

# MARKETING RESEARCHES OF MARKET ON MEDICATIONS FOR NEUROPROTECTIVE ACTION IN UKRAINE

Original research article

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## Abstract

The assortment of neuroprotective medications, presented in the pharmaceutical market of Ukraine, has been investigated in this article. Correlation of medications of home and foreign manufacture within the limits of each pharmacotherapeutic group of medications was determined.

The analysis of the assortment of neuroprotective medications has also been conducted regarding dosage forms.

During the research of assortment of neuroprotective action medications, present in the market of Ukraine, we used data of the State Register of Medicinal Remedies of the Ministry of Health of Ukraine. While conducting marketing analysis of the market of medications, we adhered to the ATC classification system.

It was determined that home manufacturers supply the internal pharmaceutical market with 38.8% of preparations of the investigated group. Herewith, leading positions in terms of supply volume belong to ZAT (Close Joint-Stock Company), pharmaceutical firm "Darnytsia" and JSC "Galychpharm". Preparations of each of the above-mentioned firms make 10.7% of the general assortment of home-produced medications.

The rating of 25 foreign countries – suppliers of medications for neuroprotective action to the pharmaceutical market of Ukraine – showed that the leader in terms of volume of the presented medications is Russia, whose medications make 16.4% of the assortment of neuroprotective medications of foreign manufacture. The second place belongs to Germany (15%), and India (11.6%) takes the third place.

There was disclosed expediency of expansion of home-produced preparations nomenclature and their dosage forms for ischaemic stroke treatment.

**Keywords** marketing research – neuroprotective medications – pharmaceutical market of Ukraine – assortment – ischaemic stroke

## 1. Introduction

Currently, cerebral strokes are one of the principal reasons of death rate and disability in the world [Lopez et al., 2006, Marunich et al., 2011]. Annually about 16 million people fall ill with cerebral stroke, and about 7 million die as a result of it. In Ukraine, about 110,000 cerebral strokes are being registered a year and about 40,000 end up being fatal.

The problem of stroke is acute not only for Ukraine but also for many European countries. Substantial differences in prevalence, morbidity and death rate from a stroke are marked among the countries of Eastern and Western Europe. As a rule, it is stipulated by the differences of risk factors, in particular by the level of arterial hypertension, and also other risk factors which result in the greater amount of heavy strokes in Eastern Europe [Anishchenko et al., 2011, Brainin et al., 2000].

Strokes are the main reason of incapacitation, second reason by value of dementia and third by value of death after heart diseases and malignant tumours. It is stated that a stroke causes the death of about 30% of patients in the first month after the disease's nascence, repeated strokes arise with a

frequency of 4–14% a year. In general, death rate during the first year reaches 30–40%. More than in 50% of disease cases, evident residual physical disability of patients with functional disorder is specified.

Treatment of stroke, long-term disability and invalidisation result in considerable economic charges. In the conditions of hard deficit of money, which we observe in the Ukrainian system of health protection, the question of effective, economic and rational stroke treatment acquires an important social significance. Therefore, search of treatment methods allowing to decrease medical and social burden of ischaemic stroke is one of high priority directions of modern medicine and pharmacy. Restorative therapy gains an important value for functional recovery of brain dysfunction after one has suffered a stroke. Restorative therapy is aimed at flexibility increase of unaffected brain tissue and activation of polysynaptic interneuronic connections [Mureshanu, 2007]. Medicated neuroprotection is aimed to protect neurons at a focal ischaemia, prevent neuronal "death" at the cellular and molecular levels, correct the

consequences of vascular disease, have the possibility of the maximum early use, reduce sharp strokes severity, reduce the volume of brain infarction, increase therapeutic window for implementation of thrombolysis and protect brain from secondary reperfusion injury [Alonso de Lecinana et al., 2005]. As mentioned above, the aim of our research is the analysis of the presented assortment of medications of neuroprotective action in the pharmaceutical market of Ukraine, which are used for ischaemic stroke treatment.

## 2. Material and methodology

We conducted the research of the medications assortment according to the data of the State Register of Medicinal Remedies of the Ministry of Health of Ukraine and ATC classification system. Preparations of neuroprotective action became the objective of our research (Fig. 1).

Herewith, the method of secondary marketing information analysis was used. Compendium of 2009 was used as the informative sources [Information retrieval system "State Register of drugs of Ukraine", Kovalenko and Viktorova, 2009]. During the research, we used statistical, logical and graphical methods.

## 3. Results

### Nomenclature of neuroprotective medications

The study of nomenclature of the neuroprotective medications presented in home pharmaceutical market became the first stage of the research. It is determined that as of January 2013, the assortment of the medications registered in Ukraine was presented by 338 preparations of neuroprotective action (211 trade names aside from producer). Among them, the most part of medications in the home pharmaceutical market was presented by preparations of group N06B X – other psychostimulants and nootropics (32%), N07C A – anti-vertigo preparations (12.1%), C01E B – other cardiac preparations (9.2%) and A16A X – various alimentary tract and metabolism products (7.7%). In a lesser degree, there are represented medications of group C05C X – other capillary stabilising agents and A11A B – multivitamins, other combinations, which comprise only 0.3% from the general assortment of neuroprotective medications introduced in the pharmaceutical market of Ukraine (Table 1) [Information retrieval system "State Register of drugs of Ukraine", Kovalenko and Viktorova, 2009].

We also investigated the correlation of nomenclature of medications of home and foreign production within the limits of each pharmacotherapeutic group of neuroprotective medications (Fig. 2).

### Manufacturing firms of neuroprotective medications

The next stage of the analysis we carried out was the research on suppliers of the neuroprotective action medications in the home pharmaceutical market. It should be noted that currently, basic assortment of the medications in the pharmaceutical market in Ukraine is being formed by means of

preparations of foreign manufacture. A part of registered neuroprotective medications of Ukrainian manufacture in relation to imported medications presents 38.8% (which makes 131 stock keeping unit) against 61.2%.

In the next stage of our research, we performed an analysis of assortment of neuroprotective action medications of foreign pharmaceutical manufacturers (Fig. 3).

### Assortment of dosage forms

In the next stage of our research, we analysed the assortment of medications according to dosage forms. It was established that the investigated preparations are considerably varied by dosage forms. Therefore, in the home pharmaceutical market medications are presented in 11 dosage forms, most of which make up tablets – 51.7%, solutions for injections make up 26.6% of nomenclatures and capsules – 11.2%. There are also registered solutions for oral use, suspensions for oral use, concentrates for infusions, lyophilisates for injections, nasal drops, powders for oral solutions, solutions for infusions and dragee, which together make up 10.5% of all dosage forms of neuroprotective medications that are present in the pharmaceutical market in Ukraine (Fig. 4).

## 3. Discussion

The investigation conducted showed that from 25 pharmacotherapeutic groups of medications used for ischaemic stroke treatment, home-manufactured medications make the most part in the group of bioflavonoids (80%), and in the groups of nicotinic acid and derivatives, xanthine derivatives and vitamin B1 plain, the full assortment of medications is provided (100%). Among the nomenclature of remedies that are used for dementia, home producers in the Ukrainian pharmaceutical market provide only 7% of the general assortment of this group. Analysis of the assortment of anti-cholinesterases, other parasympathomimetics, fatty acid derivatives, vitamin B-complex plain, other cardiac combination products, multivitamins, other combinations, other capillary stabilising agents showed that in the nomenclature of the above-mentioned pharmacotherapeutic groups, the medications of home manufacture are not presented in the pharmaceutical market of Ukraine.

According to the amount of the preparations presented in the market, Ukraine is in first place among all supplying countries of neuroprotective medications to the home pharmaceutical market. It is determined that the nomenclature of home-manufactured neuroprotective medications is provided by 31 producing firms, among which the leading position by the volume of supply belongs to the pharmaceutical firm "Darnyt-sia" and JSC "Galychpharm", preparations of each of these firms make 10.7% of the general assortment of home-produced neuroprotective medications (14 items by each firm). In addition, the considerable volume of products to the internal pharmaceutical market comes from the pharmaceutical company "Zdorovie" Ltd – 10% (13 items), "Farmak" JSC – 9.2% (12 items),

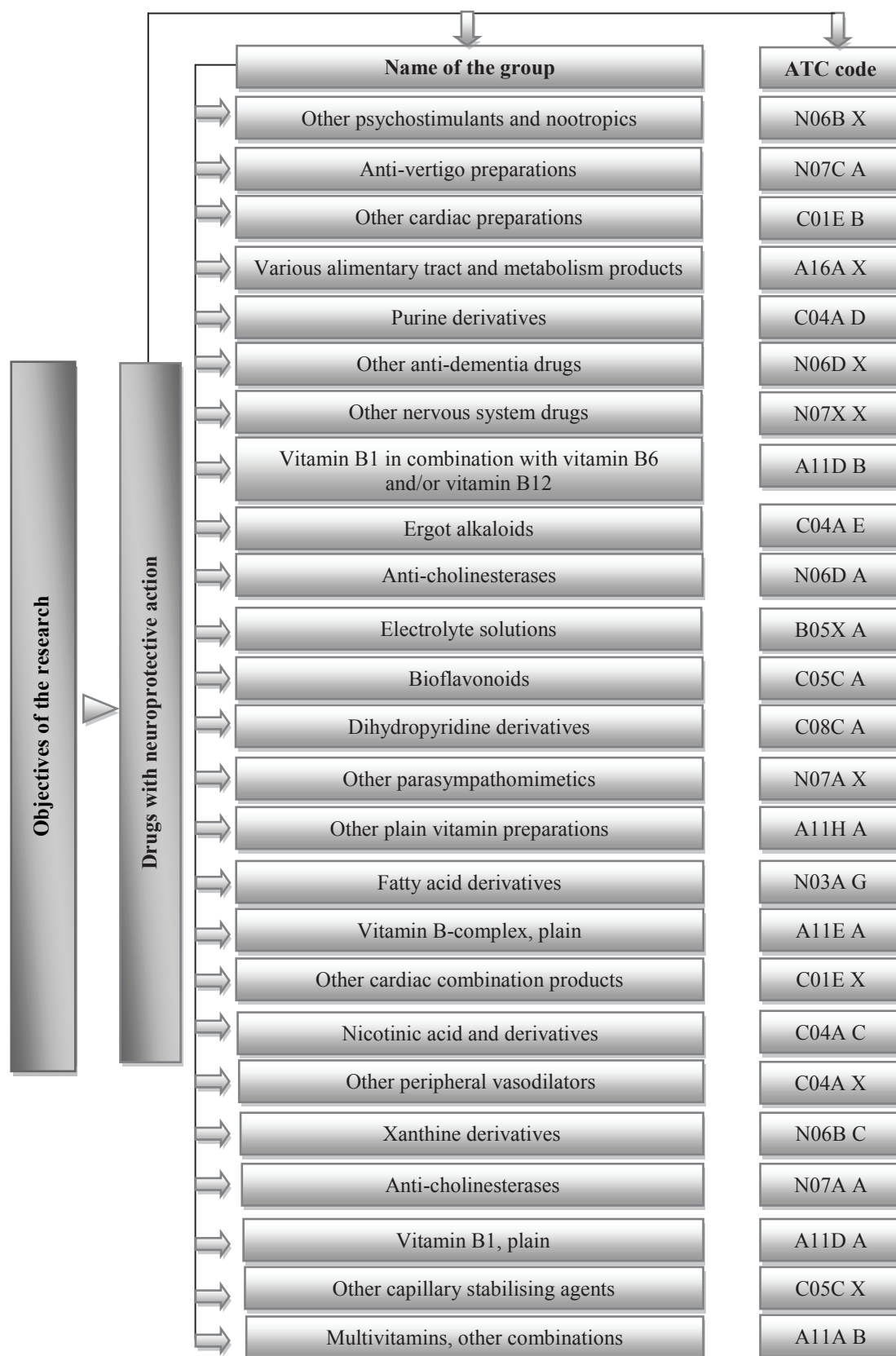


Figure 1. The objectives of the research.

Table 1. Structure of neuroprotective medications assortment according to ATC classification

ATC code	Name of the group	Trade names	
		Absolute number	Share in total, %
N06B X	Other psychostimulants and nootropics	108	32
N07C A	Anti-vertigo preparations	41	12.1
C01E B	Other cardiac preparations	31	9.2
A16A X	Various alimentary tract and metabolism products	26	7.7
C04A D	Purine derivatives	22	6.5
N06D X	Other anti-dementia drugs	15	4.4
N07X X	Other nervous system drugs	15	4.4
A11D B	Vitamin B1 in combination with vitamin B6 and/or vitamin B12	14	4.1
C04A E	Ergot alkaloids	10	3
N06D A	Anti-cholinesterases	6	1.8
B05X A	Electrolyte solutions	5	1.5
C05C A	Bioflavonoids	5	1.5
C08C A	Dihydropyridine derivatives	5	1.5
N07A X	Other parasymphomimetics	5	1.5
A11H A	Other plain vitamin preparations	4	1.2
N03A G	Fatty acid derivatives	4	1.2
A11E A	Vitamin B-complex, plain	3	0.9
C01E X	Other cardiac combination products	3	0.9
C04A C	Nicotinic acid and derivatives	3	0.9
C04A X	Other peripheral vasodilators	3	0.9
N06B C	Xanthine derivatives	3	0.9
N07A A	Anti-cholinesterases	3	0.9
A11D A	Vitamin B1, plain	2	0.6
A11A B	Multivitamins, other combinations	1	0.3
C05C X	Other capillary stabilising agents	1	0.3

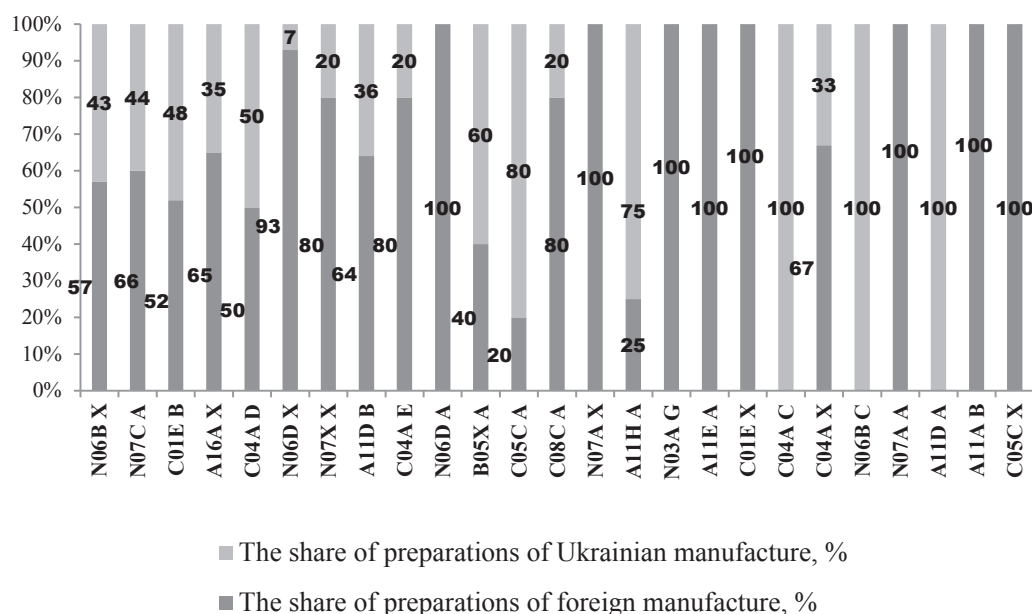


Figure 2. Nomenclature of medications of home and foreign manufacture within the limits of pharmacotherapeutic groups of neuroprotective medications.

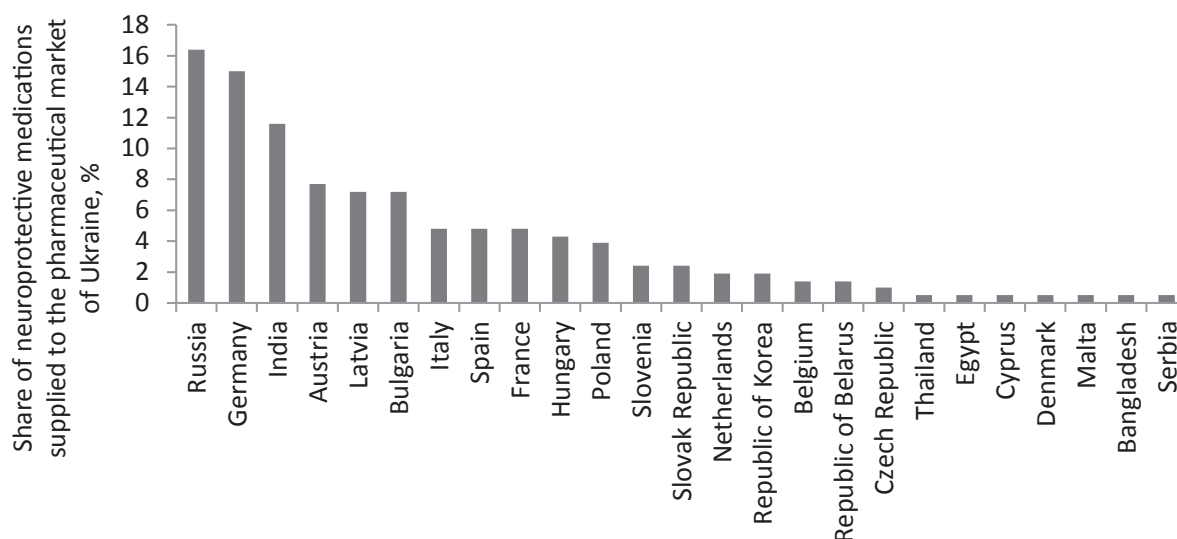


Figure 3. Rating of foreign countries-suppliers of neuroprotective medications in the Ukrainian pharmaceutical market.

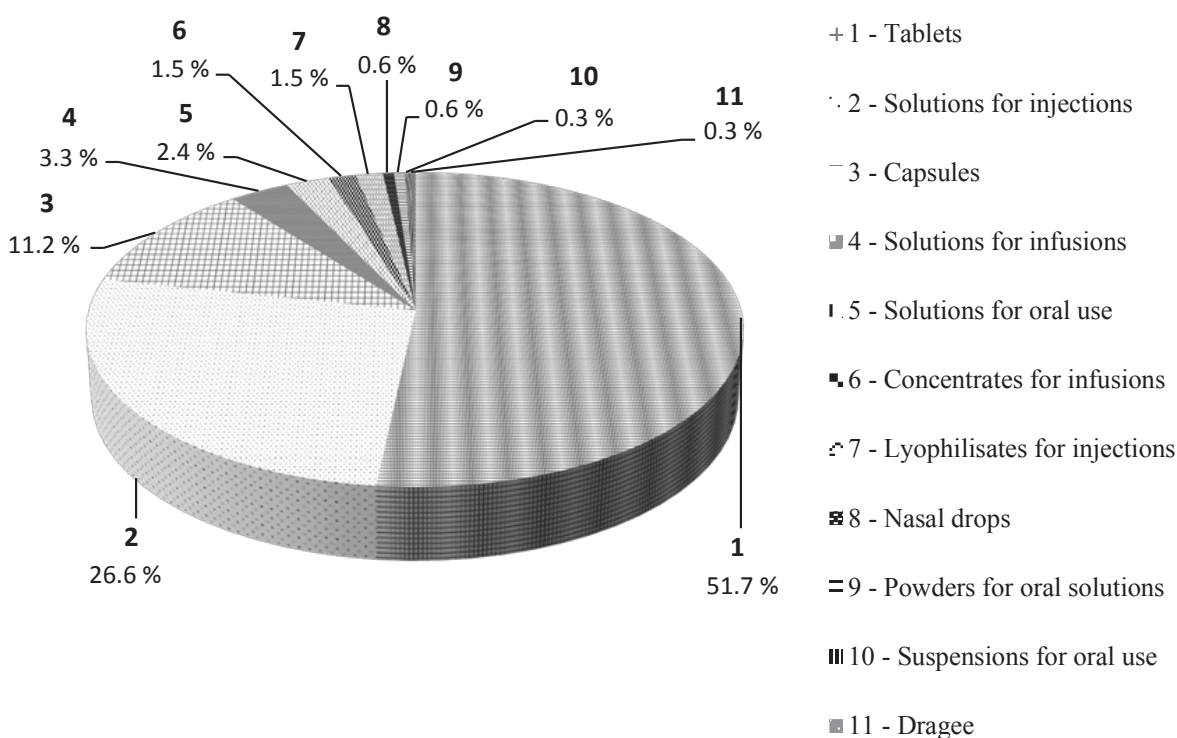


Figure 4. Structure of neuroprotective medications market depending on dosage forms.

PJSC SIC "Borshchahivskiy CPP" – 5.3% (7 items) and "Pharmex Group" LLC – 5.3% (7 items). Thus, the given manufacturing firms supply to the internal pharmaceutical market 51.2% of the general assortment of neuroprotective medications of home manufacture.

The assortment of medications for ischaemic stroke treatment of foreign manufacture is provided by 84 firms-manufacturers from 25 countries of the world, among which the first place belongs to Russia (16.4% of the assortment of medications

of neuroprotective action of foreign manufacture), Germany is the second (15%) and India is the third (11.6%). The least amount of stock-keeping units in the pharmaceutical market of Ukraine is presented by Thailand, Egypt, Cyprus, Denmark, Malta, Bangladesh and Serbia, each of which supply 0.5% of medications of neuroprotective action of foreign manufacture presented in the Ukrainian pharmaceutical market. According to the results of the research, it was determined that the assortment of foreign neuroprotective medications dif-

fers in the greater variety of dosage forms in comparison with home medications. Thus, neuroprotective medications of the Ukrainian manufacture are not presented in the pharmaceutical market in the form of suspensions for oral use, nasal drops, powders for oral solution and dragee. This fact points out the perspective and urgent necessity of home manufacturers reorientation on production of medications similar to the imported drugs with high efficiency and ease of application.

#### 4. Conclusions

There was an investigation conducted on the assortment of medications for neuroprotective action presented in the pharmaceutical market of Ukraine. According to the data received, it was determined that the home pharmaceutical market mostly presented medications of the groups of other psychostimulants and nootropics, anti-vertigo preparations, other cardiac preparations and various alimentary tract and metabolism products that all together make 61% of medications for neuroprotective action.

Herewith leading positions in terms of volume supplied belongs to ZAT (Close Joint-Stock Company), the pharmaceutical

firms "Darnytsia" and JSC "Galychpharm" and preparations of each of the firms make 10.7% of general assortment of home-produced medications.

The rating of 25 foreign countries-suppliers of medications for neuroprotective action to the pharmaceutical market of Ukraine showed that Russia leads first in terms of volume of the presented medications, preparations of which form 16.4% of the assortment of neuroprotective drugs of foreign production, the second place by the volume of supply belongs to Germany (15%) and third is India (11.6%).

The investigation that was conducted allows to specify the basic directions of perfection of the assortment of medications for neuroprotective action for home manufacturing firms. In particular the expansion of the nomenclature of medications, which belong to the following pharmacotherapeutic groups: other anti-dementia drugs, anti-cholinesterases, other parasympathomimetics, fatty acid derivatives, vitamin B complex, plain, other cardiac combination products, multivitamins, other combinations and other capillary stabilising agents.

With regard to dosage forms, it is essential to increase the nomenclature of neuroprotective drugs in the form of suspensions for oral use, nasal drops and powders for oral solution.

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