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Содержание

1. Абдуллаева Г.Ж., Раджабова Г.М., Закирова Д.В., Шербадалова Н.Х., Машкурова З.Т. Ассоциация rs6817105 полиморфизма гена PITX2 с фибрилляцией предсердий у больных артериальной гипертензией в узбекской популяции	8-15
2. Абдуллаева Г.Ж., Юсупова Х.Ф., Хамидуллаева Г.А., Машарипов Ш.М., Ибрагимова И.А. Взаимосвязь параметров суточного профиля артериального давления и артериальной жесткости с когнитивными нарушениями у больных артериальной гипертензией	16-23
3. Абдурахимова Л.А., Саидова М.Ж., Рахимова М.Б. Сурункали панкреатит ривожланишида турмуш тарзи ҳамда фенотипик хусусиятларнинг ўзига ҳос томонлари	24-32
4. Абдурахимова Л.А. Клиник фанларни ўқитишда симуляцион таълим жараёнининг ўзига ҳос томонлари	33-44
5. Абдурахимова Л.А., Халметова Ф.И. Сурункали панкреатитда ташқи секретор этишмовчиликнинг ташхислаш мезонлари	45-53
6. Абдурахманова Н.М., Рахимов С.С., Акрамов Н.М., Абдураззоқова Р.А. Генетические аспекты резистентности к лечению метотрексатом у больных ревматоидным артритом	54-59
7. Абдурахманова Н.М., Рихсиева Л.М. Оценка взаимосвязи уровня интерлейкина-17а с повреждением позвоночника у больных аксиальным спондилоартритом	60-68
8. Азимова О.Т., Халимова З.Ю. Клинико-гормональная характеристика агрессивных аденом гипофиза	69-74
9. Арипова Н.Н., Хамраев А.А., Собирова Г.Н. Математическая модель прогноза эффективности лечения больных с хроническими панкреатитами с экзокринной недостаточностью поджелудочной железы и дефицитом витамина Д	75-79
10. Атахажаева Г., Газиева Х., Мирзаева Б. Vemorlarning ijtimoiy holatiga qarab osteoartrit kechishida komorbid holatining xususiyatlari	80-87
11. Ахмедов И. А. Ревматоид артрит касаллигида бўғим ва бронхопуймонал ўзгаришларни эрта аниқлашда нурли диагностика текширув усулларнинг имкониятлари	88-91
12. Ахмедов Х. С., Ботирбеков А.Н. Modern views in the treatment of systemic sclerosis	92-95
13. Ахмедов Х. С., Халметова Ф.И. The significance of biomarkers in joint damage in patients with reactive arthritis	96-104
14. Ахмедов Х.С., Умарова Г.Ф. Динамика суставного синдрома при ревматоидном артрите на фоне коррекции прогестероновой недостаточности	105-109
15. Ахмедов Х.С., Умарова Г.Ф., Кенжаев А.Б. Сравнительная характеристика клинических и функциональных показателей при ревматоидном артрите в зависимости от зон проживания	110-114
16. Ахмедов Х.С., Халметова Ф.И.	

Суставной синдром у больных с реактивным артритом: ретроспективный анализ	115-118
17. Ахмедов Х.С., Мамирова М.Н.	
II Тип қанди диабетда нефропатия ривожланиши клиник ва лаборатор маркерларининг солиштирма таҳлили	119-124
18. Бобокулов М.Б., Сабиров М.А., Зуннунов Х.М.	
Morpho-functional state of the transplant kidney in metabolic syndrome and dyslipidemia	125-132
20. Буранова С. Н.	
Изучение клинической эффективности препарата «Суставин» на фоне стандартной терапии остеоартрита коленных суставов	133-138
21. Буранова С. Н.	
Study of the clinical course of articular syndrome and retrospective assessment of disorders of articular structures in patients with osteoarthritis	139-145
22. Валиева М.Ю., Салахиддинов З.С.	
Сравнительная оценка выявляемости предгипертензии и артериальной гипертензии в зависимости от основных факторов риска в условиях ферганской долины	146-152
23. Гадаев А.Г., Гулямова Ш.С.	
Внедрение инновационной технологии наблюдения больных гипертонической болезнью в условиях семейной поликлиники	153-161
24. Гадаев А.Г., Пирматова Н.В., Рахматуллаева Н.Р.	
Состояние функции почек у больных с хронической сердечной недостаточностью, перенесших Ковид-19 в динамике проводимой терапии	162-168
25. Гадаев А.Г., Салаева М.С., Сагдуллаева Ю.А.	
Дисфункция почек при хронической обструктивной болезни лёгких	169-177
26. Жўраева М.А., Холикова Д.С.	
Юик билан хасталанганларда ичак микробиотасини ўзгаришини дислипидемияга таъсири	178-182
27. Закирходжаев Ш.Я., Паттахова М.Х., Муталов С.Б.	
Изучение особенностей гуморальных факторов у пациентов с хроническими заболеваниями печени	183-192
28. Зарипов С.И.	
Pathophysiological and clinical significance of anti-nuclear antibodies in systemic sclerosis	193-198
29. Исиргапова С. Н., Сабиров М. А., Султонов Н. Н.	
Климактерик синдромни сурункали буйрак касаллиги в боскичидаги беморларда касаллик кечишига таъсир хусусиятлари	199-206
30. Камилова У.К., Кодирова Ш.С.	
Изучение психологических нарушений у больных, перенесших COVID -19	207-211
31. Қурбонов А.К., Раҳимов А.Н.	
Сурункали юрак етишмовчининг метаболик синдром билан коморбидликда кечишини ўзига хослиги	212-224
32. Қурбонов А.К., Саттаров С.Т., Эрназаров М.М.	
Сурункали юрак етишмовчилиги ва юрак-қон томир хавфи: гиперурикемия ...	225-232
33. Қурбонов А.К., Худаяров А.А., Эрназаров М.М., Раззаков И.О., Саттаров С.Т.	
Сурункали юрак етишмовчилигининг гемодинамик фенотипларини шаклланиши ва кечишида айрим нейрогормонларнинг аҳамияти	233-241
34. Мирахмедова Х.Т., Хамраев Х.Х., Дадабаева Н.А.	

Диагностика и лечение волчаночного нефрита	242-248
35. Mekhmonov Sh.R., Babakulov Sh.Kh., Boltaev Sh,Sh.	
O'sima etiologiyli obstruktiv yo'g'on ichak tutilishining diagnostikasi va davolashi	249-253
36. Нагаева Г.А., Ли В.Н., Журалиев М.Ж.	
Функциональное состояние почек во взаимосвязи с клинико-анамнестическими данными у больных ОКС/ОИМ	254-260
37. Нуриллаева Н.М., Ибраимова Т.Х.	
Динамика факторов риска ишемической болезни сердца и их изменчивость при информированности пациента	261-266
38. Пулатова Н.И.	
Clinical efficacy and tolerance of oregano extract as an expectorant in respiratory pathology treatment	267-272
39. Рахимов Х.Х., Камилова У.К..	
Қандли диабет 2 тур беморларида миокард инфарктидан кейинги юрак-қон томир ремоделлашуви хусусиятлари	273-277
40. Рахимова М.Б., Ахмедов Х.С.	
Современные аспекты терапевтического подхода анкилозирующего спондилоартрита	278-286
41. Рахимова М.Э., Ахмедов Х.С.	
Стабил зўриқиш стенокардияси билан оғриган беморларда буйраклар дисфункциясини эрта ташхислаш ва даволашни мувофиқлаштириш	287-296
42. Рахимова М.Э., Гадаев А.Г.	
Юрак ишемик касаллигида буйраклар дисфункциясини эрта аниқлашда подоцитлар холати ва подоцитуриянинг аҳамияти	297-304
43. Розыходжаева Г.А., Юсупалиева Г.А., Назирхужаев Н.Ш.	
Актуальность разработки референтных параметров количественной эхокардиографии у здоровых детей узбекской популяции (обзор)	305-310
44. Сабиров М. А., Ташпулатова М. Х., Мунавваров Б. А.	
Антиоксидантларнинг коронавирус ассоцирланган нефропатиялардаги самарадорлигини цитокинлар динамикасидаги манзараси	311-318
45. Садикова С.И., Джалилова С.Х.	
Современные принципы терапии лямблиоза кишечника в практике семейного врача	319-324
46. Саидхонов С. М., Сабиров М. А., Даминова К.М., Мунавваров Б. А.	
Сурункали буйрак касаллигининг турли босқичларида дисэлектролитемия ва гипергомоцистеинемиянинг лаборатор манзараси	325-330
47. Сафарова Г.А.	
The problem of nephropathy in patients after coronavirus infection (literature review)	331-339
48. Тошева Х.Б.	
Surunkali obstruktiv o'pka kasalligini tashxislash va davolashga yondashuv	340-347
49. Тураев И.А.	
Эффективность антигипертензивной терапии у больных ХБП III стадии	348-253
50. Турсунов Д.И., Муминов Д.К., Даминова Л.Т.	
Состояние почек при хронической обструктивной болезни легких	354-358
51. Турсунова Л.Д., Жаббаров О.О.	
An approach to the treatment of cardiorenal syndrome in patients with chronic kidney disease	359-368
53. Турсунова Н.С., Нугманова М.А.	

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CLINICAL EFFICACY AND TOLERANCE OF OREGANO EXTRACT AS AN EXPECTORANT IN RESPIRATORY PATHOLOGY TREATMENT

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Annotation

Using medicinal plants for therapy is current and relevant. An important area of mucolytic and expectorant therapy is the investigation of the effects of medication combinations that can affect a variety of mechanisms of inflammation and cough in a complete manner. The clinical effectiveness and tolerability of the expectorant medicine "Bronchovalin" (oregano extract), created in Uzbekistan, are discussed in this article.

Key words: treatment, chronic obstructive pulmonary disease, pneumonia

Хулоса

Ushbu maqola bronxopulmoner kasalliklar, shu jumladan surunkali obstruktiv o'pka kasalligi (SOO'K) va pnevmoniya bilan og'rigan bemorlarni davolashda oregano ekstraktidan olingan "Bronchovalin" o'simlik preparatining ekspektoran sifatida klinik samaradorligi va xavfsizligini o'rganadi. Tadqiqot "Bronchovalin" ning yo'talning intensivligi, balg'am xususiyatlari, biokimyoviy qon belgilari va bemorning bardoshlilikigi kabi asosiy klinik va laboratoriya ko'rsatkichlariga ta'sirini baholaydi. Tadqiqot nafas olish sharoitlarini boshqarishda ushbu o'simlik vositasining potentsial foydalari haqida tushuncha berish va nafas olish kasalliklarini muqobil davolash usullarini kengroq tushunishga hissa qo'shishga qaratilgan.

Kalit so'zlar: davolash, surunkali obstruktiv o'pka kasalligi, pnevmoniya

Резюме

В статье исследуется клиническая эффективность и безопасность растительного препарата «Бронховалин», полученного из экстракта тимьяна, в качестве отхаркивающего средства при лечении больных с бронхолегочными заболеваниями, в том числе с хронической обструктивной болезнью легких (ХОБЛ) и пневмонией. В исследовании оценивается влияние «Бронховалина» на основные клинико-лабораторные показатели, такие как интенсивность кашля, характеристики мокроты, биохимические маркеры крови и переносимость пациентами. Исследование направлено на то, чтобы дать представление о потенциальных преимуществах этого растительного лекарственного средства при лечении респираторных заболеваний и способствовать более широкому пониманию альтернативных методов лечения респираторных заболеваний.

Ключевые слова: лечение, хроническая обструктивная болезнь легких, пневмония

Diseases of the upper (acute respiratory infections, pharyngitis, laryngitis, tracheitis) and lower respiratory tract (bronchitis, pneumonia, chronic obstructive pulmonary disease, bronchial asthma) constitute a third of all outpatient visits to general practitioners [3]. Coughing is one of the most common reasons for seeking medical attention. In the United States, it is the most frequent complaint among patients and the second most common reason for medical examination.

Coughing is a protective mechanism aimed at removing foreign particles, microorganisms, or pathological bronchial secretions from the respiratory tract, thus clearing and restoring the patency of the airways. Coughing occurs when the receptors of the vagus nerve are irritated in reflexogenic zones located on the posterior surface of the pharynx, in the larynx, in the area of the vocal cords and subvocal space, at the bifurcation of the trachea, and at the sites of branching of the main bronchi, as well as on the pleura.

It is important to note that coughing can be both a symptom of respiratory tract diseases and a reaction to irritants in the environment. Coughing is often accompanied by various symptoms such as sore throat, difficulty breathing, elevated body temperature, and general weakness. Depending on its nature and duration, coughing can be dry or productive, acute or chronic.

For effective treatment of cough, it is necessary to identify its cause. Treatment approaches vary depending on the underlying condition. In the case of viral infections of the upper respiratory tract, such as acute respiratory infections, pharyngitis, and laryngitis, increased fluid intake, rest, the use of antipyretic and analgesic drugs are often recommended. More serious conditions, such as

pneumonia or chronic obstructive pulmonary disease, may require the prescription of antibiotics or bronchodilators.

Bronchial asthma can also cause a characteristic cough, accompanied by shortness of breath and wheezing in the chest. Asthma treatment includes the use of inhaled glucocorticosteroids, bronchodilators, and other drugs aimed at reducing inflammation and improving the patency of the airways.

In any case, if coughing persists or worsens, it is necessary to consult a doctor for an accurate diagnosis and prescription of appropriate treatment. Self-medication may not be effective enough and may delay the initiation of necessary therapy.

In response to damage by an infectious agent in the respiratory tract mucosa, an inflammatory reaction develops, accompanied by hypersecretion of mucus by goblet cells and submucosal glands. This leads to the hyperplasia of goblet cells. The main manifestation of these processes is the suppression of the ciliary epithelium's function. Additionally, the composition of bronchial secretions also changes. The transition of inflammation to a chronic form results in the morphological remodeling of the mucous membrane and epithelium [4].

Cough receptors are represented by two types of nerve endings: irritant receptors and C-fibers. Irritant receptors respond to external (mechanical, thermal, and chemical) irritants and are located in the proximal regions of the respiratory tract. Irritative factors include inflammatory factors (mucosal edema, pathological secretions), mechanical factors (foreign bodies, enlarged lymph nodes, and space-occupying lesions in the mediastinum), as well as chemical and thermal factors. C-receptors are primarily located in the distal

parts of the respiratory tract and are stimulated by various pro-inflammatory mediators (prostaglandins, bradykinins, substance P, etc.).

Stimulation of cough receptors leads to the transmission of nerve impulses to the cough center in the medulla oblongata. As a result of the excitation of the cough center, a reflex response is formed, which involves a deep inhalation followed by synchronous contraction of the muscles of the larynx, bronchi, chest, abdomen, and diaphragm, with the vocal cords initially closed and then rapidly opened, leading to a short, forced expiratory effort [1,2].

The treatment of cough should begin with addressing its underlying causes. It's important to remember that the treatment should not simply aim to suppress the cough. Herbal therapy is one of the oldest methods in medicine and remains relevant today. Despite the availability of highly effective synthetic drugs, herbal medicine continues to hold its ground. Through centuries of empirical selection, groups of medicinal plants have been identified for various pathologies. Unlike pharmaceutical drugs, medicinal plants contain multiple components, allowing a single plant to exert multifaceted effects on the body, such as expectorant, antimicrobial, anti-inflammatory, and diuretic effects.

Another interesting distinction between herbal preparations and synthetic counterparts is the possibility of simultaneous combined use of different medicinal plants. With proper selection of phyto-combinations, there can be a synergistic and enhanced therapeutic effect among the components in the mixture, while undesirable reactions can be smoothed out or eliminated. [6].

However, despite the widespread use of herbal preparations, many of them lack sufficient evidence regarding their

effectiveness and safety. Nevertheless, standardized herbal preparations created using modern technologies have the necessary level of safety. The possibility of their prolonged use without side effects while maintaining therapeutic effectiveness makes phytotherapy indispensable in treating various diseases [5].

Given the above, studying the effects of combined preparations capable of comprehensively affecting various mechanisms of inflammation and cough represents an important direction in mucolytic and expectorant therapy.

Research Objective: To investigate the clinical efficacy and tolerability of the "BRONCHOVALIN" preparation (thyme extract) 0.4 g tablets, developed at the Institute of Oriental Medicine in Uzbekistan, as an expectorant agent.

Materials and Methods of the Study: Patients of both genders aged 18 years and older, undergoing outpatient treatment at a multidisciplinary clinic of the TMA, with diagnoses of acute bronchitis, chronic obstructive pulmonary disease (COPD), and pneumonia, who provided written informed consent to participate in the study, were included. After screening, eligible patients were randomly divided into two groups (1:1 ratio). Patients in the main group (30 individuals) received "Bronchovalin" 0.4 g. The medication was taken orally as 1 tablet three times a day before meals. Patients in the comparison group (30 individuals) received "Mukaltin" 50 mg as 1 tablet three times a day before meals. The duration of treatment was determined individually based on indications and the course of the diseases. The average duration of the treatment course was 10 days.

The following diagnostic methods were performed on the patients:

Clinical examination: Observation of

the patient's overall condition, intensity of complaints (using a 3-point scale): cough (non-productive, slightly productive, productive), sputum (scanty, moderate, abundant), scored according to the following scale:

3 Score	High effectiveness	Complete disappearance of disease-related clinical complaints by the end of the treatment course with a total score of 0-5, significant improvement (above 86%) in laboratory parameters.
2 Score	Moderate effectiveness	Moderate reduction in clinical complaints corresponds to a total score of 6-10, and moderate improvement (70-85%) in laboratory parameters.
1 Score	Low effectiveness	Slight reduction in clinical complaints corresponds to a total score of 11-15, and slight improvement (less than 70-85%) in laboratory parameters.
0 Score	Lack of effectiveness	No changes or worsening of clinical and laboratory parameters by the end of the treatment course.

Клинические анализы: общий анализ крови, общий анализ мокроты.

Биохимические анализы: АлТ, АсТ и билирубин

Results of the study.

Analysis of the dynamics of cough, sputum, and peak flow measurements showed that in both groups, the indicators improved and approached normal values after treatment. In the main group, the peak flow rate before treatment was 471.5 ± 12.0 L/s, and after treatment, it was 475.7 ± 11.9

L/s. Similar data were obtained in the control group with peak flow rates of 465.3 ± 13.8 L/s before treatment and 469.0 ± 13.7 L/s after treatment.

Table 1 presents the results of the study of biochemical blood parameters in patients before and after treatment.

Table No. 1

Dynamics of Biochemical Blood Parameters in Patients

Indicators	ALT (U/L) before treatment	ALT (U/L) after treatment	AST (U/L) before treatment	AST (U/L) after treatment	Bilirubin ($\mu\text{mol/g}$) before treatment	Bilirubin ($\mu\text{mol/g}$) after treatment
Main Group	$26,4 \pm 1,6$	$23,6 \pm 0,8$	$25,4 \pm 0,8$	$23,0 \pm 0,9$	$13,9 \pm 0,5$	$14,4 \pm 0,6$
Control Group	$27,8 \pm 1,6$	$25,5 \pm 1,3$	$25,6 \pm 1,2$	$23,3 \pm 1,4$	$14,8 \pm 0,5$	$14,6 \pm 0,5$

The data from the biochemical analysis indicate that the measured parameters remained within the

permissible range. Patients from both groups tolerated the medications well.

The results of studying the main blood parameters are presented in Table 2.

Table No. 2

Dynamics of Main Blood Parameters in Patients

Indicators	Hb g/l (before)	Hb g/l (after)	Erythrocytes 10 ¹² /l (before)	Erythrocytes 10 ¹² /l (after)	Leukocyte 10 ⁹ /l (before)	Leukocyte 10 ⁹ /l (after)	ESR mm/h (before)	ESR mm/h (after)
Main Group	114,6±1,6	115,7±1,2	3,2±0,07	3,7±0,07	8,2±0,3	6,03±0,2	14,6±0,5	9,3±0,5
Control Group	114±1,8	114,5±1,6	3,9±0,07	3,6±0,07	9,5±0,3	6,7±0,3	17,5±0,7	9,7±0,6

In the blood tests conducted initially and during the course of treatment, the levels of hemoglobin and the count of erythrocytes in both groups remained within normal ranges. Additionally, the white blood cell count and erythrocyte sedimentation rate (ESR) slightly decreased compared to the values before treatment.

The dynamics of the main sputum indicators in the main group of patients showed that after treatment, the content of epithelial cells and leukocytes decreased compared to the values before treatment. Specifically, the epithelial cell count decreased from 17.2±1.7 to 7.9±0.7 cells per field of view, and the leukocyte count decreased from 13.3±0.9 to 5.9±0.6 cells per field of view. Similar results were obtained for patients in the control group. Epithelial cell count decreased from 20.6±1.8 to 10.1±0.9, and leukocytes decreased from 12.8±0.7 to 6.5±0.5 cells per field of view, respectively.

Based on the obtained results, it can be noted that the therapy conducted in both groups had no significant effect on blood

pressure and pulse indicators. The values of the biochemical analyses remained within acceptable norms. All patients tolerated the medication well. In terms of blood parameters, both hemoglobin levels and erythrocyte counts remained within normal ranges in both groups, both initially and throughout the treatment course. Additionally, leukocyte counts and erythrocyte sedimentation rate (ESR) slightly decreased compared to values before treatment. In terms of sputum parameters, both epithelial cell counts and leukocyte counts decreased during the treatment course in the Bronhovalin group compared to values before treatment. These findings align with our expectations for this medication.

In conclusion, the results of the study have demonstrated a positive clinical effectiveness and tolerability of the medication "Bronhovalin" (extract of thyme) as a mucolytic agent in the treatment of patients with bronchopulmonary pathologies, particularly in patients with chronic obstructive pulmonary disease (COPD) and pneumonia.

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