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Research Article

# THE USE OF ANTIVIRAL X DRUGSIN MODERN PHARMACOTHERAPY

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## ABSTRACT

Literature analysis was carried out according to the classification of drugs (PM) with antiviral action. In the literature sources cited, the authors classify drugs according to their chemical structure and application. The article provides information on the study of the market of the Republic of Uzbekistan for 2019-2022. The analysis performed showed the prospects for the development, standardization and further introduction of antiviral drugs into medical practice. Along with synthetic drugs, preparations derived from plant materials are not inferior in relevance.

## KEYWORDS

Medicines, plant materials, antiviral drugs, mechanism of action, chemical structure.

## INTRODUCTION

Recently, there has been a wide interest in antiviral drugs. For the treatment and prevention of diseases caused by viruses, people buy more drugs. The effect obtained from the use of drugs in this category is

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expressed in ensuring the suppression of the pathogen, as well as stimulation of immunity. It should be noted that drugs in this category are not cheap and are used in the treatment of ARVI, influenza, viral hepatitis, HIV and herpetic infections.

For a clearer understanding, it was decided to conduct a brief classification and characteristics of the pharmacological action of antiviral drugs.

Antiviral drugs are classified by use (mechanism of action, clinical classification, by clinical and pharmacological feature and features of practical application) and by chemical structure, and also separate the class of drugs usedfor the treatment and prevention of influenza and ARVI.

Irus are the cause of a large number of diseases, including a number of diseases with extremely high lethality, as well as high epidemic potential (included in the WHO list of infectious diseases included in the list of events that can cause an emergency in the health system on an international scale", according to Annex No. 2 of the IHR-2005 [1]. All viral diseases that are life-threatening or may be accompanied by dangerous complications (for example, hepatitis B and C, herpetic encephalitis, diseases caused by cytomegalovirus in suppression of immunity in recipients during organ transplantation, HIV, Lassa fever) are classified as "requiring drug therapy"). In addition, specific therapy requires diseases that reduce the quality of life, in particular, causing significant cosmetic defects (for example, diseases caused by the human papillomavirus or herpes simplex).

**The purpose of** the study is to analyze antiviral drugs used in medical practice, according to the principle of action and use, as well as the chemical structure.

## METHODS

In the course of the study, information and analytical methods were used, literature data were studied, as well as the Register of Registered Drugs in the Republic of Uzbekistan.

## RESULTS AND DISCUSSION

Viral diseases are one of the big problems of medicine. According to the World Health Organization, about 2 million people die annually from influenza and acute respiratory diseases. About 90% of the adult population is infected with herpes simplex virus type 1, more than 70% with cytomegalovirus. More than 40 million people are infected with human immunodeficiency virus. Based on the foregoing, the creation of effective and safe antiviral drugs is relevant To develop drugs of this group, it is necessary to take into account the ways of transmission of viruses: airborne (respiratory viruses and viruses of natural and chickenpox, measles and mumps); food (enterocyrus, reoviruses, alpha viruses, adenoviruses, etc.); transmissible (with an insect bite, such as arboviruses and rhabdoviruses); through the skin (viruses of rabies, cowpox, papillomas); sexual (herpes viruses and papovaviruses); parenteral (hepatitis B) [2, 3, 4, 5]. In scientific articles, classifications of antiviral drugs are given.

Medicinal preparationare classified by mechanism of action [6], by chemical structure [7] and by medical use [8]

Most drugs with antiviral activity affect viral proteins that are important for viral replication, less often cellular proteins. Antiviral drugs can act at various stages of the life cycle of the virus, from the attachment of the virus and penetration into the cell, through the replication of viral DNA or RNA, up to the formation of new viral particles and their exit from the

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cell. Most antiviral drugs interfere with the functioning of viral enzymes or structural proteins. This is the basis of their more or less pronounced selectivity. Other substances bind to cellular proteins or glycoproteins, which are necessary for the replication of the virus inside the cell, or serve viruses as receptors. Antiviral drugs inhibit the reproduction of the virus and thereby allow the immune system to "cope" with a smaller number of cells infected with the virus. Some substances (for example, Imichimod) only increase the synthesis of cytokine proteins (interferon, etc.), so their mechanism of action is to enhance the body's own immune response. Unlike bactericidal antibiotics, antiviral chemicals do not directly destroy virus particles, having a viral effect.

The following stages of the life cycle of the virus are used as targets for selective antiviral therapy:

- Adsorption cell receptor virus
- Penetration of the virus into the cell
- "liberating" the viral genome
- Formation of viral proteins
- The process of formation of a virus molecule ("packaging")
- Exit of the virus from the cell

A prerequisite for effective antiviral therapy is knowledge of the pathogen. Unlike a number of antibacterial drugs, no antiviral agent has a wide spectrum of action, i.e., can not be used in various diseases. In cases where the exact causative agent cannot be determined (virological or clinical differentiation is not effective or is unreliable, for example, with life-threatening herpetic encephalitis), antiviral therapy is carried out, based on the assumption of a possible source of infection, "blindly", the virological diagnosis is then, if necessary, supplemented.

In addition, drugs with other mechanisms of action, including immunomodulators, pathogenetic and symptomatic agents, are used. Drugs of both synthetic and plant origin are used. Drugs are classified as follows: nucleoside analogues, drugs of non-nucleoside nature.

Currently, a number of herbal preparations that combine clinical efficacy with minimal severity of undesirable drug reactions are widely used for the treatment of herpetic infections [6]. **Hyporamine** is a dry extract based on a polyphenol complex, obtained from the leaves of buckthorn buckthorn, this drug directly blocks the synthesis of viral DNA (the main active ingredient is hydrolyzed tannins, at least 60% in terms of casuarynin) [7]. A similar mechanism of action has **panavir** – tuberous nightshade shoot extract containing hexose glycosides, additionally for this drug the general immunomodulatory effect is described [8, 9]. **Helepine**, an extract of Lespedenza bicolor, containing the sum of flavonoids, has a virucidal effect when applied topically [10]. **Alpizarin is** an extract of the Altai penny and yellowish penny, its active ingredient is the glycoside of the xanthonic nature mangiferin, which blocks the penetration of the virus into the cell [11]. For g**ossypol**, an extract of seeds and roots of the shaggy snapper, a combined mechanism of action is described: a direct inactivating effect on the virus due to interaction with envelope proteins of viral particles, as well as indirect immunomodulatory, due to the induction of interferons. The antiherpetic activity of **cuff extracts is described** [12]. Also known is the remedy **Aronim**, in the form of a liquid extract, which is used orally and contains in its composition extracts of the herb Echinacea purpurea and licorice roots, which in synergy increase immunity, show anti-inflammatory properties and activate the liver.

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**Tromantadine**, an antiviral agent for external use. Active against Herpes simplex viruses of the 1st and 2nd types, Herpes zoster. Inhibits the adsorption and penetration of viruses into the cell [13; 14].

**Vitagerpavak**, a vaccine containing specific inactivated antigens of herpes simplex viruses (HSV) I and II serotypes, obtained by reproduction in culture of transmissible cells Vero B. The therapeutic effect of the herpetic vaccine is associated with the activation of a specific reaction of antiviral immunity, increased activity of patients' lymphocytes, which persists for several months after the end of vaccination [15; 16, 17].

**Allokin-alpha**, an immunomodulating drug, is most similar in nature to α-interferon [18]. **Inosine pranobex**, a drug with a combined mechanism of action: the ability to suppress the synthesis of i-RNA viruses, as well as to activate the synthesis of cytokines and increase the phagocytic activity of macrophages (immunomodulatory effect) [19].

**Docosanol**, a polyatomic saturated alcohol, is found in the composition of policosanol. It is used in the cosmetic industry as a softener and emulsifier. Antiviral properties are described for the compound, the mechanism of action is currently not well understood [20]. **Hepon** is a synthetic immunomodulator of a peptide nature. The drug induces alpha-, beta- and gamma-interferons, activates neutrophilic granulocytes, attracts monocytes (macrophages) to the zone of inflammation, enhances the synthesis of antibodies, thereby significantly increasing the ability of the immune system to resist infections, including viral etiology. An effective monotherapy with hepone against diseases of a herpetic nature is described.

Based on the foregoing, marketing research wasconducted on the pharmaceutical market of the Republic of Uzbekistan of antiviral drugs. For this, the State Register of Medicines from 2019 to 2022 was used.

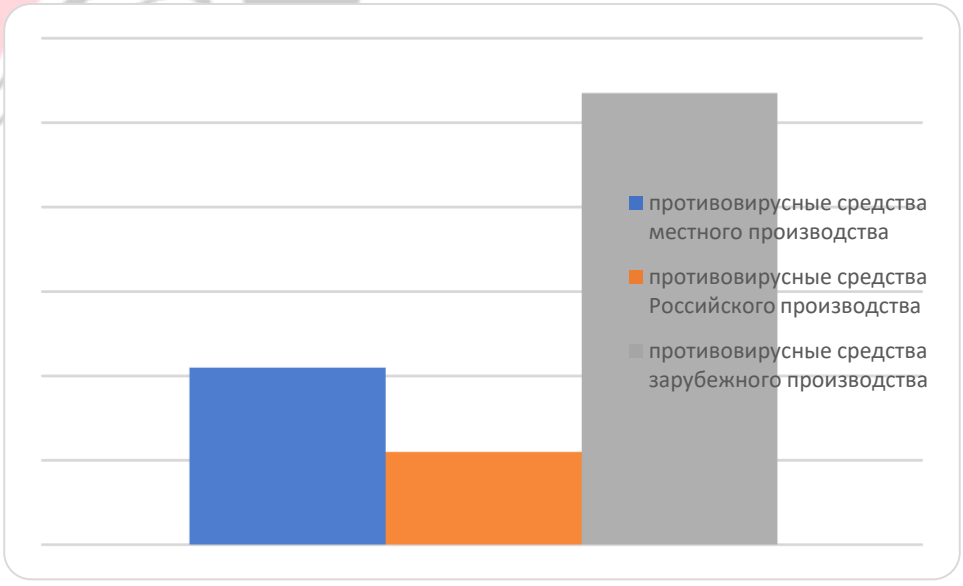


**Fig.1. Antiviral drugs registered in the period 2019-2022 in the Republic of Uzbekistan**

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As can be seen from the diagram, more than 30 names of medicines were registered by local manufacturers, 9 of which is "Acyclovir" in the form of tablets and ointments. Drugs of Russian manufacturers are registered about 20 names, prevail the drugs used in the treatment of HIV infections, as well as drugs used in the treatment of simple flu.

In view of the large number of imported drugs from foreign countries (more than 100 items), it was decided to study them according to the classification of use in medical practice. So, the study of drugs registered in the RUz of foreign production, make up drugs used in the treatment of HIV-, AIDS, HPV, as well as hepatitis B and C, cytomegaloviruses, to a lesser extent the drugs are used in the treatment of herpesviruses.

## CONCLUSION

Currently, the development of new effective and safe drugs with antiviral activity is relevant. A number of studies are being conducted in the preparation and standardization of drugs in this category. At the same time, along with the synthesis of drugs, increasing preference is given to the search and production of drugs from plant raw materials.

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