

Study Of The Assortment Of Antioxidant And Hemostatic Medicines Registered In The Republic Of Uzbekistan

D.M.Sarvarova, N.A. Madatova, N.A.Yunuskhodzhaeva, I.M.Iminova.

Tashkent Pharmaceutical Institute

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Abstract

An analysis of the range of antioxidant and hemostatic preparations registered in the Republic of Uzbekistan was carried out on the basis of information from the State Registers of Medicines, Medical Devices and Medical Equipment: 2019 No. 23, 2020 No. 24, 2021 No. 25. The sales volume of hemostatic drugs in the Uzbek market in 2019-2021 was studied based on DRUG AUDIT data.

Introduction: the ability of blood to clot is an important defense mechanism against death by blood loss. Surgery, traumatology, natural disaster medicine and the treatment of hemophilia are inconceivable without hemostatic preparations.[1].

According to statistics, bleeding due to trauma is one of the leading causes of death for people aged 1 to 34 worldwide. 30% of deaths are associated with severe blood loss. Medicinal herbs with a hemostatic effect have been known for centuries. But it is practically impossible to solve the problem with medicinal plants; lethal outcomes from blood loss are still observed [2].

The development and implementation of hemostatic injectables instead of foreign drugs is an actual issue today.

Currently, cerebrovascular pathology ranks second among the main causes of death, yielding in this indicator only to heart disease and already outstripping mortality from tumors of all localizations. The leading role among these diseases is occupied by strokes, affecting from 5.6 to 6.6 million people annually and claiming 4.6 million lives. According to the World Health Organization, the incidence of stroke ranges from 1.5 to 7.4 per 1,000 people. In the US, a cerebral stroke occurs every 53 seconds.

One of the most effective methods of treating chronic forms of cerebrovascular accidents is currently the use of antioxidants and non-specific therapy for cerebral stroke, which are specific correctors of the energy metabolism of the brain, acting precisely under conditions of ischemia and hypoxia.

Currently, synthetic drugs for the treatment and prevention of cerebrovascular accidents are widely used in medicine.

The preparation Ceraxidol (Ethylmethylhydroxypyridine succinate) is widely used as an active drug. The main purpose of ceraxidol is related to heteroaromatic antioxidant analogues of compounds of the vitamin B group (6). It has a wide range of pharmacological activity, in particular, it is an inhibitor of free radical processes, which has antihypoxic, nootropic, anxiolytic and anticonvulsant effects. The drug increases the body's resistance to the effects of various damaging factors, to pathological conditions (shock, cerebrovascular accident, hypoxia and ischemia, intoxication with alcohol and antipsychotics (neuroleptics)) [8]. The drug improves cerebral blood supply and brain metabolism, improves microcirculation and reduces platelet aggregation, blood rheology. Stabilizes membrane structures of blood cells during hemolysis. It has a hypolipidemic effect, reduces the content of total cholesterol and low density lipoproteins. Reduces enzymatic endogenous intoxication and toxemia in acute pancreatitis [7].

Methods: to study the content analysis of the assortment analysis of preparations with a antioxidant and hemostatic effect for the period 2019-2021. To study the position of antioxidant and hemostatic preparations on the market in these years based on DRUG AUDIT data.[3].

One of the marketing indicators that determine the potential of the pharmaceutical market is the analysis of the range of medicines.[3].

As an object in the analysis process were taken issues 23 of 2019, 24 of 2020 and 25 of 2021 from the State Register of Medicines, Medical Products and Medical Equipment registered in the Republic of Uzbekistan and the order of the Ministry of Health of the Republic of Uzbekistan dated 23.03.2021 No. 3289 "On approval of the list of essential medicines".

The analysis began with a study of the range of registered antioxidant drugs in the Republic of Uzbekistan.

Results: according to the State Register of medicines, medical devices and medical equipment permitted in the medical practice of the Republic of Uzbekistan No. 26 dated November 10, 22, a total of 33 types of antioxidant drugs were registered on the territory of Uzbekistan, and in 2021 they amounted to 25 items. In the range of these drugs, 5 (15.1%) were foreign manufacturers, 19 (57.6%) - manufacturers from the CIS and 9 (27.3%) - domestic manufacturers.

In 2021, in the range of these drugs, 4 (16%) were foreign manufacturers, 16 (64%) - manufacturers from the CIS and 5 (20%) - domestic manufacturers. Based on these indicators, compared with 2021, in 2022 the number of registered antioxidant drugs increased. A significant increase in indicators was observed among domestic and CIS manufacturers.

At the next stage of our analysis, a 5-year analysis of the State Register of medicines, medical devices and medical equipment permitted in the medical practice of the Republic of Uzbekistan was carried out. Accordingly, Table 1 presents the results of the analysis of antioxidant drugs registered by the Republic of Uzbekistan in 11 years in 2017, 14 in 2018, 12 in 2019, 24 in 2020, and 25 in 2021. Comparison results are shown in Table 1.

Year	Uzbekistan		CIS		Abroad		General amount
	amount	%	amount	%	amount	%	
2018	0	0	13	92,8	1	7,2	14
2019	0	0	10	83,4	2	16,6	12
2020	5	20,8	16	66,7	3	12,5	24
2021	5	20	16	64	4	16	25
2022	9	15,1	19	57,6	9	27,3	33

According to the State Register No.25 of "Drugs, medical products and medical equipment registered in the Republic of Uzbekistan" adopted in 2021, a total of 94 names of drugs with hemostatic properties are used in the territory of Uzbekistan. 22 of these drugs (23.4%) are produced by local manufacturers, 55 of them (58.5%) are foreign manufacturers and 17 (18.1%) are from CIS countries.[4].

The results of the comparison of the obtained results with the indicators of 2019 and 2020 are presented in Table 1. The table shows that in 2019-2021, the number of hemostatic drugs imported from abroad and registered by local manufacturers increased.

In the following part of our analysis, we compared these obtained results with the data of the State Register of Medicines, medical supplies and medical equipment registered in the Republic of Uzbekistan No. 23 of 2019. According to the data of 2019, medicines with hemostatic properties were registered in total 49 names on the territory of Uzbekistan. 12 of these drugs (24.5%) were produced by local manufacturers, 27 (55.1%) by foreign and 10 (20.4%) by CIS countries manufacturers. [6]

Table 2 Analysis of registration of drugs with hemostatic effect in the section of producing countries.

Manufacturers	2019 year		2020 year		2021 year	
	amount	%	amount	%	amount	%
Total amount	49	100	79	100	94	100
CIS manufacturers	10	20.4	16	20.2	17	18.1

Foreign manufacturers	27	55.1	39	49.4	55	58.5
Local manufacturers	12	24.5	24	30.4	22	23.4

According to the order of the Ministry of Health of the Republic of Uzbekistan No. 3289 dated March 23, 2021 “On approval of the list of essential medicines”, hemostatic preparations included in this list contain of aminocaproic acid, menadione, include etamsylate, tranexamic acid, protamine sulfate and other preparations containing the main active ingredient.

Table 3 Hemostatic drugs in the list of main medicines

Number	International non-proprietary name	Forms of drugs
1	Aminocaproic acid	solution for infusion 5%
		powder
2	Menadione	solution for injection
		tablets
3	Etamylat	tablets
		solution for injection
4	Tranexamic acid	tablets
		solution for injection
5	Protamine sulfate	solution for injection
6	Blood coagulation factor 8	powder solvent for preparation of injection solution
7	Blood coagulation factor 9	powder solvent for preparation of injection solution

As can be seen from the results, year by year the number of hemostatic preparations passed the general register has increased, and the share of hemostatic preparations brought from the CIS and abroad has also increased. The number of hemostatic drugs produced by domestic pharmaceutical enterprises has been increasing year by year. Most of the registered hemostatic drugs are made by foreign manufacturers.

Table 4 Assortment analysis of drugs with hemostatic effect by dosage forms

Drug form	2019		2020		2021	
	amount	%	amount	%	amount	%
Total	49	100	79	100	94	100
Injection solution	31	63.3	58	73.4	72	76.6
Tablet	6	12.2	10	12.6	14	14.9
Capsule	2	4.0	2	2.6	2	2.2
Drops	1	2.0	-	-	-	-

Collection of plants	9	18.5	8	10.2	5	5.3
Liquid extract			1	1.2	1	1

Table 4 shows the results of the analysis of hemostatic drugs by dosage form.

According to the data, the majority of hemostatic drugs are drugs that are released in the form of injectable drugs. According to the data of the 2021 Register, it was found that 44 names of hemostatic drugs produced and registered by foreign manufacturers are in the form of injectable drugs, and 11 names are in the form of tablets and capsules. It was considered that 15 of the drugs produced and registered by local manufacturers are in the form of injection, 1 is a liquid extract, 1 is a tablet, and 5 are medicinal plants.

In 2019, most of the forms of hemostatic drugs produced by local manufacturers were composed of medicinal plants, and by 2021, synthetic drugs began to take over. This indicator mainly indicates the increased demand for hemostatic drugs of this synthetic type and in the form of injectable drugs.

The next stage of the registration analysis is devoted to the dosage form and the main active ingredient of antioxidant drugs, the results of which are presented in Table 5. Dosage forms of antioxidant preparations registered for 2018-2022

Table 5

Dosage form	Main active ingredient: Ethylmethylhydroxypyridine succinate				
	2018y	2019y	2020y	2021y	2022 y
Solution for injection	10	9	19	21	28
Tablets	3	2	4	4	4
Capsules	1	1	1	1	1

As can be seen from the above data, a significant proportion of antioxidant drugs is the number of drugs that are produced in the form of injectables.

Basically, injectable antioxidant drugs are produced by local manufacturers. Taking this into account, it is important to provide the population with drugs in the form of various dosage forms of antioxidant preparations.

In the next part of our analysis, we studied the volume of sales of hemostatic drugs in the market of the Republic of Uzbekistan in 2019-2021 based on DRUG AUDIT data.

Table 6 Analysis of the study of the volume of sales of drugs with a hemostatic effect.

Sales volume in years	Amount (thousand packs)	Total amount (billion soums)
2019	392	12.5
2020	411	41.8
2021	781	83.3

According to the results of the analysis, in 2019-2021, the sales of hemostatic preparations in the market increased both in terms of quantity and amount.

The results show that the share of registered imported antioxidant drugs in the pharmaceutical market is growing relative to the share of domestic manufacturers. Therefore, the interest of local producers in demand is growing today. At the next stage of the study, we analyzed countries that produce antioxidant drugs. The results of the analysis showed that antioxidant drugs are produced by pharmaceutical companies and firms from different countries [4,5,6].

The results of the analysis are presented in table 7.

Table 7. Analysis of the registration of antioxidant drugs by producing countries.

Manufacturer country name	Number of registered preparations							
	amount	%	amount	%	amount	%	amount	%
	2018 y.		2019 y.		2020y.		2021 y.	
Turkey	1	7,14	2	16,7	2	8,4	2	8,0
Russia	9	11,1	9	75,0	7	29,8	7	28,0
Georgia	2	14,3	1	8,3	4	16,6	3	12,0
Ukraine	2	14,3			3	12,5	3	12,0
Romania					1	4,2	1	4,0
Belarus					1	4,2	1	4,0
Armenia					1	4,2	2	8,0
Uzbekistan					5	20,1	5	20,0
India					-		1	4,0
Kazakhstan								

In the next part, we analyzed the data on how much and how many million soums the pharmaceutical enterprises of Uzbekistan produced hemostatic drugs in 2019-2021.

Table 8 The amount of hemostatic drugs produced by pharmaceutical enterprises of Uzbekistan in 2019-2021.

Manufacturing company	Amount (per package)			Total amount (million)		
	2019	2020	2021	2019	2020	2021
MERRYMED FARM	-	30100	102770	-	361	1.233
Uzbek chemical Pharm	40600	-	-	142		
UZGERMED PHARM	-	-	4504	-	-	36

The results of the analysis show that "MERRYMED FARM" among the pharmaceutical manufacturers of Uzbekistan produced the most hemostatic drugs in 2020-2021.

This indicates that the need for this group of drugs is growing.

Discussion: as can be seen from the results of the analysis, both in terms of the variety of species and the number of dosage forms, the prevalence of local antioxidant drugs in the CIS countries. Currently, most of the antioxidant drugs registered in Uzbekistan are also drugs produced in the CIS countries.

Conclusion: in conclusion, based on the above data, we can conclude that since 2017, along with an increase in the number and types of drugs with antioxidant properties produced by domestic manufacturers, the share of drugs registered both from far abroad countries and from the CIS countries has also increased significantly. Currently, 80% of drugs with antioxidant properties registered in Uzbekistan are registered from the CIS countries and from other foreign countries. Thus, an analysis of the registration of antioxidant drugs in the pharmaceutical market of the Republic of Uzbekistan shows that at present, the creation and introduction into production of domestic highly effective antioxidant drugs is very relevant and promising.

As it can be seen from the results, hemostatic drugs produced by foreign manufacturers are leading both in terms of the type and number of dosage forms. Hemostatic drugs produced and registered by foreign manufacturers make up a large part of the drugs available on the market now.

Based on these data, we can conclude that: since 2019, the number and form of hemostatic drugs produced by local manufacturers has increased, and therefore the share of drugs imported from abroad and from the CIS countries has almost doubled. Currently, 78% of hemostatic drugs available on the market are imported from abroad and CIS countries. Thus, it is very urgent to introduce a new pharmacological group of hemostatic drugs and new drug forms by local manufacturing enterprises.

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