, the Recommended list of the most effective and economically affordable remedies included 24 trade names, including 13 antibacterial, 1 antiviral, 2 immunomodulatory and 8 mucolytic drugs. The share of the national remedies in this list was 20.8 %.*

Conclusion. *The offered Recommended list of the remedies will help to form local formulary and insurance drug list for pharmacotherapy in early age children under conditions of outpatient and clinic health facilities. At the same time, the given List is a basis for prediction of the future needs for necessary medicines and their cost reimbursement calculation for children under 3 years with acute simple bronchitis, which will help to save budget funds*

Keywords: *pharmaceutical maintenance, insurance list, children, acute bronchitis, remedies cost reimbursement*

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DEVELOPMENT AND VALIDATION OF THE SPECTROPHOTOMETRIC QUANTITATIVE DETERMINATION METHOD OF PREDNISOLONE IN AN OINTMENT WITH HYDROPHILIC BASIS

p. 15–20

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*The **aim** of research is to develop of the spectrophotometric quantitative determination method of prednisolone in an ointment with hydrophilic basis by a standard method and to study validation characteristics for further implementation in the laboratory for quality control of drugs.*

***Materials and methods.** The pharmacopoeial standard sample of prednisolone PSS State Pharmacopoeia of Ukraine (SPhU) No. 11/1-2143 (the content of prednisolone is 99,8 %) and hydrophilic ointment with active substance prednisolone ointment were used. The following research methods were used in the work: spectrophotometry by the standard method, methods of statistical processing of chemical experiment data. Analytical equipment, reagents, measuring glassware of class A meeting the requirements of the SPhU were used for the work.*

***Results**. The extraction method of prednisolone from an ointment with a hydrophilic base was developed: a filter («Blue Ribbon «) was selected and the necessary extraction conditions were determined. It was found that the procedure for extracting prednisolone from the base must be repeated three times – then the concentration is 99,62 % of the nominal concentration. Optimal conditions of spectrophotometry were determined: the concentration of the analytical solution of prednisolone 2×10^{-5} g/ml, wavelength 244 nm. The validation characteristics of the developed method were studied: stability of the analytical solution, linearity, accuracy, convergence.*

***Conclusions.** The development of the spectrophotometric quantitative determination method of prednisolone in an ointment with a hydrophilic base by the standard method has been carried out. The assessment of validation characteristics of the method allows us to conclude that the method is acceptable for use in laboratories for quality control of drugs and can be introduced to determine prednisolone in ointments with a hydrophilic base*

***Keywords:** quantitative analysis, spectrophotometric method, validation, prednisolone, ointment with hydrophilic base*

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DETERMINATION OF THE STABILITY OF VETERINARY CREAM CONTAINING SILVER CITRATE

p. 21–26

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An innovative activity in the field of development of new Ukrainian medicines for veterinary pharmacy remains relevant. The problem of treatment and prevention of mastitis in cows in Ukraine is not resolved. Almost all anti-mastitis drugs available on the market are antibiotics, which exacerbates the existing problem of antibiotic resistance, the solution of which is possible due to the development of new veterinary drugs with minimal side effects and maximum therapeutic efficacy.

Aim. *The aim of the research was to study the stability of the silver citrate containing veterinary drug consisting of the soft dosage form with antimicrobial activity codenamed "Argocid K".*

Methods. *Pharmaco-technological, physico-chemical, and microbiological methods of research were carried out in accordance with the requirements of the State Pharmacopoeia of Ukraine.*

Results. *The study of the stability of samples of cream "Argocid K" was carried out on five series of remedies, packed in aluminium tubes with internal lacquer coating and orange glass jars every 6 months within 27 months. Shelf life of the cream was determined at two temperature regimes - under room conditions (15–25) °C and in a cool place at (8–15) °C. In result of the study it was determined that all series of samples of the veterinary cream "Argocid K" satisfy requirements of the tests concerning thermal and colloidal stability. The quantitative content of the ions of the silver was determined using thiocyanometric titration method. The quantitative determination of dexpanthenol was carried out by liquid chromatography. The obtained data point to the stability of the drug.*

Microbiological studies have shown that the degree of microbial contamination of the drug meets the requirements of the State Pharmacopoeia of Ukraine for topical preparations. Silver citrate, which is included into the cream, shows a preservative effect in the studied concentration.

Conclusion. *The shelf life of the cream, in particular, 2 years and 3 months was determined. The results show the opportunity to predict the shelf life of the drug within two years and 3 months at a temperature of 8–25 °C and may be taken into account during development of the Draft of quality control methods for the cream "Argocid K" for its use in veterinary medicine*

Keywords*: veterinary drug, cream for cows milking udders care, silver citrate, stability*

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THE ANALYSIS OF LEGAL REGULATION OF PALLIATIVE CARE IN UKRAINE

p. 27–31

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*The **aim** of the study, resulting in the article, was to analyze the current state of legal regulation of palliative care in Ukraine.*
*The scientific analysis **methods**, in particular, system analytical, content analysis, methods of generalization and grouping, were used in the present research.*
***Results.** The analyzed current WHO regulations during the research, allowed defining the strategic directions of development of palliative and hospice care at both national and international levels. Positive aspects of the current national legislation concerning palliative care were formulated. They include the definition of palliative care as a separate type of care, legislative confirmation of the terms "palliative care", "palliative treatment", "palliative patient", the use of a multidisciplinary approach to provide palliative care to HIV patients, implementation to the eighth issue of the State Drug Formulary (Appendix 8), and remedies for palliative and hospice care.*
The shortcomings of legislative acts regulating palliative care in Ukraine, in particular regulatory norms fragmentation, the absence of nosologies list for palliative care, in accordance with approved protocols of treatment, methods for calculating the need for medicines, the register of palliative patients, etc., were determined. The priority measures to improve the national legislation in the aspect of palliative care in Ukraine for the organizational, medical and pharmaceutical, social and pharmaceutical, as well as educational directions were offered.
***Conclusion.** The prior purpose concerning the implementation of an effective model of palliative care in Ukraine is to form an adequate legal and regulatory framework, considering the multidisciplinary approach, WHO recommendations and the experience of the leading countries of the world. The "profile" law adoption with a clear definition of palliative care classification, medical, pharmaceutical, and social components of palliative care, sources, mechanisms and the amount of its financing is the basis of the mentioned changes*
***Keywords:** palliative care, social and pharmaceutical component, legal regulation*

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THE INFLUENCE OF THE COMPOSITION OF LIPOSOMES ON THE ENCAPSULATION EFFICIENCY AND THE PARTICLE SIZE WHEN CREATING THE LIPOSOMAL FORM OF CYTOCHROME C

p. 32–36

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The influence of the liposomes' composition on the encapsulation degree and particle size in the pharmaceutical formulation of the liposomal form of Cytochrome C is studied.

Aim: *research of the effect of the composition of liposomes on the encapsulation efficiency and particle size when creating the liposomal form of Cytochrome C, as an agent for ophthalmic diseases therapy.*

Methods. *Liposomal form of Cytochrome C is obtained by high pressure homogenization. Encapsulation of Cytochrome C was carried out using chemical bonding method, based on the possibility of formation of chemical bond between the liposome bilayer components and the active pharmaceutical ingredient. To determine the encapsulation efficiency, HPLC method based on the gel filtration was developed. The determination was carried out using Shimadzu (Japan) chromatograph.*

Results. *The composition of liposome membrane that allows to obtain nanoparticles with high encapsulation degree of Cytochrome C – up to 95.88 % and particle size in the range up to 150 nm – was determined.*

Conclusion: *The optimal composition of the liposome membrane containing Dipalmitoylphosphatidylglycerol and Phosphatidylcholine was studied for the further study of the given liposomal complex as a therapeutic remedy in ophthalmology.*

It has been found that the optimal composition of liposomes is the ratio of Phosphatidylcholine and Dipalmitoylphosphatidylglycerol (1.2–4.0:1), ensuring the maximum encapsulation of Cytochrome C in liposomes.

Methods for determination of encapsulation degree of Cytochrome C were developed. Cytochrome C encapsulation was more than 95.0 %

Keywords: *Cytochrome C, phospholipids, liposomes, homogenization, encapsulation degree, particle size*

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NORMATIVE SUBSTANTIATION OF PRODUCTION, QUALITY CONTROL AND SAFETY OF MEDICINAL PRODUCTS ON THE BASIS OF NANOMATERIALS

p. 36–40

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Aim. *The analysis of Ukrainian normative documents concerning remedies based on nanomaterials and the study of international experience on their development, quality control and safety.*

Methods. *Methods of information retrieval and literature data analysis have been used.*

Results. *The analysis of the State Pharmacopoeia of Ukraine, the orders of the Ministry of Health of Ukraine and other Ukrainian normative documents concerning medicines based on nanomaterials, as well as the EU legal framework on nanotechnologies and nanomaterials has been conducted. The necessity of development and approval in Ukraine of the regulatory and legal framework for medicines based on nanomaterials has been substantiated.*

Conclusion. *The question of expediency of working out the normative and legal base for creation of medicines on the basis of nanomaterials in Ukraine is uncontested. The first steps in this direction have already been taken, but the question is still far from the solution. The lack of regulatory requirements for production, quality control and safety of medicines with nanomaterials complicates their development and makes it impossible to introduce into production*

Keywords: *nanomaterials, nanotechnologies, medicinal preparations, normative documents, quality control, safety, standards*

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THE USE OF HPLC METHOD FOR ANALYSIS OF PRAZOSIN HYDROCHLORIDE SUITABLE FOR A CHEMICAL-TOXICOLOGICAL INVESTIGATION

p. 41–46

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Aim of research *is the identification and quantification of prazosin hydrochloride according to the unified HPLC method that based on application: reverse-phase chromatography, linear gradient and multichannel UV-detecting substances. The method allows obtaining reliable results of studies of drugs and mixtures in biological objects.*

Materials and methods. *HPLC chromatography was performed on microcolumn liquid chromatograph "Milichrome A-02" ("EcoNova" Novosibirsk, Russia) in reverse-phase variant. In this work the reagents of the qualification "for HPLC" and "PFA" were used. Prazosin hydrochloride was isolated from tablets Prazosin-Ratiofarm (50 pcs.) of 1 mg (Merkel GmbH & Co., Germany). Purity of the substance was checked by TLC and UV spectroscopy and the quality complies with the requirements of the SPhU.*

Results of the research. *During identification, absolute retention time (15.99–16.12 min) and retention volume (1598.5–1611.5 μl) of prazosin hydrochloride spectral relations, detection limit of medicine in the sample (8.0 μg / ml or 32.0 ng of sample), values of coefficients peak symmetry (0.96–1.04) and coefficients of capacity ratio (9.44–9.96) were determined.*

The regression coefficients of calibration curve were calculated by the method of least squares with the equation of the line S=0.00134 C. Correlation coefficient equaled 0.9993. Validation characteristics of HPLC-method for determination of prazosin hydrochloride: linearity range (10.0–200.0 μg / ml), limit of quantitative determination (10.0 μg/ml or 40 ng of sample), correctness and accuracy, which based on the quantitative determination results of the preparation by HPLC method in the model solutions (RSD $\bar{x}$=67.9 %) were calculated. It is established that the relative uncertainty of the average result was not exceeded ±1.89 % when using the proposed method of HPLC analysis of prazosin hydrochloride in model solutions.

Conclusion. *Identification and quantification of prazosin hydrochloride was carried out using a unified HPLC method suitable for a chemical toxicological study*

Keywords: *prazosin hydrochloride, identification, quantitative determination, HPLC (high performance liquid chromatography)*

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DEVELOPMENT AND STANDARDIZATION OF TEST SYSTEMS BASED ON FILTER PAPER AND MODIFIED WITH VANILLIN REAGENT

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Reagents and analytical tools for rapid analysis should be standardized and lead to the requirements of the State Pharmacopoeia of Ukraine. Newsprint paper is used as the main analytical tool for rapid analysis of substances with primary aromatic amino group, but it can't be standardized. The development of test systems based on filter paper and modified with pharmacopeia reagents can be the problem solution.

Aim. *The aim of the work is development and implementation of test-kits based on filter paper for rapid analysis of compounded preparations that contain primary aromatic amino group in conditions of pharmacies.*

Methods. *Methods of physical immobilization; determination of physical stability of test kits; economic and statistical methods (cost calculation); validation of analytical methods; statistical methods of data processing chemical experiment.*

Results. *Filter paper and pharmacopeia solution of vanillin were used to develop test systems; the possibility of using the test system in practice was investigated with the application of rapid analysis of sulfacetamide and sulfathiazole sodium. The possibility of using of the test system for rapid analysis of 5% aqueous solutions of derivatives of sulfanilic acid amides has been proved; the following detection limits and unreliability intervals for the rapid analysis method using test systems were established: 5.0–9.0 mg/ml for sodium sulfacetamide and 5.3–9.6 mg/ml for sodium sulfathiazole. The test system is stable during 5 months of storage. Manufacturing cost of 1 test system is 0.34 and 0.16 UAH for the first and the next batches, respectively.*

Conclusions. *The proposed test system is stable and accessible for usage in pharmacy as an analytical tool for rapid analysis of derivatives of sulfanilic acid amides*

Keywords: *extemporaneous preparations, chemical test-kits, rapid analysis, lignin test, sulfacetamide sodium, sulfathiazole sodium*

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