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Prospects For Phytopreparations (Botanicals) Use In Modern Pharmacology

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ABSTRACT: Relevance. In recent years, the popularity of phytotherapy, despite the great success in the development of chemical medicines, is increasing. Interest in the natural healing substances and preparations created on their basis has increased due to both the unique properties of phytopreparations and the rapidly developing technologies of research in biology, medicine and the production of medicines. Methodology. The analysis and structuring of the content of literature sources containing information on herbal medicines was carried out. Results. Herbal preparations (botanicals) have the following advantages: low toxicity at a sufficiently high efficiency; wide range of therapeutic effects; integrated organoprotective effect; harmonizing effect on all organs and systems of the body; minimal side effects; the relative cheapness compared with synthetic drugs; the possibility of cooking in the home. Herbal medicine has been applied as a primary and secondary prevention of various diseases, recovery and rehabilitation of the general population under the impact of negative environmental factors as a means of improving the health of adaptive reserves of the organism, in sports medicine.

KEYWORDS: herbal; treatment; prevention; pharmacology healthy person.

In recent years, the popularity of herbal medicine, despite great success in the creation of synthetic drugs, is increasing. Interest in natural healing substances and preparations based on them does not weaken due to the unique properties of herbal medicines and rapidly developing research technologies in biology, medicine, and, in particular, in pharmaceuticals.

One of the reasons for increasing attention to phytotherapy is a resurgence of interest in nature-pharmacy in general. A new clinical direction has emerged and is developing — bioinformatic medicine. Its emergence was facilitated by the accumulation of facts of positive mutual influence of various forms of life. Plants appear to be the primary sources of most bioactive substances. All plants have life-supporting properties: antiseptic, regenerative, drainage and anti-inflammatory. The versatile influence of plant components on the human body is explained by their information-regulating activity.

Today, phytotherapy significantly expands the scope of its competence. For example, new approaches are being developed in herbal medicine for severe chronic diseases and oncological diseases. This is due to both experimental studies of the factors that cause diseases (impaired immunity, allergies, inflammation, etc.), a deeper understanding of the processes of disease occurrence, and the development of modern technologies in their treatment.

The development of modern analytical technologies makes it possible to obtain data on the chemical components of herbal remedies, which are the basis for understanding the mechanisms of their action at the cellular level [24]. The main components of herbal medicines are considered to be alkaloids, anthraquinones, carotenoids, flavonoids, glycosides, phenolic compounds of phenylpropanoids, ecdysteroids [3, 19, 26].

For example, it has been shown that phytoecdysteroids, structural analogues of invertebrate molting hormones, increase the body's nonspecific resistance to adverse environmental factors, physical and mental stress, and stress. Now the prospect of using phytoecdysteroids in composition of biologically active food supplements and products functional nutrition in sports, restorative medicine, geriatrics [3].

It is assumed that as a result of the synergistic interaction of sugars and phenolic compounds, a certain integrative redox system is formed, which is a mechanism for increasing the tolerance of plant cells to the action of stress-causing factors [25]. This mechanism may underlie the pharmacological stress-protective effects of herbal preparations.

It was revealed that the composition of plants contains biologically active compounds that are characteristic almost exclusively for animal organisms. These compounds are mainly mediators of the central nervous system, hormones and enzymes, as well as metabolic regulators: adrenaline, acetylcholine, histamine, serotonin, pepsin, etc. The role of these substances in animal organisms and their medicinal value are well studied [4].

It has been shown that a number of medicinal plants are of interest as promising sources of adaptogenic, nootropic, anxiolytic, immunomodulatory, hepatoprotective, antioxidant, antidepressant, tonic drugs. These groups of drugs are effective correctors of functional conditions that impede the life of a practically healthy person in normal and extreme conditions [11, 14].

Over the past 15-20 years in the field of pharmacognosy, there have been qualitative changes in the technical capabilities of studying the chemical composition of medicinal plants and herbal medicinal products. This was facilitated by the enrichment of this science with modern spectral and other physical and chemical methods. The introduction of thin-layer chromatography, gas-liquid chromatography, high-performance liquid chromatography, nuclear magnetic resonance spectroscopy, and other methods have opened up new opportunities for the introduction of science-based technologies for the production of drugs, including those based on phenylpropanoids and flavonoids, as well as improving the standardization of herbal remedies [8].

One of the important aspects of the revival of interest in herbal medicines and the successful development of this area of pharmacology at the present stage is the use of innovative technologies for the isolation of biologically active substances of medicinal plants, which determine the higher efficiency of modern herbal medicines [8]. The current stage of the development of drugs from plant materials is characterized by a high saturation with innovative methods of research and production of pharmacological preparations. The involvement of innovative technologies has made it possible to significantly increase the pharmacological effectiveness of both drugs that have been on the market for a long time, as well as new ones [8, 16].

Currently, approaches to assessing the innovativeness of drugs are being intensively developed. Approaches to the development of a "scale of total innovativeness" of drugs are considered, which is associated with the need to create a unified system for their assessment according to this complex parameter [15].

High-quality modern herbal preparations fully meet the standards of quality, efficiency and safety, are absorbed by the body as fully as possible, without loading it with ballast or toxic compounds and without causing allergic reactions, are usually well tolerated by people of different age categories, have a minimum of side effects and contraindications. Modern technologies using high-purity plant extracts allow the production of drugs containing a strictly defined dose of the active substance, which facilitates the calculation of the physiological and therapeutic dose for the individual consumer [6].

Simultaneously with the introduction of new technologies the production of preparations, methodological bases for the selection of plant objects as sources of herbal preparations are being developed. They include a systematic approach involving modern technologies based on the synergy of mathematical methods, information technology and pharmacognostic knowledge, which allows minimizing labor and time costs and automating screening, research of new plant objects and the creation of drugs based on them with evidence-based therapeutic efficacy [12].

An important link in the promotion of herbal medicines to the pharmaceutical market is the issue of standardization. Recent studies have shown that for St. John's wort, the content of the sum of flavonoids in terms of rutin should be not less than 2%, in contrast to the figure in the SP of the USSR XI edition, which is 1.5% [17]. New approaches to the chemical standardization of raw materials of medicinal plants and phytopreparations are proposed, as well as methods for qualitative and quantitative analysis using standard samples of pharmacologically active chemical elements of plants [21]. The expansion of the market for herbal medicines is associated not only with the optimization of approaches to their standardization, but also with the improvement of methods for analyzing and evaluating pharmacological activity, safety and stability [23].

It is very important that today much attention is paid to the problems of the quality of pharmacological activity and the effectiveness of medicinal plant preparations. At the same time, attention is drawn to the fact that when introducing new drugs, it is necessary to resolve issues on the development of standardization methods, including the qualitative and quantitative assessment of biologically active substances, as well as optimal dosage forms of medicines [1].

Safety issues of preparations containing medicinal plants are also in the field of view of specialists. The problem of toxicity of medicinal plants caused by both exogenous factors (pesticides, toxic metals) and endogenous toxic compounds is considered [1]. It is emphasized that the relevance of the problem of toxicity of herbal drugs is aggravated due to the fact that most of them are available to patients without a prescription [27].

At the same time, the lack of awareness of the population about the properties, indications and contraindications for the use of herbal medicines, which have become widespread in the pharmaceutical market in recent years, is of concern abroad. For example, in the information materials available to the consumer, there is no information about the possible health hazard of the combined use of pharmacopoeial preparations and herbal medicines [22].

It should be noted that, despite technological advances and efforts made in the field of creating new substances, the number of new herbal medicines that have reached the market remains small [10].

In the Russian Federation, phytopreparations play a large role in the implementation of the strategy for drug supply of the population for the period up to 2025. Thus, one of the urgent tasks of modern pharmacy, including pharmacognosy, is the creation and implementation of import-substituting medicines. The expediency of creating import-substituting herbal preparations is substantiated by the results of physicochemical, spectral and pharmacological studies of phenolic compounds, phenylpropanoids and flavonoids contained in medicinal plants. It is noted that the greatest interest is caused by drugs that have adaptogenic, tonic, nootropic, antidepressant, anxiolytic, immunomodulatory, hepatoprotective and antioxidant properties, as well as drugs increasing the body's resistance to the action of pathogenic factors [1].

The teaching of herbal medicine in Russia is carried out at the Department of Herbal Medicine FPCMR of the Peoples' Friendship University of Russia, where for 13 years postgraduate training of doctors has been carried out, including four sections: theoretical; practical; organization of phytotherapy in a sanatorium, clinic, hospital, medical center; meetings of the society of phytotherapists and/or conferences are organized. In St. Petersburg, within the framework of the St. Petersburg Society of Therapists named after S.P. Botkin successfully works section of phytotherapists.

Herbal medicine, one of the oldest areas of medicine, has proven that the treatment of diseases with the help of medicinal plants is effective. Today, phytotherapy is a branch of medicine called pharmacognosy. Interest in herbal treatment among doctors and patients is steadily growing. An increase in interest in herbal medicine was facilitated by the revival of natural pharmacy in general, within which a new clinical direction has arisen and is developing - bioinformatic medicine.

In modern medical practice, phytopreparations are increasingly preferred, due to their many positive properties. Among these properties, low toxicity with a sufficiently high efficiency, a wide range of therapeutic effects, a complex organ-protective effect, and a harmonizing effect are of paramount importance on all organs and systems of the body, a minimum of side effects, relative cheapness compared to synthetic drugs, the possibility of cooking at home. Phytopreparations, prescribed in a timely manner, allow you to restore circadian biorhythms, reduce the development of somatic pathology caused by psychogenic factors, improve the quality of life, and in conditions of disadaptation, mitigate the negative impact on the human body of stressful and adverse environmental and production factors.

The quality of modern drugs from medicinal plants is constantly improving due to the widespread use of innovative technologies in their production, from the selection of plant materials, the isolation of biologically active substances of medicinal plants and ending with the methods of production of drugs and their standardization.

Phytotherapy has found application as a primary and secondary prevention of various diseases, as a measure for the improvement and rehabilitation of the general population under the influence of negative environmental factors, as a means of increasing adaptive reserves of a healthy organism, in sports medicine.

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