

**MODERN PRINCIPLES OF PHARMACOTHERAPY
OF CARDIOVASCULAR DISEASES ON THE BASIS
OF EVIDENCE-BASED MEDICINE**

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INTRODUCTION

Availability of standard treatment, especially life-threatening diseases, and greatly simplifying the actions of the doctor, reduces the emotional burden when making decisions. Subject to the standard, even in the event of an adverse outcome, the legal assessment of the actions of the doctor becomes more objective.

In accordance with the Order of MH of Ukraine of 28.09.2012 № 751 “On the development and implementation of medical and technological documents on medical care standardization in the system of the Ministry of health of Ukraine” unified clinical protocol of medical care is a document that is developed on the basis of clinical guidelines, including the health system, in the presence of standard medical care, according to it; defines the process of medical care, scope and its outcomes in certain disease and approved by the Ministry of health of Ukraine¹.

Currently in the health care system of Ukraine is an important event is to build a qualitatively new system of standardization of medical care on the basis of use of methods for developing clinical guidelines, medical standards, unified clinical protocols and local protocols of medical care on the principles of evidence-based medicine.

Unified clinical protocol of primary, secondary (specialized) and tertiary (highly specialized) medical care (UCPMC) “Stable ischemic heart disease”, developed taking into account modern requirements of evidence-based medicine, considers the peculiarities of diagnostics, treatment and prevention of stable coronary heart disease in Ukraine with a view to ensuring the continuity of medical care stages. UCPMC developed on the basis of the clinical setting “Stable ischemic heart disease. Updated and adapted the clinical setting evidence-based”. The approval of this UCPMC suspending the use UCPMC “Ischemic heart disease: stable angina. Primary care”, which was promulgated by the Order of MH Ukraine of 23.11.2011 № 816

¹ Статистика захворюваності населення станом на 01.12.2017 року на серцево-судинні захворювання / І. В. Саханда. *Фітотерапія. Часопис.* № 1. 2018. С. 56–58.

(with amendments and additions made by the order of Ministry of health of Ukraine “On approval and implementation of medical and technological documents on standardization of medical care on the principles of evidence-based medicine” on June 30, 2015 № 396)².

1. Regulatory and technical documentation on cardiovascular morbidity

In the development of the UCPMC, as well as the relevant clinical guidelines, new provisions of evidence-based medicine have been taken into account, which have been incorporated into the updated recommendations of the European Association of Cardiologists (2013). The term “Stable coronary artery disease” is used to define nosology in the original text, which is undoubtedly more accurate in terms of the pathogenetic nature of the disease. According to the WHO nomenclature, this term is synonymous with the term “Coronary heart disease (CHD)”. Taking into account the fact that in Ukraine the commonly recognized term is coronary heart disease, the term “Stable ischemic heart disease” is used in the name UCPMC.

In terms of form, structure and methodological approaches to the use of evidence-based medicine, the UCPMC meets the requirements of “Methods of development and implementation of medical standards (unified clinical protocols) of medical care on the basis of evidence-based medicine”, approved by the Order of the Ministry of Health of Ukraine on September 28, 2012 № 2001/22313³.

The UCPMC focuses on the organization of medical care for patients with stable coronary heart disease in Ukraine in accordance with international clinical guidelines:

1. 2013 ESC guidelines on the management of stable coronary artery disease;
2. 2012 ACCF / AHA / ACP / AATS / PCNA / SCAI / STS Guideline for Diagnosis and Management of Patients With Stable Ischemic Heart Disease;
3. 2011 NICE (National Clinical Guideline Center) guideline 126 Stable angina;
4. 2013 AHA Exercise Standards for Testing and Training: A Scientific Statement From the American Heart Association.

In the new version UCPMC discusses the provision of medical care of patients with cardiovascular diseases (CVD) not only at the stage of primary

² The use of medicinal plants the treatment of cardiovascular diseases / M.L. Syatynya, T.S. Nehoda, I.V. Sahanda. *Nauka i studia*. 2015. Przemysl. P. 38–42.

³ Assortment of herbal medicines of the treatment of cardiovascular diseases / K.L. Kosyachenko, I.V. Sakhanda. *Wiadomości Lekarskie*. LXXI (5). 2018. P. 1104–1108.

medical care, secondary (specialized) and tertiary (highly specialized) that provides a clear consistency in the delivery of health care. The aim of the Protocol is the introduction of health organization and diagnostic and treatment approaches that meet the provisions of evidence-based medicine, in the process of providing medical care to patients with stable coronary artery disease in Ukraine⁴.

May 24, 2012 Order of MH of Ukraine № 384 “On approval and implementation of medical and technological documents on standardization of medical care in arterial hypertension”, approved the unified clinical protocol of primary, emergency and secondary (specialized) medical care “Hypertension”, developed on the basis of appropriate clinical setting “Arterial hypertension” as a source of evidence-based information on best medical practice. Modern medicine provides for continuous improvement of interventions for the diagnosis, treatment and prevention of diseases subject to the requirements of evidence-based medicine. System of standardization of medical care is focused on the development of medical and technological documents which help the doctor to operate effectively in specific clinical situations, avoiding inefficient and wrong interventions⁵. Unified clinical protocol of medical care “Arterial hypertension” according to their form, structure and methodological approaches to using requirements of evidence-based medicine established by the order of MH of Ukraine № 798/75 from 03.11.2009 “On approval of the uniform methods for developing clinical guidelines, medical standards, unified clinical protocols of medical care, local protocols of medical care (clinical routes of patients) on the principles of evidence-based medicine (part two)”. UCPMC developed on the basis of the clinical setting “Hypertension. Updated and adapted the clinical setting evidence-based”⁶.

To eliminate neuropsychiatric disorders in pregnant women with AH, it is also advisable to use light sedatives of plant origin: drugs of valerian, dried flowers, canine nettle. Treatment of patients with AH with concomitant diabetes mellitus requires consideration of the individual risk of complications and the use of treatment-dependent treatment. It is proved that timely administration of drug therapy in patients with AH reduces the progression of the disease, the development of complications and mortality.

⁴ The main methods of treatment of cardiovascular diseases by medicinal plants / K.L. Kosyachenko, I.V. Sakhand. *Wiadomości Lekarskie*. LXXI (6). 2018. P. 1279–1283.

⁵ Дячук Д.Д., Мороз Г.З., Гідзинська І.М. та ін. Локальний протокол медичної допомоги хворим на артеріальну гіпертензію: досвід розробки та впровадження на амбулаторно-поліклінічному етапі. Київ : Інтерсервіс, 2015. 141 с.

⁶ Клінічний протокол профілактики серцево-судинних захворювань на первинній ланці [Текст]. *Український медичний часопис*. 2016. № 5. С. 91–96.

However, the unified clinical protocols does not specify the provision of medical care for herbal medicinal products. Even the information sheet for patients with AH does not indicate which AHs can be taken⁷.

Currently, there are two main approaches to the prevention and conservative treatment of cardiovascular diseases:

a) the traditional approach when the doctor diagnoses and prescribes pharmacological preparations in accordance with the practice described in current textbooks and treatment protocols;

b) unconventional approach involves not only the use of such tools as synthetic drugs, and herbs, trace elements, enzymes, but also involves the active participation of the patient in the healing process (changing the habitual lifestyle, including nutrition and rest, wellness exercises, etc.).

In order to reduce the prevalence of CVD, Presidential Decree № 117/99 of 04.02.1999 approved the “National Program for the Prevention and Treatment of Hypertension in Ukraine”, which operated during 1999–2010. The final results expected after the implementation of the program were: a) raising awareness of up to 90% of the population about the presence of hypertension; b) increase in the proportion of patients taking drugs that reduce blood pressure up to 70–75%; c) reduction of the incidence of cerebrovascular diseases in hypertension by 20–30%; d) reduction of mortality from stroke by 20–30%, from coronary heart disease – by 10%. Therefore, the tasks that were set for the implementation of the program were implemented, but the issue of cardiovascular morbidity was not resolved. Since 1999, 4 editions of the recommendations of the Ukrainian Association of Cardiologists for the Prevention and Treatment of Hypertension have been published (4th edition, corrected and supplemented, developed as a guide to the program)⁸. In 2009, the Cardiology Instruction, recommended by the Association of Cardiologists of Ukraine and the Academic Council of the National Scientific Center “Institute of Cardiology named Academician M.D. Strazhesko” of the National Academy of Medical Sciences of Ukraine for a wide range of specialists: cardiologists, rheumatologists, cardiac surgeons, resuscitators, therapists, therapeutists researchers, students of higher medical schools (V.M. Kovalenko (Ed.))⁹.

On April 1, 2017, the government’s Affordable Care Program began operating in Ukraine. Its purpose is to reduce mortality and the number of

⁷ Коваленко В.М. Сучасні пріоритети і результати розвитку кардіології в Україні. *Український кардіологічний журнал*. 2012. № 2 додатковий.

⁸ Концепція Державної програми профілактики і лікування артеріальної гіпертензії в Україні на 2011–2020 роки. *Артеріальна гіпертензія*. 2011. № 2 (16).

⁹ Концепція Загальнодержавної програми “Здорова нація на 2012–2016 рр.”.

complications from cardiovascular disease. It is the implementation of the reimbursement program (reimbursement) that gives Ukrainians the right to receive some medicines for free.

In late 2012, the process of standardization of medical care was officially launched in Ukraine, which is based on the creation of medical-technology documents (MTDs) based on evidence-based medicine based on world best practices. Compliance with the requirements of the MTD is mandatory for all practitioners, regardless of the institution in which they work, as well as entrepreneurs. Provided information on the necessary actions of general practitioners – family doctors, therapists, cardiologists in the provision of medical assistance for the prevention of cardiovascular diseases in accordance with the requirements of the order of the Ministry of Health of 13.06.2016 № 564 “On approval and introduction of medical-technological documents on standardization of medical care in the part of prevention of cardiovascular diseases”, prepared by a multidisciplinary working group, which included specialists in the specialties of “General practice – family medicine”, for technical support department of standardization of medical services “State Expert Center MH Ukraine”¹⁰.

Prevention of cardiovascular disease is a coordinated effort to eliminate or reduce the prevalence of CVD and related disability and premature mortality. Preventive measures recommended for clinical practice are based on the results of clinical and epidemiological studies on CVD and on the impact of prevention measures on morbidity and mortality conducted on the basis of evidence-based medicine. In clinical practice, prevention is divided into primary and secondary, although, because the occurrence of CVD is associated with the continuous development of atherosclerotic process, the differences between them are conditional – prevention measures are recommended throughout life, from birth (if not before) and until old age. The main measures for preventing CVD, in accordance with clinical guidelines (CG), are identifying risk factors (FR), conducting a general risk assessment of CVD and performing interventions aimed at reducing overall risk through the introduction of healthy lifestyle principles and correction of risk factors – medicines and non-drug¹¹.

Commonly recognized FRs of CVD are hypertension, lipid and glucose metabolism disorders, lifestyle factors such as smoking, unhealthy eating,

¹⁰ Корнацький В.М. Серцево-судинна захворюваність в Україні та рекомендації щодо покращення здоров'я в сучасних умовах. Аналітично-статистичний посібник. Київ, 2012. 117 с.

¹¹ Наказ МОЗ України “Про Програму профілактики і лікування артеріальної гіпертензії в Україні” № 117/99 від 04.02.1999 р.

poor physical activity, social factors, and personality traits. The primary role in detecting FR and preventing CVD belongs to primary care physicians.

In general, the set of medical and organizational measures for the prevention of CVD in primary care healthcare facilities includes:

1. Detection in patients with FR, diseases and conditions that contribute to the development of CVD.
2. Determination of overall or relative risk of CVD using the SCORE scale.
3. Carrying out measures to reduce the overall risk of CVD: educating patients on the prevention of CVD and healthy lifestyles; correction of FR – non-medicated and medicated; maintaining patients' motivations for maintaining health and correcting FR.
4. Monitoring of detected FRs and their degree of correction in high-risk individuals and patients with CVD.
5. Periodic reassessment of the risk of CVD in low- and moderate-risk patients¹².

It is proved that the provision of medical care on the basis of evidence-based medicine prevents the development of cardiovascular complications, reduces mortality in patients with CVD.

In this regard, studies to improve the organization of provision of population and healthcare facilities for pharmacotherapy for cardiovascular diseases are promising.

When choosing the most appropriate pharmacotherapy options based on the main provisions of evidence-based medicine, safety and economic feasibility, the key role in rational drug therapy plays availability of objective information¹³.

In the treatment of CVD use a large arsenal of drugs: nitrates, β -blockers, calcium channel blockers, etc. In recent years, developing a fundamentally new approach to pharmacotherapy of kardomateas, consisting in the combined use of traditional drugs and drugs of plant origin (DPO), as DPO most compatible with each other and with synthetic drugs, which leads to synergism their actions. The efficacy of pharmacotherapy for CVD is caused by the softness, prolongamento actions, the absence of many adverse reactions that are the usual companions of the reception of synthetic drugs. Interest in the treatment of DPO caused by changes in the age structure of

¹² Наказ МОЗ України від 01.06.2012 № 419 “Про затвердження реєстру граничного рівня оптово-відпускних та порівняльних (референтних) цін на лікарські засоби для лікування осіб з гіпертонічною хворобою станом на 1 червня 2012 року”.

¹³ Наказ МОЗ України від 02.03.2011 р. № 127 “Про затвердження примірних таблиць оснащення медичною технікою та виробами медичного призначення центральної районної (районної) та центральної міської (міської) лікарень”.

the population: increase in the number of elderly and senile age, suffering from CVD, which require prolonged use of drugs, as well as the risk of adverse side effects, which should be minimal. There is a perception that the complex of biologically active substances formed in the living plant cell has a greater similarity with the human body than pure isolated substance, so herbal drugs assimilate easier and gives fewer side reactions. It should be noted that medicinal plant raw materials is the most cheap and affordable source of medicines¹⁴.

As of May 1, 2018, 1141 phytopreparations and substances of plant origin or medicinal products with the participation of biologically active compounds from plants were registered in the State Register of medicinal products, of which 645 were preparations of domestic production, 496 – of foreign production. In particular, the analyzed preparations include raw materials or biologically active substances of 167 species of medicinal plants and lichens, which are divided into two groups: raw material, which is allowed for use in medical practice as a medicinal product (for the preparation of infusions and decoctions) and in the form of raw materials, registered only as “technical” – for the preparation of drugs in various chemical and pharmaceutical industries¹⁵.

The latter do not belong to medicines, but are the raw material for the industrial production of finished drugs.

Medicinal herbal drugs that are in circulation are conventionally divided into the following groups:

1. Medicinal plant raw materials: dried, rarely freshly picked parts of medicinal plants used to obtain drugs. Monopreparations from medicinal herbal raw materials – one kind of crushed, rarely holistic medicinal plant. Medicinal fees are mixtures of several types: crushed, rarely whole medicinal plant raw materials, sometimes with the addition of salts, essential oils.

2. Total crude herbal preparations contain biologically active and related substances (infusions and decoctions, tinctures, extracts, elixirs).

3. Total purified phytopreparations contain biologically active substances and as much as possible purified from related and ballast substances.

¹⁴ Наукове обґрунтування доцільності подальшого включення лікарських засобів рослинного походження до державного формуляру лікарських засобів / Х.І. Макух, Т.Б. Ривак, А.Б. Зіменковський [та ін.]. *Фармацевт. журн.* 2010. № 1. С. 31–35.

¹⁵ Профілактика серцево-судинних захворювань (за матеріалами “Уніфікованого клінічного протоколу первинної, вторинної (спеціалізованої), третинної (високоспеціалізованої) медичної допомоги. Профілактика серцево-судинних захворювань”, адаптована версія. *Український медичний вісник / Therapia.* 2017. № 7-8. С. 47–52.

4. Phytopreparations of the individual maximum purified compounds (isolated from plants biologically active substances of direct effect).

5. Complex phytopreparations contain compounds isolated from plants and substances of non-plant origin (synthetic, endocrine, etc.)¹⁶.

In the treatment of cardiovascular diseases, several major groups of herbal medicines are used, which are given in table 1¹⁷.

Table 1

Analysis of groups of herbal medicines in the treatment of cardiovascular diseases

| № | Group | Action | Name DPO |
|---|--|--|--|
| 1 | Cardiotonic agents | Increase myocardial contractions, regardless of changes in pre- and post-load on the heart, capable of increasing the strength of the heart contractions | Cardiac glycosides contain such plants as digitalis purple and woolly, hellebore, jaundice, mustard, lily of the valley, strophant, onion, oleander. The cardio-tonic agents include hawthorn blood-red, astragalus, magnolia, which have nootropic effects (lowering blood pressure, due to a decrease in heart rate and strength) |
| 2 | Vascular expansion, antiarrhythmic, antihypertensive and antispasmodic drugs | Reduce systemic blood pressure (antihypertensive effect) in hypertension. Normalize the tempo (frequency) of contractions of the heart and restore the broken heart rhythm | The antihypertensive effect is peculiar to canine nettle, marsh dryness, medicinal rump, meadow geranium, hawthorn, cyanotic blue, aronia and woolly Astragalus. The antispasmodic effect is shown by flavonoids, coumarins, alkaloids contained in peppermint, anise, hops, hawthorn, parsnip, lemon balm, fennel, periwinkle, and mother |

¹⁶Профілактика серцево-судинних захворювань: історичний аспект та сучасний стан проблеми / І.М. Гідзинська, Г.З. Мороз, Т.С. Ласиця, О.О. Дзівінська. *Український медичний вісник / Therapia*. 2015. № 6. С. 62–64.

¹⁷ Профілактика серцево-судинних захворювань: чи завжди ми встигаємо? / І.В. Давидова, Н.А. Кожухарьова, Л.І. Конопляник, Т.В. Сімагіна. *Сімейна медицина*. 2016. № 6. С. 20–24.

Table 1 (ending)

| № | Group | Action | Name DPO |
|----------|------------------------------|--|--|
| 3 | Anti-sclerotic agents | Antisclerotic action has substances that can reduce the level of cholesterol in the blood and increase the excretion of bile precursors of its synthesis in the liver. An important point of anti-sclerotic effect is the strengthening of the vascular wall due to flavonoids, vitamin P and tocopherol (vitamin E) | These properties have garlic, onion, wild garlic, mistletoe, white, dandelion, burdock, immortelle, yarrow, ruby, hawthorn, sea kale, diaspora Japanese, clover, nettle, calendula, flax seeds |
| 4 | Diuretics | Increase the excretion of sodium ions and water by the kidneys | Diuretic medicinal plants: field horsetail, spore, kidney tea, cranberries, birch, martyr, blueberries, juniper, dill, fennel |
| 5 | Sedative, psychotropic drugs | Soothing remedies are necessary for cardioneurosis, for the purchase of spasms of nerve effects on the vessels of the heart, the purchase of spasm of regional arteries of the heart, brain and extremities, as well as the normalization of sleep (psycho-sedative action), have a calming effect on the central nervous system | Calming red-blood, valerian, oregano, linden, lemon balm, peppermint, white mistletoe, peony, canine nettle, pharmacy chamomile, marsh drought, cyanotic, thyme, have a calming effect. The strongest sedative effect is given by the bruise and peony |

Information about the structure of the market of drugs, including cardiovascular drugs, obtained on the basis of the mentioned classification and data of the State Register of drugs, are given in table 2¹⁸.

¹⁸ Саханда І.В., Косяченко К.Л., Негода Т.С. Characteristics of the factors determining demand for highly effective medicinal products with plant origin for the treatment of cardiovascular diseases. *Журнал "Фітотерапія. Часопис"*. 2018. С. 15–18.

Table 2

**Pharmacotherapy for cardiovascular disease according
to the State Register of medicinal products**

| DPO | Specific weight,% |
|-------------------------------------|--------------------------|
| 1. Medicinal plant raw materials: | 4,9 |
| 1.1. Monopreparations | 1,6 |
| 1.2. Convocation | 3,3 |
| 2. Total crude preparations: | 36,5 |
| 2.1. Infusions, decoctions | 3,4 |
| 2.2. Tinctures | 12,7 |
| 2.3. Extracts | 20,2 |
| 2.4. Elixirs | 0,2 |
| 3. Total purified phytopreparations | 6,7 |
| 4. Individual compounds | 43,6 |
| 5. Complex phytopreparations | 8,3 |

The results of the analysis of the data presented in table 2, indicate that individual compounds (43,6%) and herbal remedies (36,5%) account for the largest share of all DPO for CVD pharmacotherapy in the Ukrainian market.

In the treatment of coronary heart disease, drugs containing herbal raw materials with sedative, antispasmodic, capillary and anti-anginal effects are widely used.

Phytotherapy of cardiac arrhythmias and conduction implies the use of sedative, tranquilizing, antiarrhythmic and metabolic as well as cardiotoxic drugs.

For the prevention and treatment of atherosclerosis use anti-sclerotic drugs that inhibit cholesterol absorption, inhibit the synthesis of cholesterol and triglycerides, increase utilization, accelerate metabolism and excretion. The main principle of pharmacotherapy of heart failure is the use of cardiac glycosides, although at the initial stage of therapy it is possible to use herbal drugs that do not contain cardiac glycosides, but have cardiotoxic, antihypoxic, sedative and diuretic effects. Hypotension phytotherapy involves the use of tonic¹⁹.

¹⁹ Саханда І.В., Сятиня М.Л., Негода Т.С. Вивчення асортименту лікарських препаратів рослинного походження для лікування серцево-судинних захворювань. II Міжнародна науково-практична internet-конференція "Теоретичні та практичні аспекти дослідження лікарських рослин", 21–23 березня 2016 року: матеріали конференції, м. Харків. С. 216–218.

2. Analysis of medicinal herbs for the treatment of cardiovascular diseases

In the list of DPO used in the treatment of CVD, the largest share is DPO based on valeriana (18,4%), lily of the valley, hawthorn, rauwolfia, digitalis (10,3%), bitterness (8,0%), canine nettles, lemon balm (5,7% each). Of the presented dosage forms, the largest share is extracts (33%), tinctures (13%); the share of new galenic preparations and herbal fees is relatively small: 6,7% and 3,3%, respectively. About 43% of the analyzed list of drugs are individually compounded: alkaloids (54%) and cardiac glycosides (46%).

However, it should be noted that long-term treatment with herbal medicines can adversely affect the course of a number of chronic diseases. The undesirable side effects of DPO on the cardiovascular system and contraindications to their use are given in table 3.

Table 3

Unwanted adverse reactions to the cardiovascular system and contraindications to the use of some plants

| Name of the plant | Possible side effects | Contraindications to use |
|-------------------------|---|--|
| Aralia Manchu | Sleep disturbance | Hypertension, insomnia, increased nervous excitability |
| Aronia is black-fruited | Changes in the properties of blood rheology | Increased ability of blood clotting, hypertension |
| Swamp bog | Reduction of blood pressure, tachycardia | An overdose by a plant (a poisonous plant) can cause depression, inflammation of the gastrointestinal mucosa |
| Immortal sandy | Increased blood pressure, cumulative properties | Hypertension |
| Hawthorn medicinal | Large doses cause slowing of the pulse and inhibition of the nervous system | Individual intolerance |
| Valeriana officinalis | With prolonged use headache, agitated state and disorders of the heart, tachycardia | Individual intolerance |
| Jerk medicinal | Headaches, bleeding | Tendency to bradycardia |
| Ginseng real | Insomnia, headaches | Hypertension, sclerotic changes in the vessels of the heart and brain |
| Went high | - | Hypertension |
| Hypericum | With prolonged use causes narrowing of blood vessels, increase in blood pressure | Hypertension |

Table 3 (ending)

| Name of the plant | Possible side effects | Contraindications to use |
|------------------------------|--|--|
| Golden Root (Rhodiola rosea) | Insomnia, headaches, increased irritability | Hypertensive crisis, atherosclerosis, hypotension caused by vegetative-vascular dystonia |
| Rhombus larynx | Heart palpitations | Organic diseases of the cardiovascular system |
| Lily of the valley | In overdose – arrhythmia, ventricular tachycardia, increased excitability | Sudden organic changes of heart and blood vessels, acute endocarditis and pronounced cardiosclerosis |
| The levia is safflower | - | Hypertension |
| Lemongrass chinese | In case of overdose – excitation of the nervous and cardiovascular systems | Increased excitability, hypertension, severe cardiac disorders |
| Foxglove purple and woolly | With prolonged use and overdose there is a sharp slowdown in heart rate, impaired cardiac activity | Bradycardia, angina and conduction disorders in the heart muscle |
| Men's fern | Reduction of cardiac activity | Cardiovascular failure, hypotension |
| Pasiflora incarnate | - | Angina angina, myocardial infarction, atherosclerosis of vessels of the brain and heart |
| Peony tree | Reduction of blood pressure | Individual intolerance |
| Nettles | Reduction of blood pressure | Hypotension |
| Thyme creeping | - | Sharply expressed cardiosclerosis, atherosclerosis of cerebral vessels, atrial fibrillation, pre- and post-infarction conditions |
| Chinese tea | Increased excitability | Heart disease |
| Eleutherococcus spiny | - | Atherosclerosis, hypertension |
| Ephedra horsetail | - | Hypertension, atherosclerosis, severe organic heart disease |
| Mountaineer bird | Overdose – a strong antihypertensive effect | Expressed bleeding action |
| Coriander sown | - | Myocardial infarction, hypertension |
| Stinging nettle | Increased blood pressure | Hypertension, atherosclerosis |
| Sweet naked | Increased blood pressure, fluid retention in the body | Hypertension, diuresis |

The list of medicinal plant raw materials, approved for use in medical practice as cardiovascular drugs, includes poisonous species of plants: bog, spring gortiz, lily of the valley, largemouth fox, purple foxglove. Poisonous plants are also included in the list of raw materials intended for the production of drugs: small periwinkle, jaundice spreading, reddish frostbite, ciliated foxglove, common oleander, mistletoe, stefania smooth, strobe combe, celandine lobel.

Presented results of treatment of cardiovascular diseases with herbal drugs (HD) testify to the high efficiency of pharmacotherapy of HD (tab. 4). A number of nosological forms of CVD with decreasing effectiveness of treatment of HD have the following appearance: asthma cardiac > myocardial dystrophy > angina pectoris > hypotension > heart failure > hypertension > blinking arrhythmia > dyscirculatory encephalopathy > myocardial infarction. Thus, HD play a significant role in the arsenal of advanced therapy for cardiovascular disease²⁰.

Table 4

Pharmacotherapy results of various nosological forms of CVD with the help of herbal drugs

| Nosological form of CVD | The number of patients | Total | Results of pharmacotherapy of herbal drugs | | | | | The effectiveness of therapy |
|-------------------------|------------------------|-------|--|-------------------------|-------------|-----------|---------------|------------------------------|
| | | | Practically healthy | Significant improvement | Improvement | Unchanged | Deterioration | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Hypertension | Absolute indicators | 486 | 189,0 | 204,0 | 32,0 | 55,0 | 6,0 | 0,69 |
| | Relative indicators,% | 100 | 38,9 | 42,0 | 6,6 | 11,3 | 1,2 | 70,00 |
| Hypotension | Absolute indicators | 336 | 176,0 | 102,0 | 7,0 | 50,0 | 1,0 | 0,74 |
| | Relative indicators,% | 100 | 52,4 | 30,4 | 2,1 | 14,8 | 0,3 | 74,30 |

²⁰ Саханда І.В., Негода Т.С., Сятиня М.Л. Експертна оцінка терапевтичної ефективності лікарських засобів рослинного походження що використовуються при серцево-судинних захворюваннях. Міжнародна науково-практична конференція “Сучасна медицина: актуальні питання”, 20–21 листопада 2015 року: матеріали конференції, м. Одеса. С. 12–13.

Table 4 (ending)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-------------------------------|-----------------------|-----|------|-------|------|------|-----|-------|
| Heart failure | Absolute indicators | 188 | 90,0 | 66,0 | 4,0 | 26,0 | 2,0 | 0,71 |
| | Relative indicators,% | 100 | 47,9 | 35,1 | 2,1 | 13,8 | 1,1 | 72,00 |
| Myocardial dystrophy | Absolute indicators | 44 | 20,0 | 22,0 | 1,0 | 1,0 | 0 | 0,81 |
| | Relative indicators,% | 100 | 45,4 | 50,0 | 2,3 | 2,3 | 0 | 82,00 |
| Myocardial infarction | Absolute indicators | 15 | 2,0 | 7,0 | 4,0 | 1,0 | 1,0 | 0,52 |
| | Relative indicators,% | 100 | 13,2 | 46,7 | 26,7 | 6,7 | 6,7 | 53,00 |
| Water of the heart | Absolute indicators | 23 | 4,0 | 15,0 | 0 | 4,0 | 0 | 0,62 |
| | Relative indicators,% | 100 | 17,4 | 65,2 | 0 | 17,4 | 0 | 63,00 |
| Dyscirculatory encephalopathy | Absolute indicators | 206 | 34,0 | 128,0 | 23,0 | 19,0 | 2,0 | 0,64 |
| | Relative indicators,% | 100 | 16,5 | 62,1 | 11,1 | 9,3 | 1,0 | 65,00 |
| Cardiosclerosis | Absolute indicators | 67 | 9,0 | 40,0 | 7,0 | 11,0 | 0 | 0,59 |
| | Relative indicators,% | 100 | 13,4 | 59,7 | 10,5 | 16,4 | 0 | 60,00 |

The pharmaceutical sector is one of the highly profitable and emerging industries that is influenced by the following factors:

- changing demographic indicators of the population towards increasing the number of elderly people;
- increase of purchasing power of the population;
- level of social security;
- change of structure of morbidity;
- development of innovative methods of pharmacotherapy of various diseases²¹.

The pharmaceutical market of Ukraine is very diverse in structure and has 1226 entities as of May 1, 2018 (tab. 5).

²¹ Future Trends in Standardization of Herbal Drugs / P.H. Nikam, J. Kareparamban, A. Jadhav, V. Kadam. *J. Appl. Pharm. Sci.* 2012. Vol. 2, № 6. P. 38–44.

Table 5

The subjects of the pharmaceutical market of Ukraine as of 2018

| Types of pharmacy institutions | Total | Including by ownership | | | |
|--------------------------------|-------|------------------------|------|---------|------|
| | | state | | private | |
| | | number | % | number | % |
| Production pharmacies | 114 | 109 | 95,6 | 5 | 4,4 |
| Homeopathic pharmacies | 4 | 1 | 25,0 | 3 | 75,0 |
| Hospital pharmacies | 44 | 41 | 93,8 | 3 | 6,8 |
| Pharmaceutical warehouses | 133 | 9 | 6,8 | 124 | 93,2 |
| Pharmacy items | 444 | 187 | 42,1 | 257 | 57,8 |
| Optical stores | 24 | 8 | 33,3 | 16 | 66,7 |
| Total | 1226 | 473 | 36,9 | 753 | 63,1 |

The wide popularity of cardiovascular drugs, including herbal drugs, is also evidenced by pharmacy sales data (in% of total sales) presented in Fig. 1.

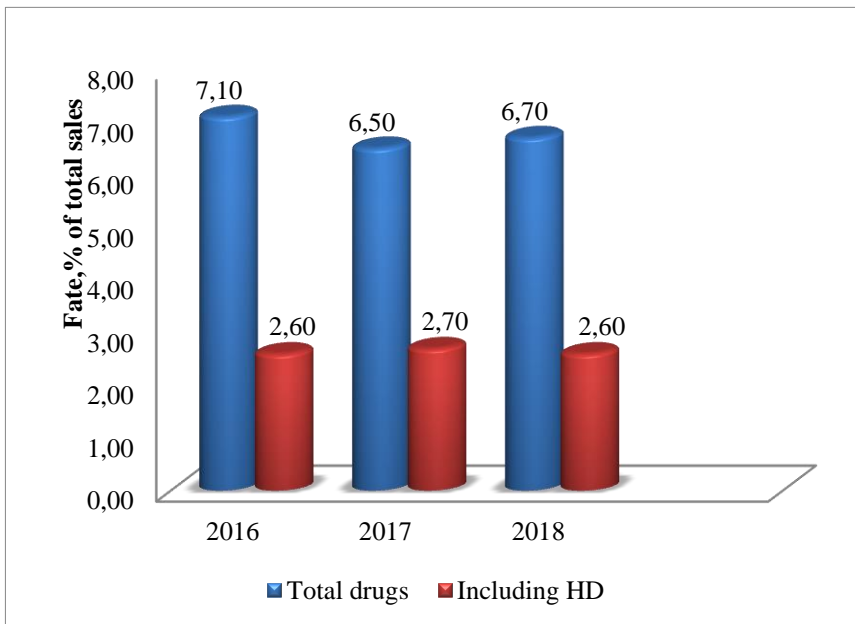


Fig. 1. Dynamics of pharmacy sales of cardiovascular drugs in the pharmaceutical market of Ukraine

Statistical analysis shows the stability of cardiovascular drugs in the TOP 20 different ATC groups in recent years. According to these figures 35–43% of all cardiovascular drugs have PO.

CONCLUSIONS

International and domestic practice shows that one of the most important areas of modern medicine is the systematic implementation of a comprehensive system of regulatory support for the provision of medical care through standardization and certification work in the health care of Ukraine. Found that the constant growth of demand on the cardiovascular DPO for many reasons, among which, in our opinion, the main are: high efficiency DPO; relative safety actions and poor severity of adverse reactions; the possibility of an optimal combination of DPO, both among themselves and with synthetic drugs, which is especially important for drug therapy of patients of older age groups and patients with concomitant pathology.

SUMMARY

The regulatory system enables the protection of the rights of citizens in the field of health care, exercise effective control and regulate the work of medical institutions, medical and pharmaceutical representatives. Rational pharmacotherapy implies the choice of optimal medicines. Thus, under the rational use of drugs by the majority of experts refers to the use of drugs with proven efficacy, safety and optimal cost that affects the achievement of clinical effect. This means that the decision about the use of each property should be based on analysis of objective data on its effectiveness, safety and economic feasibility. Almost all units of the pharmaceutical market, except for homeopathic pharmacies and optics stores, have in their range of drugs for the treatment of cardiovascular diseases, in particular drugs of HD. Thus, poisonous, toxic properties, as well as undesirable side reactions of some herbal remedies require careful and reasonable choice of DPO for both individual and complex use. When appointing physicians to the DPO, it is advisable to select those who do not give complications in each case. To evaluate the ratio of efficacy and safety of DPO in the treatment of CVD is allowed by the statistical results of the use of DPO, given in table 3 (results of pharmacotherapy according to statistical reports). Creation and development of the standardization system in the health care of Ukraine, taking into account the basic principles of evidence-based medicine and clinical economy, allows to determine the basic methodological approaches to the development and improvement of standards, industry norms, rules and terminology, to create a quality management system, ie to influence the

medical-diagnostic process, using both reasonable and adequately assessed statistics, appropriate real financial leverage and an objective assessment of the quality of care.

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