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RESEARCH ARTICLE

The Study of volume and structure of sales of Pharmaceutical assortment of Antihypertensive drugs to 2019

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ABSTRACT:

A study of the range of antihypertensive drugs on the pharmaceutical market of Ukraine. The ratio of domestic and foreign drugs within each pharmacotherapeutic group of drugs is determined. The positions of Ukraine and foreign suppliers regarding the volume of antihypertensive drugs represented on the Ukrainian pharmaceutical market have been established. The final part of the pharmacoepidemiological study was to study the volume and structure of sales of antihypertensive drugs according to the largest regional wholesale distributors in 2019, and also determined the average retail price of antihypertensive drugs in the pharmacy network.

KEYWORDS: pharmaceutical market, antihypertensive drugs.

INTRODUCTION:

In recent years, Ukraine has developed an unfavorable demographic situation, namely a steady decline in population, a significant increase in morbidity and mortality, a reduction in life expectancy[14,22]. Negative trends in the deteriorating health of the population of Ukraine are mainly due to cardiovascular diseases, which by 61,2 % determine the overall mortality rate[11,15,18].

Among the pathologies of the cardiovascular system, the most common is hypertension, which occurs in 15-20 % of the adult population of industrialized countries and is recognized as a chronic non-communicable disease[7,16]. In addition, a significant proportion of patients with high blood pressure remain undetected, as evidenced by numerous epidemiological studies[11,19].

Today, 90 % of all forms of hypertension are primary (essential) hypertension is a disease characterized by elevated blood pressure and not associated with any independent damage to organs and systems[9,17].

Hypertension is often referred to as a «silent killer» because it is often asymptomatic but plays an important role in the development of various diseases[6,22]. High blood pressure is the main cause of cardiac, cerebral and vascular complications, such as coronary heart disease, chronic heart failure, cerebrovascular disorders[13,20].

The most effective way of secondary prevention of cardiovascular complications and reduction of mortality is antihypertensive treatment[4]. Numerous studies[10] have shown that with regular antihypertensive therapy it is possible to reduce mortality from stroke by 40-45 % and myocardial infarction by 15-20 %[23,24].

Currently, 10 classes of antihypertensive drugs are recommended for the treatment of essential hypertension[5,12], which, in turn, can be divided into drugs of the first and second series.

The aim of this work was to study the range of antihypertensive drugs used to treat essential hypertension, represented in the pharmaceutical market of Ukraine[21].

MATERIALS AND METHODS OF RESEARCH:

The study of the range of drugs was conducted in accordance with the State Register of Drugs and the

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classification of the ATS system. The objects of the study were antihypertensive drugs (diuretics, β-blockers, calcium antagonists, ACE inhibitors, angiotensin II receptor blockers, peripheral vasodilators, rauwolfia alkaloids). The method of analysis of secondary marketing information was used. As information sources used information retrieval system «Drugs» of «Morion». Statistical, logical and graphical methods were used during the work.

RESEARCH RESULTS AND THEIR DISCUSSION:

First of all, we studied the range of antihypertensive drugs available on the domestic pharmaceutical market. It is established that as of December of 31, 2019, 1581 antihypertensive drugs were registered in Ukraine under 73 international names. Among them, first-line antihypertensive drugs are most widely represented on the domestic pharmaceutical market, namely ACE inhibitors (29,6%), β-blockers (20,5%) and calcium antagonists (17,1%). Drugs of the group of agonists of central alpha-adrenoreceptors are the least represented, which make up only 0,1% of the total range of antihypertensive drugs presented on the pharmaceutical market of Ukraine (Fig. 1).

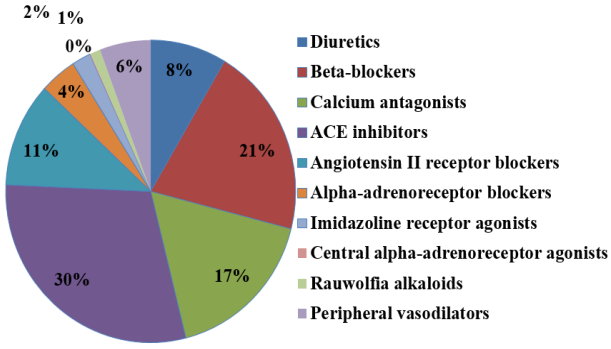

Fig. 1. Number of registered drugs presented on the pharmaceutical market of Ukraine

The next stage of the study concerned suppliers of pharmaceuticals with antihypertensive action on the domestic pharmaceutical market. Of the total number of registered drugs, 395 assortment items are represented by Ukrainian manufacturers, which is 25% of the total number of drugs in the study group. The main number of domestic drugs with antihypertensive action are drugs from the group of ACE inhibitors (22,0%), calcium antagonists (32,0%) and beta-blockers (28%), which are first-line drugs in the treatment of essential hypertension. In general, out of 10 pharmacotherapeutic groups of antihypertensive drugs used to treat essential hypertension, the largest share of domestically produced drugs is in the group of peripheral vasodilators (52,0%) (Fig. 2).

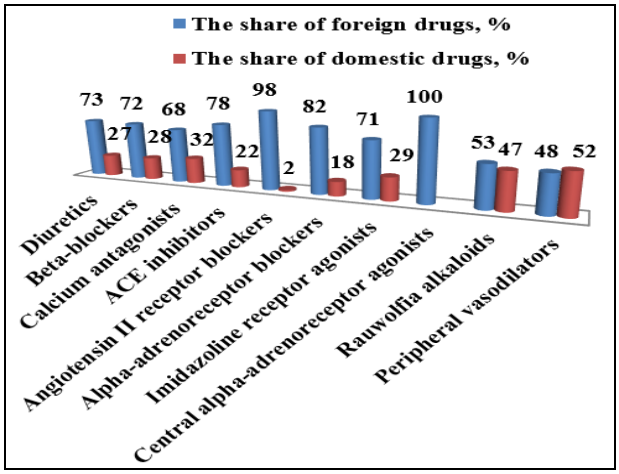

Fig. 2. The ratio of the nomenclature of drugs of domestic and foreign production within each pharmacotherapeutic group of antihypertensive drugs

Among the suppliers of antihypertensive drugs, the leading position in terms of supply is occupied by the Pharmaceutical Company «Darnytsia», whose drugs account for 12,8% of the total range of drugs of domestic production (42 items). In addition, a significant amount of products for the domestic pharmaceutical market comes from the Pharmaceutical Company «Health» (11,0% - 36 items), «Astrapharm» (9,5% - 31 items), «Borshchagivskiy Chemical-Pharmaceutical Plant» (8,6 % - 28 items) and «Farmak» (8,6% - 28 items). Collectively, these manufacturers supply the domestic pharmaceutical market with 50,5% of the total range of antihypertensive drugs of domestic production.

Among foreign suppliers, the first place is occupied by Germany (21% of the range of antihypertensive drugs of foreign production; 16 suppliers), the second - India (19 % of the range, 20 suppliers), the third - Slovenia (10% of the range, 2 companies).

Analysis of dosage forms of antihypertensive drugs presented on the pharmaceutical market of Ukraine showed that the main share of them is presented in the form of tablets - 93%; 3% of drugs with antihypertensive action enter the domestic market in the form of capsules; 3,5% in the form of funds for parenteral use. Drops for oral use, pills and gel were also registered, which together make up 0,5% of all dosage forms of antihypertensive drugs represented on the pharmaceutical market of Ukraine.

Analysis of sales revealed that the number of units sold (i.e. packaging) the first position is occupied by combined drugs (35%); of these, 51% were accounted for by adelphan-ezidrex, 45% by andipal, 1,5% by enap-H and trirezid and 1% by enap-HL. Other drugs (i.e. noliprel) accounted for less than 1%.

In terms of the number of sold units of antihypertensive drugs, ACE inhibitors were in second place (28%). Among them, enalapril accounted for 78%, captopril - 12 %, lisinopril - 8%. The share of other drugs accounted for 0,1 to 2%. Enalapril drugs were presented in 28% enap, in 27% - enam, in 22% - enalapril, 11% - ednit. The share of the original drug renitek had a little more than 1% (1,06 %).

Of the total number of antihypertensive drugs sold, diuretics accounted for 11%. In their structure, indapamide drugs occupied 46%. They were represented in 47% by a drug with the commercial name indapamide, in 41% by indap. The share of arifon was 4%, and its retard form - 5%. Other brands of indapamide accounted for 3%. In the structure of diuretic drugs, hydrochlorthiazide drugs accounted for 27%, furosemide - 14%. Other diuretics were present in 13%.

Calcium antagonists ranked third in terms of sales (16 %). Of these, 63% were nifedipine, 34% - verapamil. Amlodipine was 2,0%. Diltiazem and lacidipine together accounted for less than 1%. The most common in the structure of nifedipine drugs were phenigidine (30%), cordafen (12%), cordaflex-retard (12%) and corinfar (10 %). Prolonged forms accounted for 23% of nifedipines and 16% of all calcium antagonists. The group of drugs verapamil, mainly, was represented by the same brand (89%), and isoptin-SR accounted for 2,0%. Other brands of verapamil were represented in 9%.

The share of beta-blockers among the total number of sold antihypertensive drugs was 8%. 46% of them consisted of drugs atenolol, which, in turn, 62% were represented by the same brand name, 37% - atenololacry and 1% - atenololver. 29% of the beta-blockers sold were propranolol, 88% were anaprilin and 12% were obzidan. Bisoprolol under the concor brand accounted for 4% of all beta-blockers. Metoprolol accounted for 16 %, it was represented in 71% by egiloc, in 25% by metoprolol, in 3% by a drug with the same trade name, and by 1% by other drugs. In the general structure of beta-blockers 5% in total were drugs betaxolol (lokren), carvedilol (dilatrend), nebivolol (nebilet).

In the overall structure of the implemented antihypertensive drugs, the share of drugs of central action accounted for 2,0% (alpha-blockers, AT II receptor antagonists and drugs from other pharmacological groups).

Analysis of sales, expressed in monetary terms, revealed the leadership of ACE inhibitors (48%), followed by calcium antagonists (16%) and diuretics (14%). As already mentioned, the share of combined drugs accounted for 10%. They were slightly inferior to beta-blockers (9%). In the structure of total sales of antihypertensive drugs, the share of drugs of central action was 3,0%.

In the same part of the pharmacoepidemiological study was carried out the collection and analysis of information on retail prices of drugs in the pharmacy network.

Summarizing the results obtained in this part of the pharmacoepidemiological study, it should be noted that along with a significant volume of sales of ACE inhibitors, even greater sales accounted for combined drugs. Significant demand for such drugs is probably due to their low cost. In almost all groups, generics were definitely in the lead in terms of sales. Thus, among enalapril drugs, a significant share fell on one of its cheapest generic analogues - enam.

CONCLUSIONS:

Thus, the analysis of the cost and volume of sales of antihypertensive drugs allowed to identify one of the main components of direct medical costs, presented in the form of drug costs, confirm the results of the study of drug use structure and real patient preferences, and supplement the data needed to select specific drugs further clinical study, which was performed at the next stage of work.

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