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QUALIFICATION WORK

on the topic: "**MARKETING ANALYSIS OF THE MARKET OF MEDICINES USED IN THE TREATMENT OF VASCULAR DYSTONIA**"

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АНОТАЦІЯ

У дослідженні проаналізовано лікарські засоби, що використовуються для лікування синдрому вегетативної дисфункції, і проаналізовано споживчі властивості препаратів, які застосовуються у терапії вегетосудинної дистонії. Робота включає 40 сторінок тексту, 14 рисунків та список літературних джерел із 30 публікацій.

Ключові слова: ринок, лікарський препарат, вегетосудинна дистонія, терапія, маркетинговий аналіз, фармацевтичний ринок.

ANNOTATION

The study analyzed drugs used for the treatment of vegetative dysfunction syndrome, and analyzed the consumer properties of drugs used in the therapy of vegetative-vascular dystonia. The work includes 40 pages of text, 14 figures and a list of literary sources from 30 publications.

Key words: market, medicine, vegetative-vascular dystonia, therapy, marketing analysis, pharmaceutical market.

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INTRODUCTION

Relevance of the research topic. In any socio-economic and political conditions, people's health is an urgent state problem [3, 9]. According to statistical data, only 10-15% of people can be considered practically healthy, others have certain morphological and functional abnormalities, chronic diseases [7]. Dispensary observation in critical periods of pathogenetic progression, formal rehabilitation in the post-traumatic period, lead to a more severe course and earlier manifestation of neurological diseases [6].

The syndrome of autonomic dysfunction includes the manifestation of all forms of impaired autonomic regulation. The problem remains relevant, since the prevalence of vegetative dysfunctions is very significant and ranges from 29.1 to 82% in the population [1].

Pharmacotherapy of this nosology involves the use of a significant range of medicines from various clinical and pharmacological groups [2].

The modern pharmaceutical market of Ukraine is characterized by a steady growth of product nomenclature. This significantly increases the possibility of choosing the necessary medicines for the treatment of autonomic dysfunction syndrome in people, considering modern approaches to pharmacotherapy of various pathological conditions, individual characteristics of the course of diseases, consumer preferences of end users [17].

It is important to study the trends in the formation of the domestic pharmaceutical market by conducting marketing research on the range of drugs for the treatment of vegetative disorders in humans [22].

The purpose of the qualification work is the marketing analysis of the market of medicines used in the treatment of vascular dystonia.

To achieve the goal of the qualification work, it is necessary to solve the following **tasks**:

- to characterize the maladaptation of people under stress;
- to provide a description of vegetative-vascular dystonia;
- to investigate methods of treatment of vegetative-vascular dystonia;

- to characterize the medicines treatment of vegetative-vascular dystonia;
- to analyze the pharmaceutical market of medicines used in the treatment of autonomic dysfunction syndrome;
- to evaluate the consumer benefits of medicines used in the therapy of vegetative-vascular dystonia.

The object of the research is drugs used in the therapy of vegetative-vascular dystonia.

The subject of the research is the marketing analysis of the market of medicines used in the therapy of vegetative-vascular dystonia.

In our work, we used the following **research methods**: questionnaire, content analysis, graphic.

Practical significance of the obtained results. The use of the results of this study will allow effective management of the range of medicines used in the therapy of vegetative-vascular dystonia.

Approbation of research results and publication. The qualification work was tested on 4th international science and practice Internet conference "Problems and achievements of modern biotechnology". The summaries of the reports were published: Bondarieva I. V., Malyi V. V., Korjit Khaoula. Analysis of the medication market for vascular dystonia. Problems and achievements of modern biotechnology: materials of the 4th international science and practice. Internet conf. (March 22, 2024, Kharkiv). Electron. data. Kh.: National University of Pharmacy, 2024. – P. 15-16.

Structure and scope of qualification work. The qualification work consists of an introduction, a literature review, an experimental part, general conclusions, a list of used literary sources, and appendices. The qualification work is laid out on 40 pages, includes 14 figures, as well as 30 sources of literature.

PART I
THEORETICAL APPROACHES TO VEGETATIVE-VASCULAR DYSTONIA

1.1. Peculiarities of maladaptation of people under conditions of stress

During life, the body is repeatedly exposed to stressors of various nature, intensity and duration. The problem of children's stress is a particularly relevant issue. Thus, according to statistics, in 2023, the prevalence rate of nervous system diseases in children of the first years of life was 14 per 1,000 children under the age of 6, and among teenagers, this rate was 35 per 1,000 children of the corresponding age [1].

Doctors claim that long-term physical and psychological stress that exceeds the norm first causes functional disorders of individual organs, and then the formation of serious psychosomatic disorders in children. This happens due to depletion of the supply of various substances used by the body to adapt to the acting stress. In conditions of chronic stress, the child's body, which is still being formed, uses up its adaptive forces quite quickly. Disruption of neuro adaptation leads to an imbalance in the work of the nervous system, which regulates other functions of the entire body. That is why, in recent years, an increasingly large part of the medical community is interested in the issue of balanced functioning of the nervous system especially in childhood [5].

Before discussing what causes stress maladaptation, it is important to define what stress is and what it is like. Stress is a term used to describe a wide range of conditions that occur in response to various stimuli – stressors. It can be caused by external (for example, cold, overheating, excessive physical exertion) or internal (conflicts, fears or phobias) factors, the magnitude of which exceeds a certain limit [19].

The nervous system is the first to react to the constant influence of negative factors, and, accordingly, its breakdown occurs primarily due to the exhaustion of stress adaptation mechanisms [12].

Inability to focus on the process of activity, making a significant number of mistakes, memory impairment, overtiredness, fast pace of speech, lowering of the general emotional state, fixation, sleepiness, tearfulness – all this can be a manifestation of a child's maladjustment in conditions of stress [8].

Stress due to a combination of external influences is perceived by a person as excessive demands and creates a threat to self-respect, self-esteem, causing a corresponding emotional reaction, which is accompanied by a state of anxiety of varying intensity of manifestation. This especially applies to emotional reactions, as well as motor-behavioral and physiological processes in children [5].

Within the framework of maladaptation, somatic manifestations are possible, namely: arterial hypertension, tachycardia, vegetative-vascular dystonia, respiratory diseases [20].

There are several main approaches in the fight against disruption of neuroadaptation in children. Yes, you should not try to calm the child's feelings, especially with the help of expressions "don't worry, everything is fine, it's not scary". Such formulations can cause the child to worry that his feelings are abnormal and unnatural [7].

In addition, one may get the impression that the family does not understand him and do not share his feelings. It is important to make it clear that the child's feelings are normal and natural, and adults have also experienced something similar at one time. This can be achieved by talking, or you should make it clear that you are always there, love and support him [18].

It is important to adhere to the usual schedule of the day and not resort to changing the regime – this can cause the child's condition to worsen. It is also worth making sure that the child eats well and sleeps the appropriate number of hours [9].

In this aspect, products based on amino acids and plant components, which are specially designed as adaptogens to restore the normalization of the nervous system in children, may be of interest [4].

Getting a balanced amount of amino acids and vitamins to the brain is very important for its normal development and mental activity. The nervous system

physiologically does not synthesize a sufficient amount of substances necessary to withstand chronic stress, therefore constant nervous tension leads to the depletion of their reserves, and this requires their exogenous replenishment. Therefore, it is necessary to take an optimal combination of substances that would qualitatively and safely help fill the deficiency of substances involved in the mechanisms of adaptation of the child to stress [21].

The high pace of modern life requires a person to strain the adaptive mechanisms of the body, leads to frequent stress, contributes to the development of chronic fatigue syndrome, provokes the development of psychosomatic diseases, including bronchial asthma, stomach and duodenal ulcers, irritable bowel syndrome, arterial hypertension, and others [11].

All this requires timely and effective correction, most often – medication. However, most of the drugs indicated for such conditions belong to the prescription group, and patients can take them only on the recommendation of a doctor. Of course, when it comes to serious mental pathologies and conditions that require complex therapy with tranquilizers, strict control over medication leave is justified and absolutely necessary. But there are situations when scrupulous compliance with legal norms prevents quick and effective assistance to the patient. And then without the drugs Adaptol and Noofen produced by the company "Olainpharm", which are marketed on the pharmaceutical market by the company "Olfa" [7].

Adaptol and Noofen have a wide range of indications and can be prescribed for the prevention, correction and treatment of a number of psychosomatic conditions. At the same time, they are well tolerated and can be used in patients of any age, including children and the elderly. Both medicines are included in the list of medicines that are dispensed without a prescription from pharmacies and their structural divisions, approved by the Ministry of Health of Ukraine [3].

Adaptol belongs to the so-called daytime tranquilizers. The medicine has moderate tranquilizing activity, eliminates or reduces the severity of worry, anxiety, fear, internal emotional tension and irritability. At the same time, it does not cause muscle relaxation and impaired coordination of movements, does not affect mental

and physical performance, thanks to which it can be used during any type of activity. Although Adaptol does not have a hypnotic effect, it enhances the effect of hypnotics and improves sleep in case of sleep disorders. The medicine has extremely low toxicity, as it is close in chemical composition to the natural metabolites of the human body, does not cause addiction, liking, withdrawal syndrome; it has a favorable safety profile. Adaptol reduces the influence of the sympathetic division of the autonomic nervous system, which makes it indispensable in the treatment of vegetative-vascular dystonia, chronic fatigue syndrome, and premenstrual syndrome [4].

The antihypoxic and antioxidant properties of the medicine allow the medicine to be used for injuries, ischemic and hypoxic damage to organs and systems of various genesis. The adaptogenic effect of the medicine allows you to correct the state of the nervous system when the body's regulatory systems are weakened or disturbed, and protects against stress [14].

Indications for the use of medicine are quite broad – they are neuroses and neurosis-like conditions that occur with the phenomena of irritability, emotional instability, anxiety and fear. In the clinic of internal diseases, it is indicated for cardialgia of various genesis, which is not related to coronary heart disease. The medicine is also prescribed to improve the tolerability of antipsychotics and tranquilizers in order to eliminate the somatovegetative and neurological side effects that are caused. Since the active substance of medicine is practically chemically inert, it can be combined with any other medicinal products. In particular, Adaptol is used together with antipsychotics, tranquilizers (benzodiazepines), hypnotics, antidepressants, and psychostimulants in the complex therapy of various maladaptive conditions or in intoxication caused by these medicines [18].

An important property of medicine is the ability to eliminate or reduce the severity of nicotine withdrawal, as a result of which the medicine can be used to treat patients with nicotine addiction. Another drug from the over-the-counter group from the Olinepharm company that corrects psycho-emotional and vegetative spheres – Noofen – has a wider range of applications. It has a nootropic, anti-asthenic,

tranquilizing, neuroprotective and vegetostabilizing effect, and also has an analgesic effect. Noofen improves neurotransmitter transmission and functional characteristics of neurons, increases energy resources and activates metabolic processes, exhibits an antihypoxic effect, thanks to which it improves memory, increases learning ability, intellectual activity and resistance of the brain to harmful effects, stimulates physical activity. The activating effect of Noofen is especially pronounced in children and elderly patients. Noofen reduces the severity of asthenia and vasovegetative symptoms, including headache, sleep disturbances, irritability, and mood swings [11].

Due to the normalization of the work of the neurotransmitter system, Noofen has antiepileptic activity and is used in the complex therapy of epilepsy and epileptic equivalents, as well as parkinsonism [15].

The medicine is low-toxic, because its chemical structure is close to the natural neurotransmitter – aminobutyric acid, at the same time it does not affect choline and adrenergic receptors. The effect of using Noofen occurs within the first hours of administration, which allows it to be used for the prevention and treatment of sea and air sickness, stressful conditions before operations or painful diagnostic interventions [7].

1.2. Characteristics of vegetative-vascular dystonia

Vegetovascular dystonia, neurocirculatory dystonia, vegetative neurosis is a symptom complex that includes various clinical manifestations of various diseases and disorders [3]; a polyetiological syndrome characterized by dysfunction of the autonomic nervous system [19].

The term "vegetovascular dystonia" was proposed by Academician of Medical Sciences N.N. Savitsky in the late 1950s [3]. This term is absent from the International Classification of Diseases [4] adopted by the World Health Organization; however, in practice it continues to be used. A more correct name for part of the mental disorders related to vegetovascular dystonia is the name "somatoform autonomic dysfunction of the nervous system" [5] (the diagnosis of

somatoform autonomic dysfunction of the nervous system is present in the International Classification of Diseases under the code F45.3 [4]). In countries, the diagnosis of "vegetovascular dystonia" (in the sense that post-Soviet doctors have in mind) is not used [18].

The frequent use of the term "vegetovascular dystonia" by therapists, cardiologists and neurologists is due to the fact that such syndromic diagnoses are convenient, allowing not to waste time on diagnostic search for specific causes of the disorder; another reason for the frequent use of the term is the slow reconstruction of established stereotypes of clinical thinking. The term "neurocirculatory dystonia", which is also absent from the International Classification of Diseases and is also widely used by therapists, cardiologists, and neurologists, is close in meaning to the term "vegeto-vascular dystonia" [5]. Diagnoses of "vegeto-vascular dystonia" and "neurocirculatory dystonia" are often accompanied by inappropriate and ineffective treatment measures, which worsens the prognosis and quality of life of patients [4].

Usually, vegetative disorders related to the concept of vegetative-vascular dystonia are secondary and arise against the background of mental disorders or somatic diseases, with organic damage to the central nervous system, as a result of hormonal changes in adolescence, etc. In some cases, such autonomic disorders can be a component of endocrine disorders, hypertension, chronic coronary heart disease, a manifestation of anemia, systemic lupus erythematosus, coronary heart disease, mitral valve prolapse, etc. [3]; in cases where they are secondary to mental disorders, they can occur within somatoform (in particular, somatoform dysfunction of the autonomic nervous system), anxiety (in particular, panic disorder) and depressive disorders [2].

Various manifestations imitating the symptoms of various diseases are characteristic of vegetative-vascular dystonia. Symptoms may occur from the nervous system, cardiovascular, respiratory, genitourinary, gastrointestinal tract, thermoregulation, and sweating. General vegetative symptoms such as slightly elevated temperature, asthenia, vegetative paroxysms, muscle-tonic disorders,

cramp syndrome, painful muscle tension, paresthesias, numbness, itching, burning in various parts of the body, anxiety, restlessness, irritation are possible. A change of one symptom to another can be observed, there are often cases of comorbidity of various functional syndromes. Some patients experience pain in different parts of the body [8].

The leading symptom of VSD in terms of frequency and significance is headache, which is often the main manifestation of this disorder [2]. Treatment of disorders combined with the concept of "vegetative vascular dystonia" should depend on the causes that caused vegetative dysfunction (either a somatic disease or a mental disorder) [1].

In addition, constant moderate physical activity that strengthens the cardiovascular system, but does not lead to physical stress, and avoidance of stressful situations that lead to emotional stress can be recommended [1].

CONCLUSIONS TO PART 1

1. The maladaptation of people under stress conditions is characterized.
2. A description of vegetative-vascular dystonia is given.

PART II
PECULIARITIES OF TREATMENT OF VEGETATIVE-VASCULAR DYSTONIA

2.1. Methods of treatment of vegetative-vascular dystonia

Vegeto-vascular dystonia is a functional disorder of the nervous system, which is characterized by a violation of the general condition and well-being, manifested by inorganic malfunctions in the work of various organs and systems [3].

In many medical publications, you can find other names for this disease, namely: autonomic dysfunction, neurocirculatory dystonia, cardiac neurosis, functional cardiopathy, psychovegetative syndrome, panic attack, angioneurosis, psychovegetative neurosis, vasomotor dystonia, etc. [7].

There is an opinion that vegetative-vascular dystonia is not an independent disease, but a syndrome, that is, a consequence of any disorder, from simple overwork to diseases that require treatment. That is why they say that one of the surest ways to treat dystonia is to find and eliminate its cause. But all the luminaries of the medical world are unanimous in the fact that dystonia is undoubtedly a pathological condition of the body that occurs due to a malfunction of our autonomic nervous system [3].

VD occurs quite often – both in children (12-25%), and in adults (up to 70%). As a result of the increasing modern pace of life, which requires the full return of internal resources and forces in the process of study and work, stressful situations intensify. In addition, VD can develop due to acute and chronic diseases, lack of sleep, improper lifestyle and diet [5].

Medical literature currently lacks clear criteria for the terminology, pathogenesis, classification, diagnosis, and treatment of autonomic disorders, and their place in a number of pathological conditions is not defined. In the current international classification of diseases of the 10th revision, references to autonomic disorders appear in various headings [8].

According to numerous epidemiological studies, autonomic disorders in the population, starting from puberty, occur in 25–80% of cases. The large range of revealed data on the spread of vegetative pathology is explained by the ambiguity of the methodical approach, taking into account either all or only sufficiently pronounced disorders. However, the prevalence of autonomic dysfunction is evident, even among individuals who consider themselves to be practically healthy. Moreover, there are no such pathological conditions in the development and course of which vegetative mechanisms are not involved. In some cases, it plays a key role in pathogenesis, and in others, it occurs secondarily in response to damage to certain body systems and tissues. Another feature of vegetative pathology is that it is extremely rare as an independent species. As a rule, autonomic disorders are secondary, arising against the background of many mental, neurological and somatic diseases [8].

There are no detailed and complete classifications of vegetative disorders in the world and domestic literature. In particular, A. M. Wein's classification of vegetative disorders is based on the principle of dividing the pathology of suprasegmental and segmental disorders, as well as their primary and secondary. Peripheral autonomic disorders arise as a result of damage to peripheral autonomic structures that are part of the sympathetic or parasympathetic nervous system. They are manifested by dysfunction of visceral systems (peripheral vegetative insufficiency syndrome) or vegetative-trophic disorders. Central autonomic disorders are associated with dysfunction of central (suprasegmental) integrative structures: trunk, midbrain, limbic system, large hemispheres. Vegetative disorders of central genesis are often accompanied by polymorphic mental (psychovegetative syndrome) and endocrine-metabolic disorders. It is extremely rare to be able to analyze the nosological essence of the pathology of vegetative dysfunction, which leads to the impossibility of establishing the correct diagnosis and treatment. Primary autonomic disorders are mostly associated with selective damage to autonomic structures, as well as caused by hereditary diseases or acquired conditions of degenerative or autoimmune genesis, in which case autonomic dysfunction

dominates the clinical picture and manifests itself in the early stages of the disease. Secondary vegetative disorders are most often complications of other neurological, mental or somatic diseases that occur at later stages [9].

There is another working, according to which autonomic disorders are divided by etiology, clinical syndromes, and degrees of severity. Etiological forms include constitutional-hereditary, psychogenic (neurotic), infectious-toxic, associated with physical stress, and those caused by physical and professional factors. Clinical syndromes include: cardiac, tachycardiac, hypertensive, hypotensive, peripheral vascular disorders, vegetative crises, respiratory and asthenic syndromes, as well as myocardial dystrophy; and according to the severity of the condition – mild, medium and severe course of the disease [30].

Over the last decade, a significant increase in the incidence of mental and behavioral disorders, in particular psychological, so-called borderline conditions have appeared. At the same time, there is a significant increase in indicators for all main classes of psychosomatic diseases: hypertension, coronary heart disease, cerebrovascular diseases, gastric and duodenal ulcers, etc. [4].

The symptoms of vegetative-vascular dystonia are related to the violation of regulatory functions and the harmonious interaction of two departments of the vegetative nervous system, and not to the pathology of any internal organ. This means that the patient has subjective complaints about the work of various organs that imitate one or another disease, but in fact no pathology is detected, since the clinical symptoms are associated with an imbalance of the nervous system. Isolated vegetative insufficiency is manifested in middle-aged people mainly by progressive orthostatic hypotension, but at the same time, the regulation of not only vascular tone, but also the gastrointestinal tract and sweat glands is disturbed [27].

The basis of the pathogenesis of autonomic dysfunction, as was mentioned, is a violation of the integrative activity of suprasegmental autonomic structures. The main factors determining its development include: hereditary (constitutional) predisposition; endocrine changes in the body (pubertal and climacteric periods); somatic diseases, stress, neuroses, psycho-emotional tension; organic lesions of the

brain involving diencephalic structures (injuries, tumors, impaired cerebral circulation, neuroinfections), etc. Hereditary and constitutional factors can cause the appearance of vegetative dysfunction in early childhood ("vegetatively stigmatized children") [1].

It is known that increasing the effects of one of the departments of the autonomic nervous system leads to compensatory tension in the regulatory mechanisms of the other. In a state of overstrain, there is a disruption of adaptation, the regulatory function is disrupted, and the increase in activity of one department does not lead to corresponding changes on the part of another, which is clinically manifested by symptoms of autonomic dysfunction [2].

The diagnosis of vegetative-vascular dystonia is established on the basis of subjective and objective signs of impaired activity of the vegetative department of the nervous system, in particular, in the presence of "specific" and characteristic complaints of the patient, but symptoms of organic damage to the nervous system are not observed. One should also take into account the objective manifestations of vegetative dysfunctions, namely the dermographic reaction; the nature of sweating; pulse, blood pressure; frequency, depth and rhythm of breathing; the presence of tremors of the eyelids, fingers; clarity of speech; revitalization of tendon reflexes; mild changes in muscle tone [3].

Taking into account the current classification systems, the syndrome of autonomic dysfunction unites, on the one hand, vivid autonomic crises, prolonged subfebrility, neurogenic syncope, and on the other hand, vascular-trophic local syndromes, orthostatic hypotension, anhydron, neurogenic bladder.

In this way, three generalized syndromes were distinguished. The first is psychovegetative, which is characterized by permanent paroxysmal disorders caused by dysfunction of non-specific brain systems. The second is a syndrome of progressive vegetative insufficiency, the main manifestations of which are unconscious states in the picture of orthostatic hypotension, impotence, arterial hypertension in a horizontal position, the symptom of "fixed pulse", weight loss, urinary incontinence, constipation, dysarthria, angina pectoris. This syndrome

occurs much less often than the psychovegetative syndrome, and it is currently being actively researched.

The third is a syndrome of vegetative-vascular-trophic disorders, which is caused by damage to the nerves, plexuses and roots that innervate the upper and lower limbs (for example, Raynaud's syndrome, tunnel syndromes or vegetative disorders in neural amyotrophies).

There are 40 different symptoms of VSD. Very often, the variety of complaints, their different expressiveness and stability create the impression of different diseases that have manifested themselves at the same time. It is characteristic of vegetative-vascular dystonia that subjective feelings significantly prevail over objective indicators of the state of health.

Basically, the number of manifestations of VD varies from 9 to 26. The problem for the doctor is that most often patients cannot clearly tell about their feelings. The patient's main complaints are that he is "unwell", he feels "weakness", "passes out" sometimes or constantly due to emotions, fatigue, "weather". Sometimes there is a feeling of a "heavy, not your own" head, numbness, chills, tingling in the limbs.

But still, it is possible to single out those symptoms that are most characteristic of VD. No symptom alone indicates vegetative-vascular dystonia. You can talk about it when there are several of them at the same time and there are no signs of organic disorders. So, do not try to diagnose yourself by ticking the boxes that you observe in yourself.

Based on statistical data, the most common symptoms of VD can be ranked in the following order:

- heartache;
- weakness and quick fatigue;
- neurotic disorders (irritability, anxiety, worry, low mood);
- headache;
- respiratory disorders (dissatisfaction with breathing, feeling of lack of air, need to take deep breaths);

• heartbeat;

• coldness of the hands, feet, paresthesia (numbness, tingling) of the extremities;

• sleep disturbance;

• dizziness, darkening in one's own eyes;

• hand tremors, a feeling of internal trembling;

• cardiophobia (fear of "stopping" the heart);

• sense of decoration;

• stomach ache;

• joint pain, myalgia, neuralgia;

• shortness of breath when walking fast;

• swelling of the face, eyelids in the morning;

• interruptions and heart failure;

• nausea;

• feeling of pulsation of the vessels of the neck and head;

• feeling of heat in the face, neck;

• impotence;

• low fever (body temperature from 37 to 37.5°C without cold symptoms);

• fainting;

• dysmenorrhea.

In order for dystonia not to become a life-long curse, it is necessary to learn to enjoy life. There are the following recommendations:

1. Adherence to the daily regime at VD. You need to sleep at least 8-10 hours a day. And the more, the better. A sound, restful sleep greatly contributes to the normalization of blood pressure. The bedroom should not be hot or stuffy. Do not rest on too soft or hard mattresses and pillows. It is better to sleep on orthopedic mattresses and pillows that promote the most physiological position of the body and head. Alternate mental and physical activity. Try to reduce the time spent watching TV programs and working at the computer. In the absence of such an opportunity, mandatory preventive breaks when working with a computer, eye exercises, etc.

Make it a rule to spend at least an hour a day (and preferably two hours) in the fresh air [11].

2. Playing sports in a game-like, non-normative mode. No one is urging you to dedicate your life to sports. But such simple joys as skating in the winter and cycling in the summer, swimming, walking, aerobics, light gymnastics will imperceptibly drive dystonia so far that a person will forget what it is. Among exercise machines, it is best to use a treadmill, a stepper, and a rowing machine. Exercises on simulators where the head is below chest level and exercises are performed upside down are contraindicated (since there is a great danger of worsening health and even fainting). Oriental martial arts, strength gymnastics, bodybuilding, aerobics with high jumps are not recommended, as they put a significant load on the cardiovascular system. Exercises with a large amplitude of movement of the head and trunk, movements that are performed sharply and quickly should be avoided. Do it with pleasure. The main criterion is your well-being. Do not forget that you enjoy life, your body, get pleasant emotions from increased blood flow and muscle strengthening [22].

3. Adherence to a certain diet. Excess weight, as well as hypodynamism, is one of the significant risk factors for increasing the VD-syndrome. Nutritional recommendations are covered in more detail in the appropriate section, and here we will leave a "reminder cheat sheet": limit the consumption of table salt, fatty types of meat, sweets, and flour. It is necessary to increase the intake of potassium and magnesium in the body (buckwheat, oatmeal, soybeans, beans, peas, apricots, rose hips, dried apricots, raisins, carrots, eggplants, onions, lettuce, parsley, nuts) [3].

4. Water and physical procedures: electrophoresis, electrosleep, water procedures, sun and air baths - in short, everything that stimulates the nervous system. Any hardening procedures are especially useful, just keep in mind that dousing and wiping should be started very carefully so that the body does not go into shock. Contrast baths, fan and circular showers, hydromassage are recommended for all types of vegetative-vascular dystonia. In addition, pine-salt and radon baths are

used for the parasympathetic type of vegetative-vascular dystonia, and carbon dioxide, chloride and sulfide baths for the sympathetic type.

5. Acupuncture and therapeutic massage: with parasympathetic tonic type of VD – surface massage at a fast pace, rubbing, vibration massage. With sympathicotonic type – soothing massage at a slow pace, kneading the collarbone area. In case of mixed type of vegetative disorders, the combination of these massage techniques.

6. Phytotherapy. For disorders of the parasympathetic type, herbal stimulants (ginseng, aralia, leuzea), various diuretic herbs and collections (juniper, lingonberry) are used. In disorders of the sympathicotonic and mixed types – soothing herbs and collections (valerian, nettle, sage, mint, lemon balm, hops, peony root).

7. Psychological correction. It is good to use various methods of psychological relief, self-training. Willpower and desire for a healthy and fulfilling life is one of the most important factors in clearly defeating dystonia! By the way, it is known that dystonia is closely related to the type of temperament. Self-training classes, knowledge of relaxation methods, as well as various psycho-training sessions will help [15].

It has been proven that with timely treatment and regular correction of autonomic disorders, sleep and appetite normalize in 80-90% of patients, complaints and manifestations of dystonia completely disappear or are significantly reduced, and the adaptive capabilities of the body are restored.

2.2. Medicinal treatment of vegetative-vascular dystonia

Since it is dangerous to engage in self-medication, we have studied the medicines that are used in the medical treatment of dystonia. It should be noted that in practice, treatment is primarily aimed at the main disease. The doctor can also apply pathogenetic therapy (sedatives; if necessary, cholinolytics, adrenoceptor blockers) and apply symptomatic medicines — hypotensive, antiarrhythmic, etc. [1].

Sometimes a course of vitamins and sedatives (novopasit, glycine, centrum) is prescribed. In all cases, the emphasis should first of all be not on suppressing

symptoms, but on normalizing the daily routine and improving lifestyle. In case of an adrenergic crisis, beta-adrenergic blockers (for example, Inderal inside) are indicated, and alpha-adrenergic blockers (phentolamine, tropafen) may also be prescribed with a pronounced increase in pressure. In case of a cholinergic crisis, atropine is administered subcutaneously, and in case of a concomitant sharp rise in pressure, gangleron is administered. In some cases, the doctor may consider it necessary to prescribe antidepressants, as well as tonics [3].

Many people think that dystonia and pregnancy are a terrible mixture, which will definitely affect the health of the child and the condition of the future mother. A mother diagnosed with VD and a child in the womb are at risk, as the course of pregnancy may be complicated.

It is possible to completely prevent or reduce the complications of pregnancy (including early toxicosis, etc.) if you undergo a thorough medical examination in a hospital in advance (before conception) and correct the condition. After all, dystonia and pregnancy can in principle coexist, if you know some nuances. Dystonia of the hypotonic type with constant low pressure can cause a lack of oxygen and a lack of useful substances in the child. Dizziness and frequent pains in the head area negatively affect the general condition of the expectant mother. It is difficult to overcome such conditions, but it is possible, especially if you turn to qualified specialists who deal with the problems of vegetative-vascular dystonia. But the main rules that must be followed in case of dystonia and pregnancy will be:

• drawing up a routine and strictly following it;

• walks as often as possible and simple physical exercises allowed during pregnancy;

• hardening (only, of course, according to all the rules);

• light massage of the collar zone directly and generally strengthening;

• use of means with a calming effect (relaxing music, aromatic baths, herbal teas);

• do nothing on your own. Do not prescribe any medication;

• be kind to yourself and not be afraid of anything;

• follow other recommendations for dystonia and pregnancy given by the doctor.

It is interesting that women who were not afraid to get pregnant with a diagnosis of vegeto-vascular dystonia syndrome note that their condition improved significantly during pregnancy and after its birth, and some even completely got rid of the symptoms of dystonia. After all, it is believed that during pregnancy, the body (as a smart machine) mobilizes all its abilities and begins to adjust itself to work in the correct mode. In addition, as is known, the dystonia syndrome appears and becomes more active during an unstable psychological state, constant stressful situations and other troubles. So, if you can manage yourself, protect yourself from bad experiences or, even better, turn them into something positive, you can improve the situation with dystonia and pregnancy. The most important thing is to set yourself up correctly, try to spend time in a relaxed and happy state. After all, pregnancy is great, and the fact that this can happen only to women has a wonderful effect, mostly, on a woman's appearance and on her inner feelings [19].

This is what will really help with dystonia and pregnancy — these are the principles of positive thinking. Never think about the bad, always only about the good and try to surround yourself only with good people and other pleasant things. The main thing is to stop being afraid. For myself, for the child, for the end of the world. It is necessary to learn to relax the muscles, to release them from excessive tension. In order to overcome dystonia and fears, which are the result of attacks and are called panic attacks, you need to constantly remind yourself that there is nothing really terrible in panic attacks, their onset will not affect either the health of the mother or the health of the child. This is simply a process in which adrenaline is released, and unpleasant sensations are a normal (so to speak) reaction to this manifestation.

Due to the variety of symptoms of VD, the pharmacological spectrum of the medicines used is quite wide. However, the simultaneous appointment of a large number of medicines can harm the patient, therefore, for each patient, a personalized

medication program is developed in a certain sequence, which is adjusted in the course of treatment.

One of the complex medicines created on the basis of plant raw materials and a component with a metabolic effect is the medicine Kratal. One tablet of the drug Kratal contains 43 mg of thick extract of hawthorn fruits, 87 mg of thick extract of nettle and 867 mg of taurine.

During experimental and clinical studies, it was established that the specified agent has a mild cardiotonic, antianginal, antioxidant, antiarrhythmic, antihypoxic, antiaggregant and antiatherogenic effect. The complex of biologically active substances in the composition of the medicine Kratal contributes to the synergism of the therapeutic effect of its individual components, which creates wide opportunities for use. On the basis of which, the specified agent can be classified as a group of cytoprotectors, which have an active effect on disturbed metabolic processes in the human body.

Taurine is a non-protein sulfur-containing η-amino acid, which is primarily involved in metabolic processes of carbohydrate and protein metabolism, regulation of cellular metabolism, neuromodulation, vasodilatation, cardiac activity, learning and memory processes, and has antiatherogenic and hypotensive effects. It protects various organs from damage, in particular with psychological and oxidative stress, provides a cardioprotective effect. Its neuroprotective effect is manifested in the improvement of cerebral blood circulation, cognitive functions, elimination of neurotic symptoms and somatovegetative disorders.

In addition, taurine has demonstrated powerful cytoprotective properties, it regulates phospholipid metabolism and directly affects membrane stability. Increases the biotransformation of cholesterol into bile acids, which, in turn, can enhance the removal of cholesterol from the body. Thanks to its antioxidant effect, taurine can reduce the oxidation of low-density lipoproteins and weaken the process of atherosclerosis.

Hawthorn (the second component of the medicine Kratal) is considered one of the best cardiotonics, it expands peripheral and coronary vessels, improves blood

supply and metabolism of the myocardium, thus exerts a cardioprotective, hypotensive and hypocholesterolemic effect, eliminates pain and a feeling of heaviness in the heart, calms the nervous system.

A thick extract of nettle (the third component of the medicine Kratal) mildly suppresses the nervous system and restores the heart rhythm, increases the strength of heart contractions, has a calming effect, lowers blood pressure, has an antispasmodic, anticonvulsant and mild diuretic effect due to the presence of alkaloids in its chemical composition, essential oils, organic acids (malic, tartaric, citric, etc.), flavonoids, glycosides, sugary substances, vitamins (E, C, carotene — the precursor of vitamin A) and minerals. The results of the research proved that the medicine is well tolerated, does not have a toxic effect, does not cause allergic reactions and is an effective and safe remedy for the treatment of various types of vegetative disorders.

In the complex treatment of patients with vegetative dysfunction, the medicine improves their clinical condition, quickly and effectively eliminates its main manifestations: significantly reduces the severity of cardiac (palpitations) and abdominal syndrome, reduces the manifestations of neurovascular syndrome (headache, dizziness), regresses the manifestations of maladaptation (normalizes sleep, reduces weather sensitivity, irritability, emotional lability, fatigue).

The specified properties of the medicine, convenience of administration and minor side effects have provided it with a high level of trust of patients.

CONCLUSIONS TO PART 2

1. Methods of treatment of vegetative-vascular dystonia have been studied.
2. Medical treatment of vegetative-vascular dystonia is characterized.

PART III
MARKETING ANALYSIS OF THE MARKET OF MEDICINES USED IN THE THERAPY OF VEGETATIVE-VASCULAR DYSTONIA

3.1. Analysis of the pharmaceutical market of medicines used in the treatment of autonomic dysfunction syndrome

Marketing studies of the domestic market of medicines used in the therapy of vegetative-vascular dystonia have been conducted. The results of the content analysis showed that 1,198 medicinal products are registered on the Ukrainian pharmaceutical market. The structure of medicinal products by producing countries, origin, composition, forms of release was studied. The main indicators and trends in the development of the range of medicinal products have been established.

The information array of medicines consisted of 1198 medicines, 121 trade names and 31 international non-proprietary names of medicines from 5 classification groups.

In the course of the marketing research, the structure of the assortment was determined, which is formed by 5 classification groups of medicines used for the treatment of VD according to the ATC classification.

It was revealed that the leading position is occupied by group N "Medicines for the treatment of diseases of the nervous system" – 59%, the second position – group C "Medicines for the treatment of diseases of the cardiovascular system" – 19%, the third position – drugs of group A "Medicines affecting on the digestive tract and metabolism", which account for 7% of the total volume of the assortment (Fig. 3.1).

Other drugs make up 15% of medicines used for the treatment of autonomic dysfunction syndrome (Fig. 3.1).

As a result of a detailed intragroup analysis of group N – "Medicines for the treatment of diseases of the nervous system", it was established that it is formed by 6 subgroups of medicines.

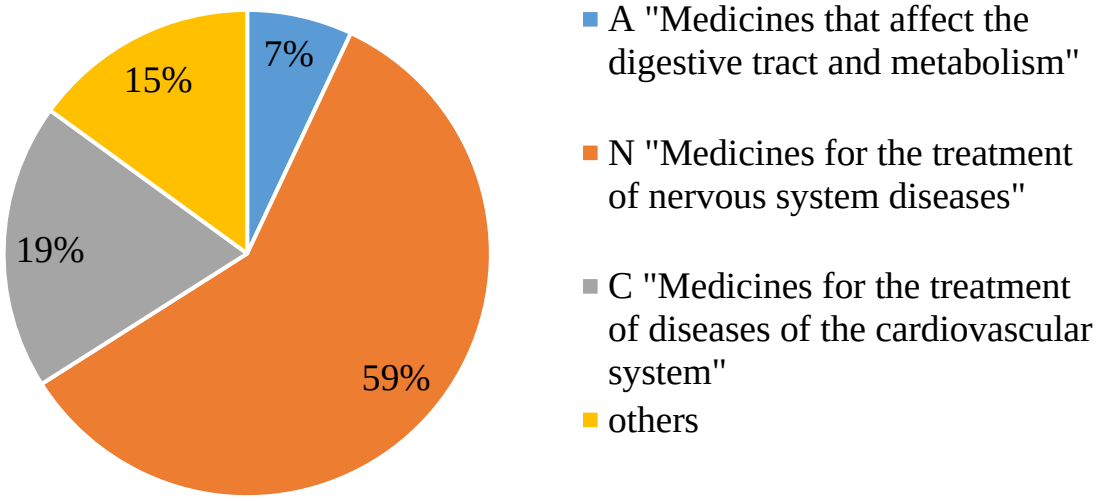

Fig. 3.1. The structure of the assortment of medicines for the treatment of VD by leading groups according to the ATC classification

It was established that the leading position is occupied by group N06B "Psychostimulants and nootropics" – 64%. In second place is group N05C "Sedatives" – 15%. The third position is occupied by group N06A "Antidepressants" – 11%, others – 11% of medicines (Fig. 3.2).

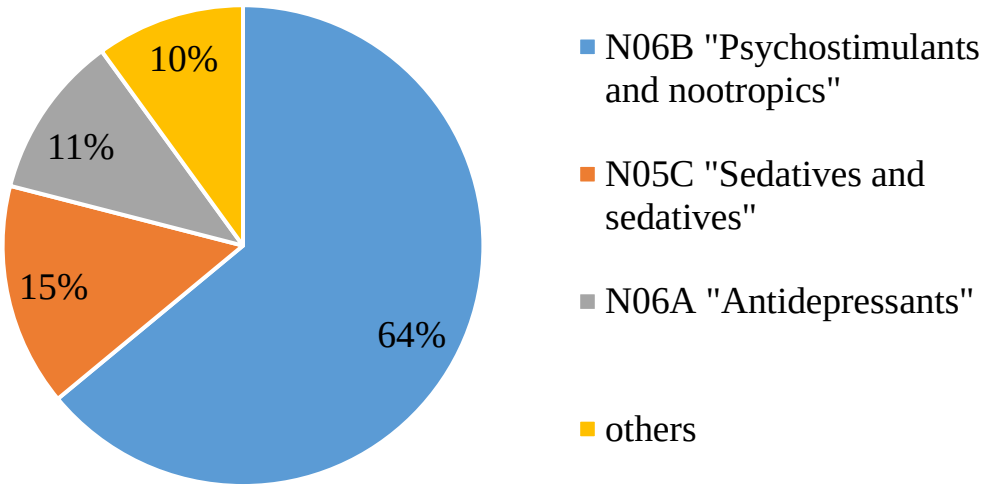

Fig. 3.2. Analysis of group N – "Medicines for the treatment of diseases of the nervous system"

Further, we conducted a segmentation analysis based on the production feature, which showed the predominance of the share of medicines of domestic production – 67%, the remaining 33% – foreign medicines (Fig. 3.3).

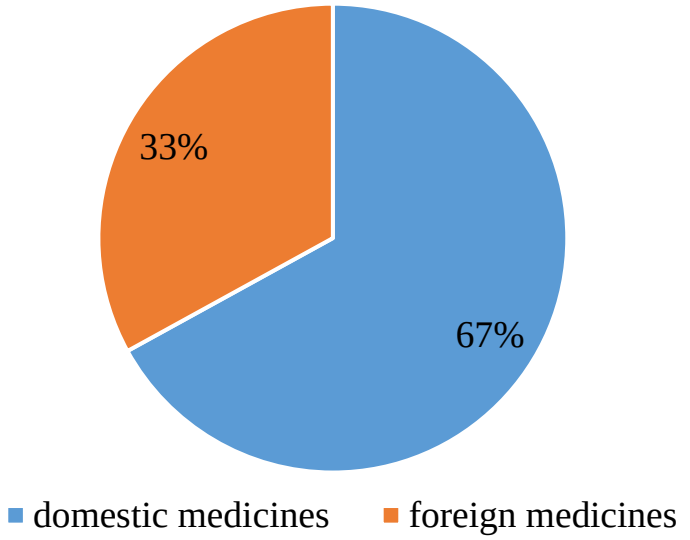

Fig. 3.3. Analysis of manufacturers of medicines for the treatment of autonomic dysfunction syndrome

It was established that the market of medicines for the treatment of autonomic dysfunction syndrome is represented by medicines from 18 producing countries. It has been established that the leaders in the production of medicines used for autonomic dysfunction syndrome are: Ukraine – 61%, India – 13%, Germany – 4% (Fig. 3.4).

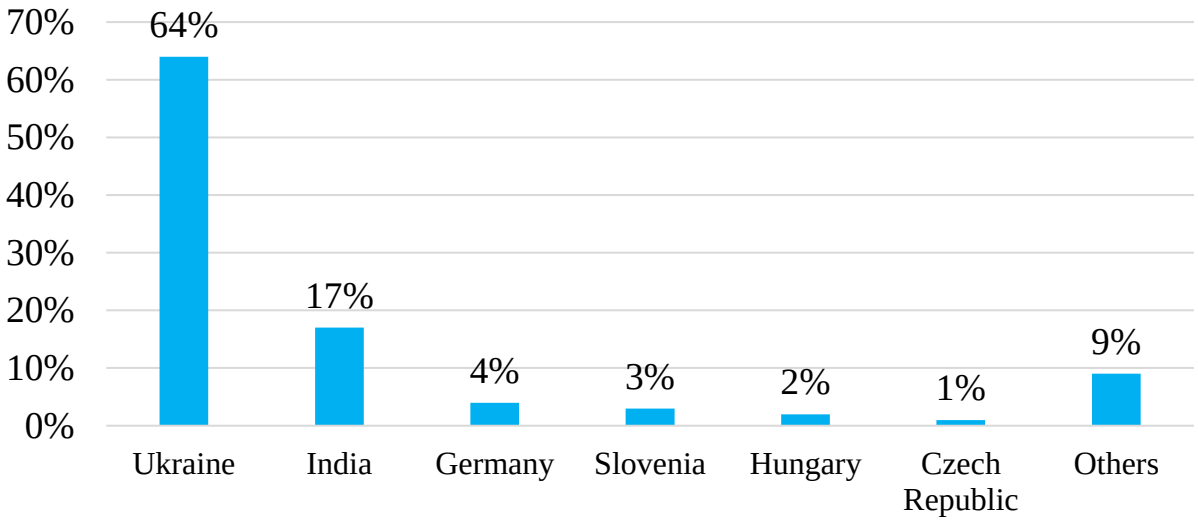

Fig. 3.4. Analysis of producing countries medicines for the treatment of VD

It was found that Slovenia holds a share of 3% of medicines for the treatment of autonomic dysfunction syndrome, Hungary – 2%, the Czech Republic – 1%, others – 9% (Fig. 3.4).

In the range of medicines for the treatment of autonomic dysfunction syndrome, mono component and combined medicines of complex composition were found. It was found that in the overall structure, the dominant part belongs to mono component medicinal products, which is 98.0%, combined – 2%, respectively (Fig. 3.5).

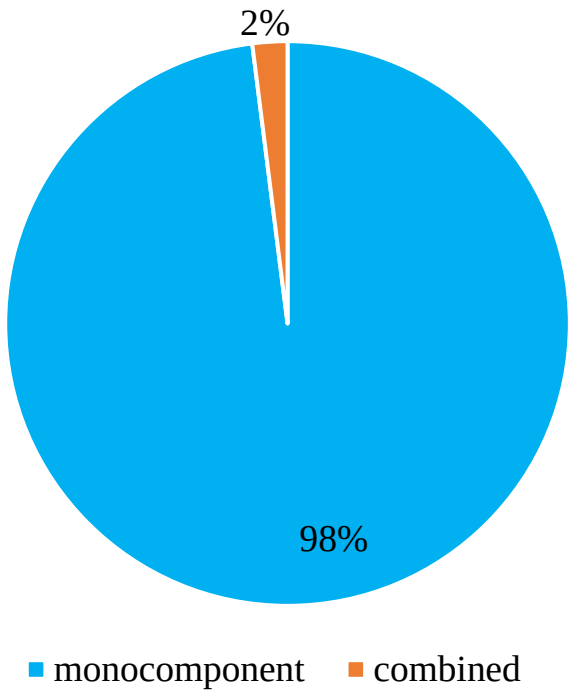

Fig. 3.5. Analysis range of medicines for the treatment of autonomic dysfunction syndrome

Medicines for the treatment of autonomic dysfunction syndrome are available in various dosage forms (Fig. 3.6).

The segmentation of the assortment by type of dosage form revealed that the share of solid forms for the treatment of autonomic dysfunction syndrome in the overall structure of the assortment is 85%, liquid forms – 14%, and soft forms – 1% (Fig. 3.6).

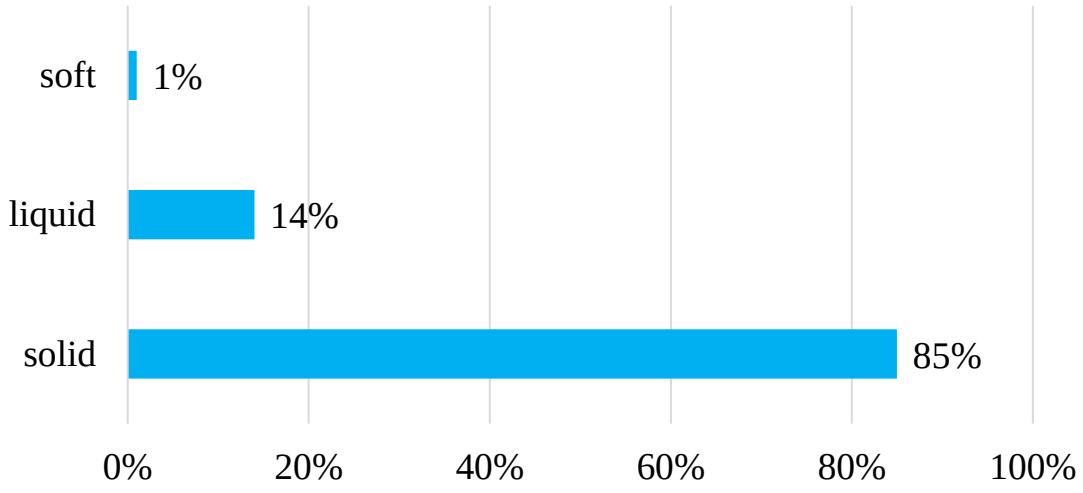

Fig. 3.6. Analysis medicinal forms medicines for the treatment of autonomic dysfunction syndrome

It was found that the largest specific weight in the total nomenclature is occupied by solid dosage forms: tablets – 513 medicines (51%), coated tablets – 207 medicines (21%), film-coated tablets – 128 medicines (13%), specific weight other solid medicinal forms – 15% (172 medicinal products) (Fig. 3.7).

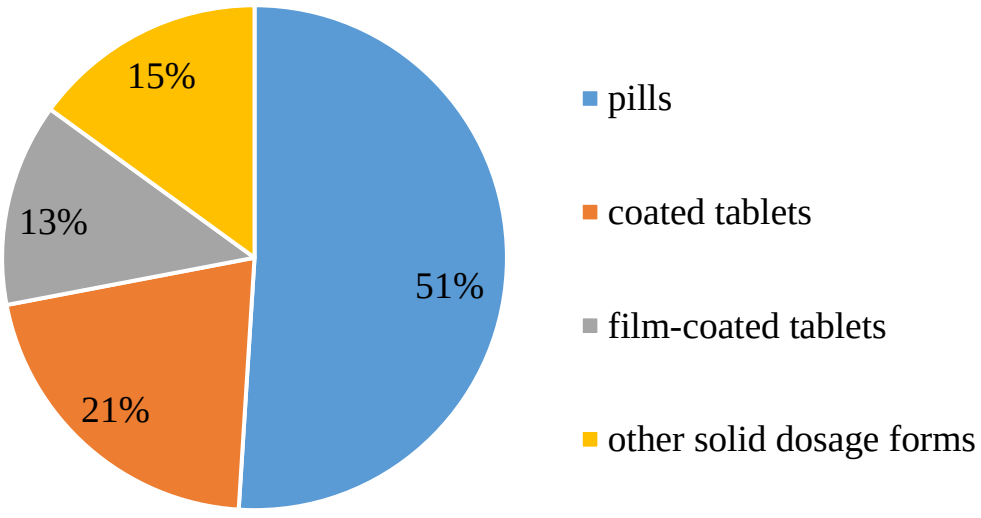

Fig. 3.7. Analysis of solid dosage forms of medicines for the treatment of autonomic dysfunction syndrome

Further, an analysis of the registration of medicinal products was carried out, which made it possible to establish that 497 medicines for the treatment of autonomic dysfunction syndrome were registered on the Ukrainian market for the studied years of 2018-2020. The renewal of the assortment was 41.4%, which indicates favorable trends in the development of this segment.

As a result of the analysis, an assortment macrocontour of the market of medicines used for the treatment of autonomic dysfunction syndrome was formed, which is mainly represented by medicines for the treatment of diseases of the nervous system (59%), the leading place among which is occupied by psychostimulants and nootropics (64%).

According to the production feature, medicines of domestic production prevail (67%). The range under study in 85% of cases is represented by solid dosage forms, mainly in the form of tablets (51%). The overall structure of the market is dominated by monopreparations (98%). The update is 41.4% (Fig. 3.8).

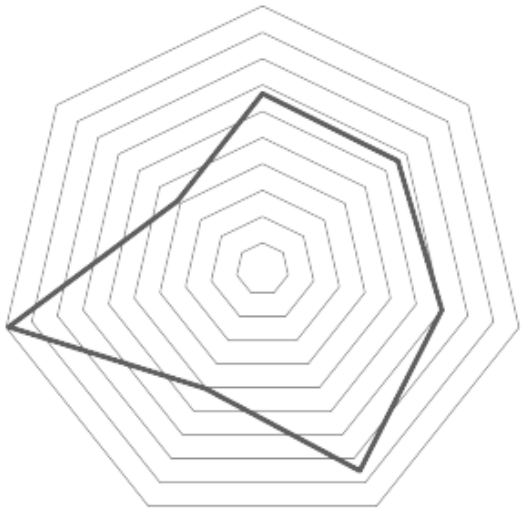

Fig. 3.8. Analysis assortment macrocontour of the pharmaceutical market of medicines used in the treatment of autonomic dysfunction syndrome

The domestic pharmaceutical market offers the target segment of consumers a significant range of medicines for the treatment of autonomic dysfunction syndrome. It mainly contains drugs of domestic production, in various price categories.

3.1. Evaluation of consumer benefits of medicines used in the therapy of vegetative-vascular dystonia

In order to assess the consumer benefits of drugs used in the therapy of vegetative-vascular dystonia, marketing research was conducted on 50 consumers. It was found that 85% of women participated in the study and 15% of men. It was established that doctors most often prescribe and advise pharmacists to purchase imported medicines (73%) and only 27% – domestic medicines (Fig. 3.9).

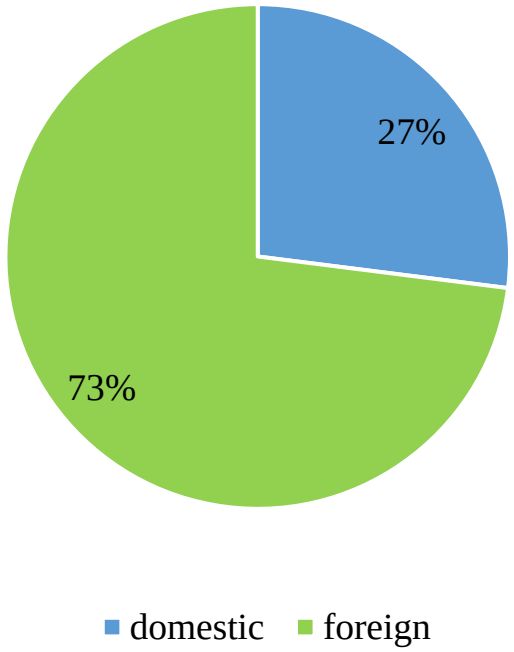

Fig. 3.9. Analysis of medicines most often prescribed by doctors by country of origin

Information about the originality of medicines prescribed by doctors for the treatment of VD was of interest (Fig. 3.10).

It was found that 37% assign brands to visitors; 23% – generic medicines and 40% – brand and generic medicines are prescribed with the same frequency (Fig. 3.10).

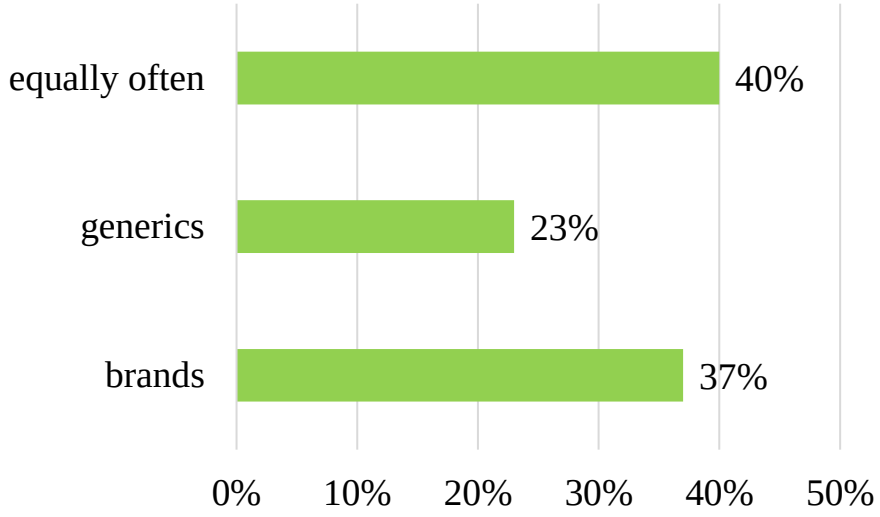

Fig. 3.10. Analysis of medicines for the treatment of VD, which are most often prescribed by doctors based on the criterion of originality

In the course of the work, factors affecting the choice of the medicine for the treatment of vegetative-vascular dystonia were highlighted (Fig. 3.11). It was found that for 34% of consumers, the main thing when choosing a medicine for the treatment of VD is the doctor's recommendation; for 25% – efficiency; for 22% of consumers – the price of medicine and for 12% – safety and for 7% – advertising in mass media (Fig. 3.11).

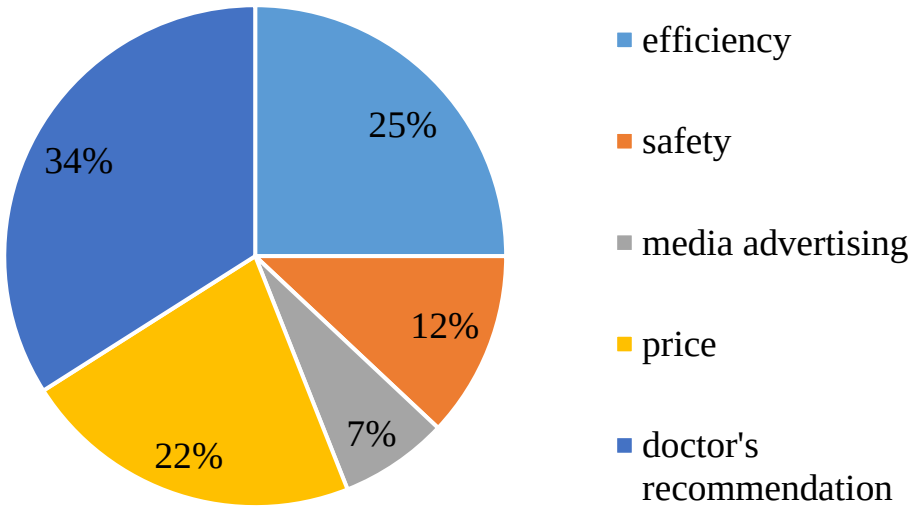

Fig. 3.11. Analysis of influencing factors on the choice of medicine users for the treatment of vegetative-vascular dystonia

Pharmaceutical forms of medicines for the treatment of VD, which were most often used by consumers, were analyzed (Fig. 3.12).

It was found that 72% of the respondents chose tablets, 14% – solution for injections, 5% – capsules, 4% – powder for preparation of solution for injections; 3% – oral solution, 2% – oral drops.

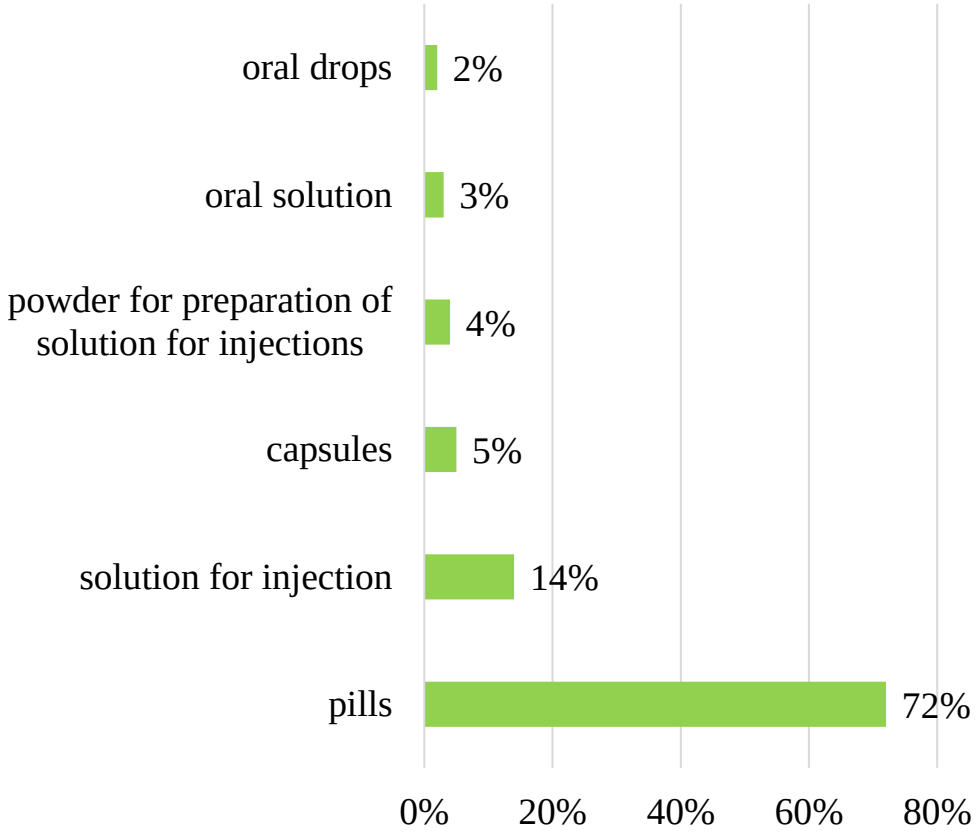

Fig. 3.12. Analysis dosage forms of medicines for the treatment of VD, which were most often used by consumers

Next, we analyzed the main active substances in the medicines that consumers use for the treatment of vegetative-vascular dystonia (Fig. 3.13).

It was found that Piracetam is used by 28% of consumers, Betahistine – 22%, Risperidone – 18%, Meldonium – 12%, Ethyl methylhydroxypyridine succinate – 8%, Phenibut – 3%, Phenobarbital – 3%, Hydazepam – 3%, Doxylamine – 2%, others – 1% (Fig. 3.13).

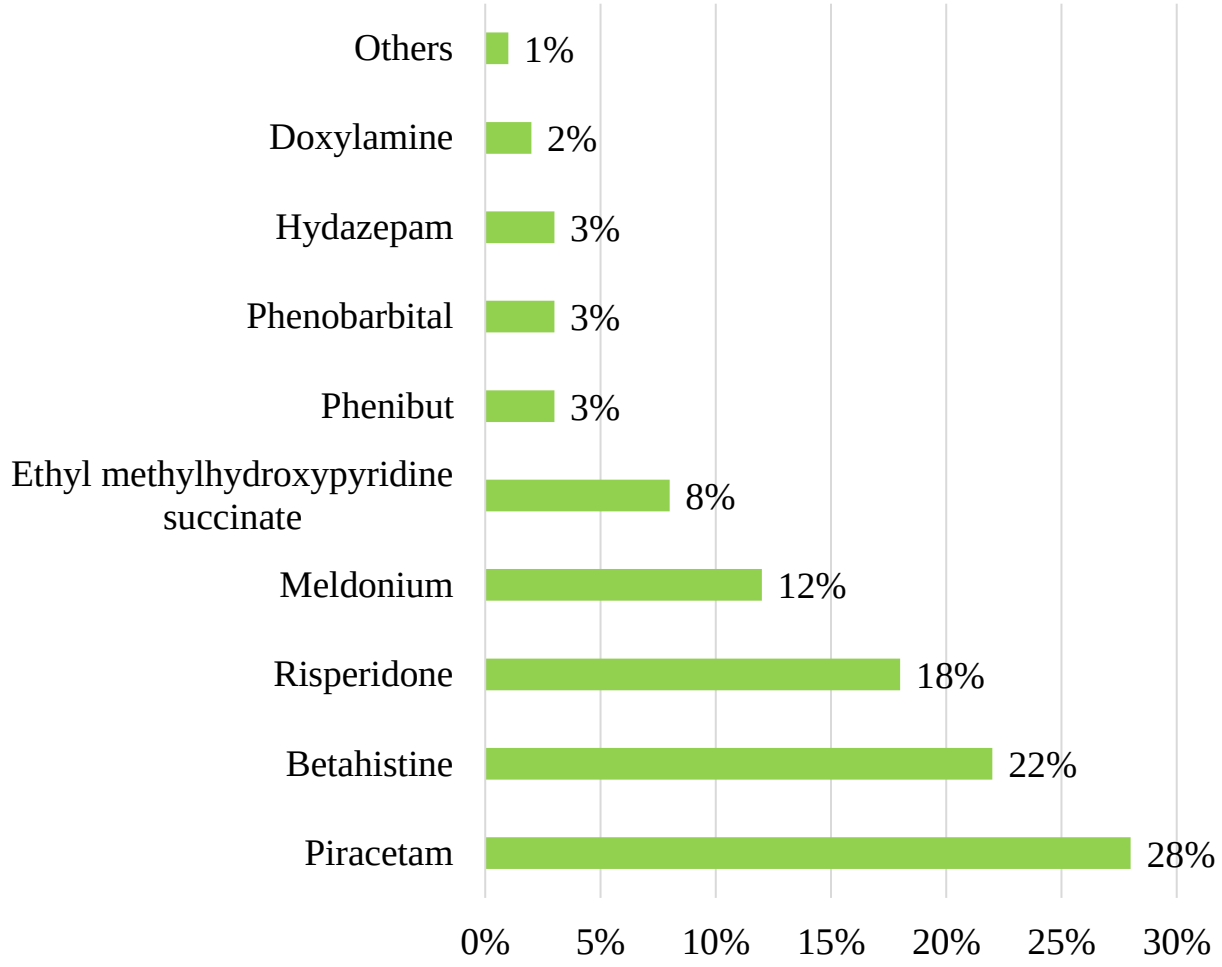

Fig. 3.13. Analysis of the main active substances in medicines that consumers use for the treatment of vegetative-vascular dystonia

Next, we analyzed the most common medicines for the treatment of vegetative-vascular dystonia (Fig. 3.14).

It was found that Corvaltab Extra tablets, 19% of consumers took Phenibut-Astrafarm pills of 250 mg – 16%, Gidazepam IC tablets 50 mg – 14%, Corvalol drops 50 ml – 10%, Corvaltab Extra tablets – 9%, Mildronat hard capsules 500 mg – 8%, Aminalon-KV capsules of 250 mg – 7%, Corvalol drops 25 ml – 6%, Gidazepam IC tablets 20 mg – 6%, Corvalol tablets N 10 – 5% (Fig. 3.14).

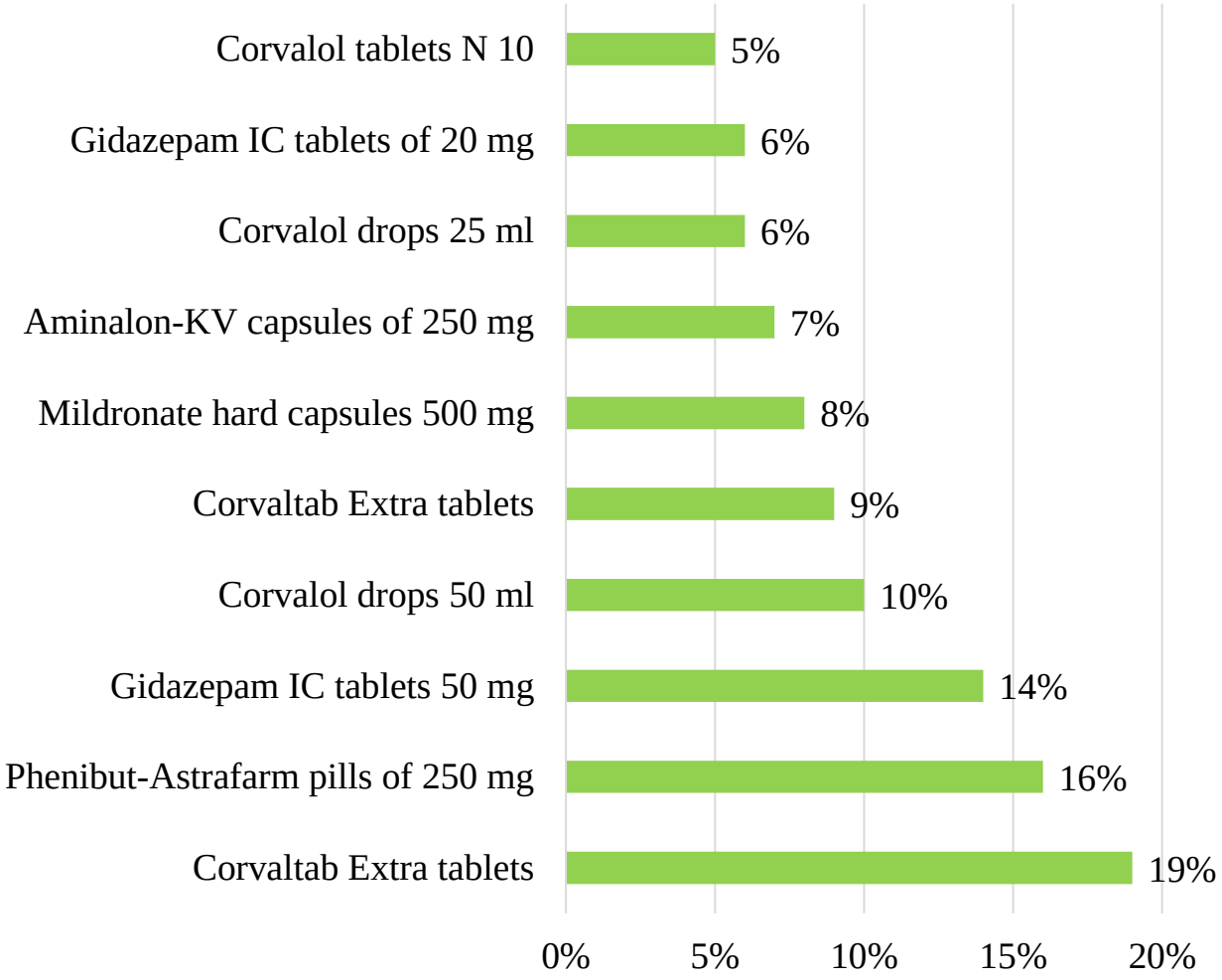

Fig. 3.14. Analysis the most common medicines for the treatment of vegetative-vascular dystonia

CONCLUSIONS TO PART 3

1. In the course of the marketing research, the structure of the assortment was determined, which is formed by 5 classification groups of medicines used for the treatment of SVD according to the ATC classification.

2. It was revealed that the leading position is occupied by group N "Medicines for the treatment of diseases of the nervous system" – 59%, the second position – group C "Medicines for the treatment of diseases of the cardiovascular system" – 19%, the third position – medicines of group A "Medicines affecting on the digestive tract and metabolism", which account for 7% of the total volume of the

assortment. Other drugs make up 15% of medicines used for the treatment of autonomic dysfunction syndrome.

3. As a result of a detailed intragroup analysis of group N – "Medicines for the treatment of diseases of the nervous system", it was established that it is formed by 6 subgroups of medicines. It was established that the leading position is occupied by group N06B "Psychostimulants and nootropics" – 64%. In second place is group N05C "Sedatives" – 15%. The third position is occupied by group N06A "Antidepressants" – 11%, others – 11% of medicines. It was found that 67% of medicines for the treatment of autonomic dysfunction syndrome are domestically produced, the remaining 33% are foreign medicines.

4. It was established that the market of drugs for the treatment of autonomic dysfunction syndrome is represented by medicines from 18 producing countries. It has been established that the leaders in the production of medicines used for autonomic dysfunction syndrome are: Ukraine – 61%, India – 13%, Germany – 4%. It was found that Slovenia holds a share of 3% of medicines for the treatment of autonomic dysfunction syndrome, Hungary – 2%, the Czech Republic – 1%, others – 9%.

5. It was revealed that the dominant part in the overall structure belongs to monocomponent medicines for the treatment of autonomic dysfunction syndrome, which is 98%, combined – 2%, respectively.

6. The analysis of the assortment by type of dosage form revealed that the share of solid forms for the treatment of autonomic dysfunction syndrome in the overall structure of the assortment is 85%, liquid forms – 14%, and soft forms – 1%.

7. It was found that the largest specific weight in the total nomenclature is occupied by solid dosage forms: tablets – 513 medicines (51%), coated tablets – 207 medicines (21%), film-coated tablets – 128 medicines (13%), specific weight other solid medicinal forms – 15% (172 medicines).

8. As a result of the analysis, an assortment macrocontour of the market of medicines used for the treatment of autonomic dysfunction syndrome was formed, which is mainly represented by medicines for the treatment of diseases of the

nervous system (59%), the leading place among which is occupied by psychostimulants and nootropics (64%). According to the production feature, medicines of domestic production prevail (67%). The range under study in 85% of cases is represented by solid dosage forms, mainly in the form of tablets (51%). The overall structure of the market is dominated by monopreparations (98%). The renewal of the range is 41.4%. In order to assess the consumer benefits of medicines used in the therapy of vegetative-vascular dystonia, marketing research was conducted on 50 consumers. It was found that 85% of women participated in the study and 15% of men. It was established that doctors most often prescribe imported medicines (73%) and only 27% – domestic medicines.

9. It was found that 37% of doctors prescribe brands to visitors; 23% – generic drugs and 40% – brand and generic medicines are prescribed with the same frequency. It was found that for 34% of consumers, the main thing when choosing a drug for the treatment of VD is the doctor's recommendation; for 25% – efficiency; for 22% of consumers – the price of medicine and for 12% – safety and for 7% – advertising in mass media.

10. The pharmaceutical forms of medicines for the treatment of VD, which were most often used by consumers, were analyzed. It was found that 72% of the respondents chose tablets, 14% – solution for injections, 5% – capsules, 4% – powder for preparation of solution for injections; 3% – oral solution, 2% – oral drops. Next, we analyzed the main active substances in the drugs that consumers use for the treatment of vegetative-vascular dystonia. It was found that piracetam is used by 28% of consumers, betahistine – 22%, risperidone – 18%, meldonium – 12%, ethyl methylhydroxypyridine succinate – 8%, phenibut – 3%, phenobarbital - 3%, hydazepam – 3%, doxylamine – 2%, others – 1%.

11. It was found that Corvaltab Extra tablets, 19% of consumers took Phenibut-Astrafarm pills of 250 mg – 16%, Gidazepam IC tablets 50 mg – 14%, Corvalol drops 50 ml – 10%, Corvaltab Extra tablets – 9%, Mildronat hard capsules 500 mg – 8%, Aminalon-KV capsules of 250 mg – 7%, Corvalol drops 25 ml – 6%, Gidazepam IC tablets 20 mg – 6%, Corvalol tablets N 10 – 5%.

GENERAL CONCLUSIONS

1. The maladaptation of people under stress conditions is characterized. A description of vegetative-vascular dystonia is given. Methods of treatment of vegetative-vascular dystonia have been studied.

2. In the course of the marketing research, the structure of the assortment was determined, which is formed by 5 classification groups of medicines used for the treatment of SVD according to the ATC classification.

3. It was revealed that the leading position is occupied by group N "Medicines for the treatment of diseases of the nervous system" – 59%, the second position – group C "Medicines for the treatment of diseases of the cardiovascular system" – 19%, the third position – medicines of group A "Medicines affecting on the digestive tract and metabolism", which account for 7% of the total volume of the assortment. Other drugs make up 15% of medicines used for the treatment of autonomic dysfunction syndrome.

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APPLICATIONS

Appendix A


IV Міжнародна науково-практична
інтернет-конференція
ПРОБЛЕМИ
ТА ДОСЯГНЕННЯ
СУЧАСНОЇ
БІОТЕХНОЛОГІЇ
22 березня 2024 р.
м. Харків, Україна

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ
КАФЕДРА БІОТЕХНОЛОГІЇ

MINISTRY OF HEALTH OF UKRAINE
NATIONAL UNIVERSITY OF PHARMACY
DEPARTMENT OF BIOTECHNOLOGY

ПРОБЛЕМИ ТА ДОСЯГНЕННЯ СУЧАСНОЇ БІОТЕХНОЛОГІЇ

PROBLEMS AND ACHIEVEMENTS OF MODERN BIOTECHNOLOGY

Матеріали
IV міжнародної науково-практичної
Інтернет-конференції

Materials
of the IV International Scientific and Practical
Internet Conference

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KHARKIV
2024

Molecular mechanisms of multiple effects of angiostatins in the injured cornea are required to be thoroughly studied for further translating these results in a clinical practice.

Analysis of the medication market for vascular dystonia

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Public health remains a critical issue regardless of social, economic, or political circumstances. Statistics show a low percentage, only 17%, of the population is truly healthy. The rest experience various chronic conditions or underlying abnormalities in their body's structure and function. Early intervention during crucial stages of disease development, along with proper rehabilitation after injuries, is essential. Autonomic dysfunction syndrome encompasses all forms of autonomic nervous system regulation problems. The high prevalence of autonomic dysfunction, ranging from 30% to 80% in the general population, underscores the ongoing importance of addressing this issue.

The purpose of the work is analysis of the medication market for vascular dystonia.

In order to assess the consumer benefits of drugs used in the therapy of vegetative-vascular dystonia, marketing research was conducted on 50 consumers. It was established that doctors most often prescribe imported drugs (73%) and only 27% – domestic drugs. It was found that 37% of doctors prescribe brands to visitors; 23% – generic drugs and 40% – brand and generic drugs are prescribed with the same frequency. It was found that for 34% of consumers, the main thing when choosing a drug for the treatment of SVD is the doctor's recommendation; for 25% – efficiency; for 22% of consumers – the price of medicine and for 12% – safety and for 7% – advertising in mass media. It was found the main active substances in the drugs that consumers use for the treatment of vegetative-vascular dystonia. It was revealed that

piracetam is used by 28% of consumers, betahistine – 22%, risperidone – 18%, meldonium – 12%, ethyl methylhydroxypyridine succinate – 8%, phenibut – 3%, phenobarbital – 3%, hydazepam – 3%, doxylamine – 2%, others – 1%.

Thus, we conducted analysis of the medication market for vascular dystonia.

Prospects for studying the toxicity of various chemicals in cell cultures

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Cell culture studies are increasingly used in scientific research, practical and regenerative medicine, and modern biotechnology.

Due to its advantages, such as the ability to determine the effect of a compound on a particular type of cell or tissue, as well as to neutralize the effects of the nervous, endocrine and immune systems, the cell culture method is in demand and relevant for studying the direct effect of exogenous (factors outside the body) agents, including cellular toxins and drugs, on certain groups of cells.

To study the effect of various substances on the body, cultures that differ in origin depending on the degree of tissue specialization (cell cultures obtained from adult animals or embryos), physiological state (normal or tumor tissues), and organotypic cultures (cultures that reproduce the complex cellular environment of the tissue from which they originate) can be used.

Studies on cell cultures of different origins, depending on the type of source tissue, such as cultures of fibroblasts, nerve cells, hepatocytes, kidney cells, splenocytes, and bone marrow cells, have their own characteristics.

Fibroblasts grow well in culture, and these cells are well isolated from mouse and rat embryos by enzymatic and explant methods. Fibroblast cell lines are among the most commonly used cultures for in vitro toxicity testing.

Thus, the use of a fibroblast cell line to study the effects on the animal body of certain chemicals, the use of which is known in therapeutic practice but requires

cont. app. A

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