

PRACA POGLĄDOWA
REVIEW ARTICLE

ASSORTMENT OF HERBAL MEDICINES OF THE TREATMENT OF CARDIOVASCULAR DISEASES

ASORTYMENT PREPARATÓW ZIOŁOWYCH W LECZENIU CHORÓB UKŁADU SERCOWO-NACZYNIOWEGO

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ABSTRACT

Introduction: Medicinal plants are an effective means of prevention of many cardiovascular diseases in high-risk groups. Also, they are often used as a means of adjuvant therapy. Centuries of experience in the use of medicinal plants in folk medicine is the result of their relatively high efficiency and their wide distribution in natural ecosystems, and sometimes close to human habitation.

The aim of this work is to study the assortment of herbal medicinal products and to consider examples of the basic methods of treatment of cardiovascular diseases with medicinal plants.

Materials and methods: In the work the marketing method, monitoring methods, logical generalization, grouping and graphic method of research were used. A comparative analysis of the assortment and economic availability of cardiological drugs of plant origin, presented on the pharmaceutical market of Ukraine.

Review: As the study showed, in the period under review the total assortment of the Ukrainian phytopreparation market had a pain of two thousand titles, namely: 2280, which was about 17%, that is almost a fifth of the officially published figure for all drugs registered for period 2001-2016 years (13,5 thousand). This is a rather high indicator, indicating the importance of drugs with medicinal plant raw materials (MP RM) for the treatment and prevention of various diseases. Among the medicinal forms of plant almost half (41,8%) falls on the share of liquid forms: solutions for internal or external use, for injections, drops, syrups, etc., 31,6% are solid dosage forms: capsules, powders, etc. More than 13% of the assortment for soft forms: ointments, liniments, suppositories, etc. Among medicines there are also medicinal herbal remedies in the form of collections, briquettes, tea, whose specific gravity is 9,1%. Other dosage forms, which account for only 3,7%, represented by aerosols (15 items), concentrates, cubes.

Conclusions: The list of plants that have been shown to reflect the main approaches to the herbal medicine of diseases of the cardiovascular system: it is the use of cardiac glycosides the first high-performance drugs to treat heart failure; the P-active compounds that strengthen blood vessels and regulate the body's metabolism; a variety of alkaloids, including stimulating activity of the organism, which is important, such as hypotension. The analysis of the assortment of phytopreparations on the Ukrainian market showed that the assortment of medicines is characterized as a dynamic system that is constantly updated for a set of domestic drugs or registration for the first time in Ukraine of herbal preparations that have won consumer preferences abroad.

KEY WORDS: cardiovascular diseases, hypertension, medicinal plants

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INTRODUCTION

In recent years, the rapidly growing incidence of cardiovascular diseases, which are beginning to appear in younger people. However, adherence to medication therapy, prescribed as primary prevention, our population is very low. Development of adverse reactions to medication drugs as they are hypersensitive, allergic addiction, negative reaction on the part of other organs and systems, significantly reduces the effectiveness of treatment. The way out of this situation may be drugs of medicinal plants, which continue to play a significant role in the arsenal of therapeutic agents.

In developed countries, mortality from cardiovascular diseases are among the highest. This is due to a heavy load on the nervous system, which soon leads to hypertension, sedentary lifestyle of many people, because of what the body does not receive required to maintain the normal op-

eration of all systems of exercise, poor diet, which leads to the deposition of atherosclerotic plaques in blood vessels. Result of human exposure to these factors are heart attacks and strokes. For the treatment of cardiovascular diseases are developed and used various medications.

Plants with healing properties this is the first medication that a person has used. Many are now common pharmaceutical drugs extracted from herbs or created by using them. The peculiarity of many medicinal plants are a non specific effect on the body, the side effects of a number of medicinal plants is not as pronounced [1]. A number of herbs are grown on plantations as a raw material for the pharmaceutical industry.

The urgency of the use of herbal medicinal products in the treatment of diseases of the cardiovascular system is primarily due to the very low probability of the develop-

ment of unforeseen side effects, as well as the presence in their composition of active components with proven efficacy, such as alkaloids and glycosides. The sufficiently pronounced clinical effect, the possibility of prolonged use and the combination of these drugs with other drugs are of great importance in the treatment of patients with functional disorders and chronic diseases.

In connection with the introduction of evidence-based clinical practice in clinical practice, the conduct of large-scale studies of clinical efficacy and safety of medicines, the development of agreed standards for the treatment of the most common diseases, the role and place of cardiological drugs, which today are widely used in the treatment of many, in particular cardiovascular diseases, is the subject of lively discussion of doctors and scientists.

THE AIM

The aim of this work is to study the assortment of herbal medicinal products and to consider examples of the basic methods of treatment of cardiovascular diseases with medicinal plants.

MATERIALS AND METHODS

The assortment of medicinal plants that are used for the prevention and treatment of cardiovascular diseases; the study the parameters of the evaluation of their assortment.

The parameters of the assortment evaluation were quantitative and qualitative characteristics:

- the breadth of the range (number of registered funds);
- structure (on drugs, manufacturers, medicinal forms, types of medicinal plants, pharmacotherapeutic actions).

REVIEW AND DISCUSSION

There are the following cardiovascular diseases:

- Heart diseases are related to the violation of the blood supply of the heart muscles (complication - myocardial infarction), breach of potassium and calcium, disruption of the nerve fibers of the heart;
- vascular diseases are associated with increased permeability of blood vessels, narrowing them;
- diseases of the cardiovascular system as a whole are hypertension, hypotension etc.

CARDIAC GLYCOSIDES

These are substances that selectively stimulate the activity of the cardiac muscle of heart failure, a therapeutic concentration little effect on the operation of a healthy heart. As a result of their action in the heart muscle increases the content of calcium ions are involved in muscle contraction. Moreover, they will reactivate vagus nerves and the contraction of the heart slows, causing bradycardia or eliminating characteristic of heart failure a tachycardia (a sharp increase in heart rate and heart rate weakness). They change the nature of nerve impulses through the nervous

system of the heart, causing a partial flow of impulses from the atria to the ventricles (atrioventricular block). Cardiac glycosides increase the automaticity of the heart.

Glycoside molecule consists of a balance of carbohydrate - glucone and insipidus parts are aglycone. The aglycone of cardiac glycosides is pergidrotsiklopentanofenantrén structure. The molecules are decomposed in the light, so plants that contain cardiac glycosides, after collection are stored in a dark place [2].

P-ACTIVE COMPOUNDS (FLAVONOIDS)

These are substances that reduce permeability and fragility of blood vessels. The body can not produce them on their own, so this group of compounds like vitamins is not indicated. This group includes rutin, catechin, coumarin, anthocyanins etc. These substances are involved, along with vitamin C in the redox of processes in the body, protects ascorbic acid from oxidation. Lack of flavonoid resulting in increased permeability and capillary fragility, resulting in hemorrhages appear on the skin and subcutaneous tissue, especially in areas which are subjected to physical stress. The excess of P-active compounds excreted with urine [3].

THE ALKALOIDS

This nitrogen-containing substances of diverse structure, a common property which - in an alkaline reaction solution and reacting with acids to form salts. Many alkaloids act on the nervous system by activating or blocking certain channels. The vinca alkaloids are expand small vessels.

Potassium is slows and weakens the heart muscle. Lots of potassium comprise, such as apricots, but the concentration of potassium in them is not high enough to provide a pronounced therapeutic effect. Fruits of *Prunus armeniaca* are often a component of nutritional therapy for hypertension.

After studying the assortment of medicinal plants that are used for the prevention and treatment of cardiovascular diseases, we decided to study the parameters of the evaluation of their assortment.

The parameters of the assortment evaluation were quantitative and qualitative characteristics:

- the breadth of the range (number of registered funds);
- structure (on drugs, manufacturers, medicinal forms, types of medicinal plants, pharmacotherapeutic actions) [4].

The results of the analysis are presented in the form of absolute (number) and relative (percentage in %) indicators. The index of renewal is calculated as the ratio of the number of new drugs (for three to five years) to the total number of funds in the group.

Characteristic of the domestic phytopreparation market for 2001-2016 is presented in Table I, the grouping of data is given in accordance with the percentage of phytopreparations on the Ukrainian market.

As the study showed, in the period under review the total assortment of the Ukrainian phytopreparation market had a pain of two thousand titles, namely: 2280, which was about 17%, that is almost a fifth of the officially pub-

Table I. Assortment of the Ukrainian phytopreparation market (2001-2016)

Phytopreparation groups	Total phytopreparations		Production,%		Upgrade index
	abs.	proportion, %	domes.	foreign	
1.Medicinal plants, raw materials and preparations from them	584	25,6	100,0	-	0,1
2.Medicinal products	572	25,1	49,1	50,9	0,7
3.Substances and excipients	18	0,8	84,2	15,8	0,2
4. Multivitamins	23	1,0	4,5	95,5	1,0
5.Homeopathic remedies	1023	44,9	4,7	95,3	1,0
6.Means of nutrition and dietary supplements	60	2,6	8,3	91,7	1,0
Total	2280	100,0	36,3	63,4	0,7

lished figure for all drugs registered for this period (13,5 thousand). This is a rather high indicator, indicating the importance of drugs with medicinal plant raw materials (MP RM) for the treatment and prevention of various diseases [5].

Structural analysis of the investigated segment of the pharmaceutical market (Figure 1) showed that the largest share of the assortment (44,9%) is occupied by homeopathic remedies that have been distributed and officially recognized in the last decade.

Approximately in equal shares, and quite significant (the fourth part), in the potential phytopreparation market the following groups are represented:

- 1) «Medicinal plants, raw materials and preparations from them» - 25,6%;
- 2) «Medicinal products» - 25,1%.

The remaining groups occupy in the structure of minor proportions of 0,8-2,6% [6].

Analysis of the segmentation of the above-mentioned groups on the basis of production evidence indicates that a third of the assortment (36,6%) is phytopreparations of domestic producers (Figure 2).

The study of the structure of the drug assortment according to the types of pharmacotherapeutic action (according to the data provided in the State Register) showed that among the main groups antimicrobial, antiviral means for systemic use – 15,7% (98), for the respiratory system – 13,0% (81), for the treatment of the cardiovascular system – 13% (81), for the treatment of the digestive system – 9,1% (57), antitumor – 8,3% (52), for the treatment of the nervous system – 6,4% (40).

Most often, domestic drugs are made from raw materials of valerian, hawthorn, dog rose, ginseng, mint, eucalyptus, chamomile, licorice, lily of the valley, garlic and other plants [7].

When studying the structure of the assortment by types of dosage forms, it was established that a large proportion of the first group was occupied by medicinal herbal preparations in the form of raw materials, collections, briquettes – 65,4% (Figure 3). Phytopreparations (ready-made medicines) are liquid (balms, oils, extracts, etc.) and solid forms:

21,2 and 12,2%, respectively, a small fraction – 1,2% soft forms (suppositories, ointments).

Medicinal preparations with substances of plant origin are offered by 40 foreign manufacturers. Germany ranked first in the ranking of producing countries, which registered a quarter of drugs – 24,9% (97 drugs), the second Ukraine – 20,5% (80), France third – 10,2% (40), fourth and fifth places occupy Slovenia and India 5,9-6,4% (23-25 drugs). The number of drugs produced in the last 35 countries varies from 16 (Belarus) to 1 phytopreparation (a whole group of countries, in particular the United Kingdom, Indonesia, the Netherlands, etc.) (Fig. 4).

The study of the structure of the assortment of domestic phytopreparations for therapeutic action showed that antiseptic (13,7%), choleric (7,7%), strengthening (7,1%), anti-inflammatory (7,1%), antiviral (7,1%), cardiotoxic (6,1%), locally irritating (5,5%), spasmolytic (5,5%) funds. There are also sedative, antiulcer, antimicrobial, antihemorrhoid, adaptagens, analeptic, antitumor, lipid-lowering, analgesic, diuretics and other phytopreparations in the assortment.

CONCLUSIONS

1. Above we have discussed some of the plants used to treat cardiovascular diseases. The list of plants that have been shown to reflect the main approaches to the herbal medicine of diseases of the cardiovascular system: it is the use of cardiac glycosides the first high-performance drugs to treat heart failure; the P-active compounds that strengthen blood vessels and regulate the body's metabolism; a variety of alkaloids, including stimulating activity of the organism, which is important, such as hypotension. A number of medicinal plants are representatives of ruderal flora (*Leonurus cardiaca*). This leads to extensive use of plants in medicine.
2. We have seen that the plants are widely used in medicine. A large part of modern pharmaceuticals used for the treatment of cardiovascular diseases are the continuation of the approaches that were started using herbal medicines.

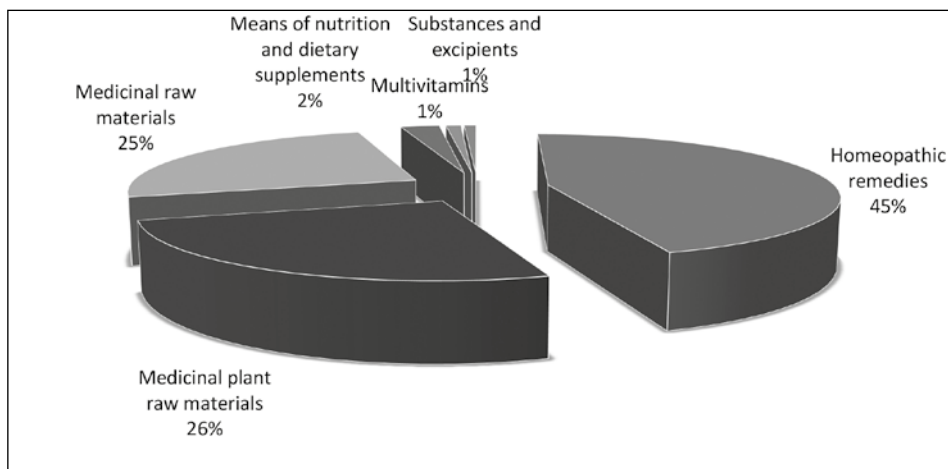


Fig. 1. Structural analysis of the phytopreparation market, %.

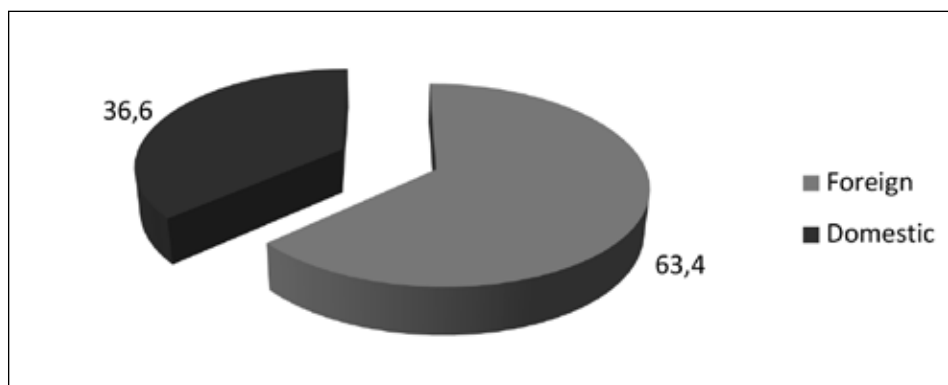


Fig. 2. Structure of the Ukrainian market of phytopreparations according to the production feature (%).

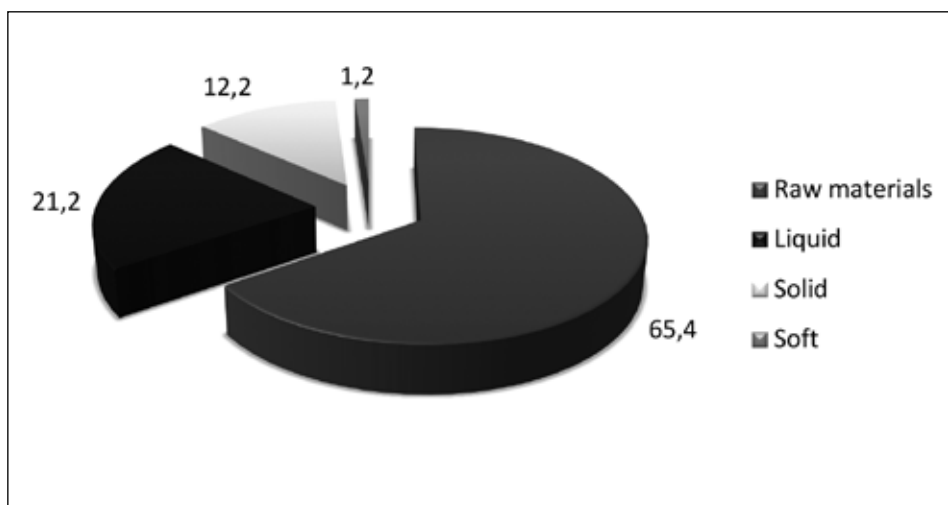


Fig. 3. Structure of assortment of phytopreparations of the group «Medicinal plants, raw materials and preparations from them» by types of medicinal forms (%).

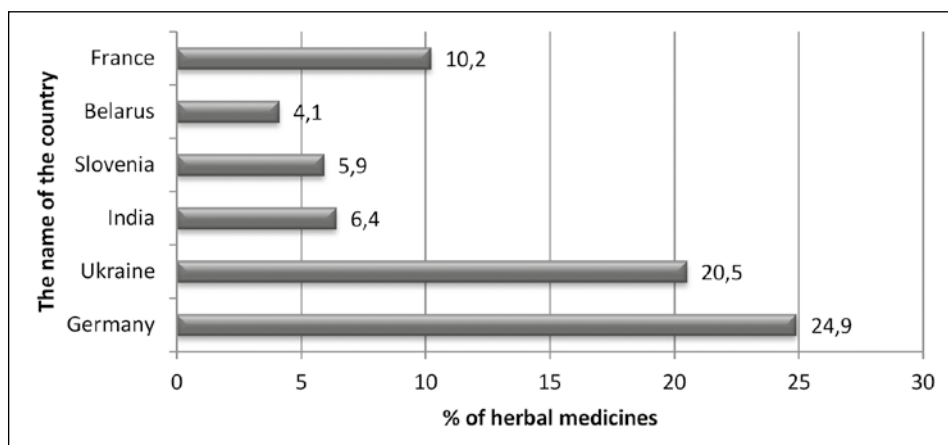


Fig. 4. Rating of foreign countries representing herbal medicines (%).

3. The analysis of the assortment of phytopreparations on the Ukrainian market showed that the assortment of medicines is characterized as a dynamic system that is constantly updated for a set of domestic drugs or registration for the first time in Ukraine of herbal preparations that have won consumer preferences abroad.

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Authors' contributions:

According to the order of the Authorship.

Conflict of interest:

The Authors declare no conflict of interest.

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