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THE ANALYSIS OF CONSUMPTION MARKERS OF PARKINSON'S DISEASE TREATMENT MEDICINES IN UKRAINE

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INFORMATION

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antiparkinsonian medicines;
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pharmaceutical market.

ABSTRACT

The aim of the work. The purpose of the study was to determine the features and trends of medicines consumption among the population of Ukraine for the treatment of Parkinson's disease in natural and monetary terms for year 2014–2018.
Materials and Methods. The following methods were used during the study: logical, system analysis, comparative analysis and generalization of information.
Results and Discussion. According to the results of a retrospective analysis of the consumption of medicines for 2014–2018, it was found that the volume of retail sales of medicines had a growing trend. The analysis of the growth rates of retail sales in terms of domestic and foreign pharmaceutical production showed negative changes in the dynamics of domestic sales of natural products in physical terms. It is proved that the number of sold packages of medicines included in the National list of essential medicines in 2018 increased by 76.86 % compared to 2014. At the same time, the number of sold packages of medicines that are not listed in the National list of essential medicines decreased in 2018 by 8.12 %.
Conclusions. The results of the analysis of indicators of sales of medicines for treatment of Parkinson's disease indicate the prevalence of foreign products over domestic in cash and natural terms. As well main problems and prospects for the development of this segment of domestic market were identified.

Introduction. In the current situation of global demographic aging, the priority for each country is to preserve and promote well-being of the elderly by providing qualitative and affordable medical and pharmaceutical help to improve social protection of the citizens. However, an important part of the implementation of national health policy is the state support for patients with serious illnesses, where Parkinson's disease (PD) holds a special place and it's the second most prevalent neurodegenerative disease among the elderly. According to statistics from the Ministry of Health of Ukraine to date, 61,4 people with Parkinson's disease per 100,000 population are registered in Ukraine [1]. The experience of socially oriented health systems shows that timely differentiated individualized treatment of PD with modern medicines leads to a significant reduction in the frequency of complications, prevents disability, improves the quality of life of the patients and promotes their active longevity.

At the same time, according to part 10 of Article No. 10 of the Law of Ukraine "About State Financial Guarantees of Public Health Services" [2], medicines that are included in the National List of Essential Medicines (NLEM) and medical guarantee programs are payed from the State Budget of Ukraine. It should be noted that the NLEM [3] used for the treatment of PD

includes such international non-proprietary named (INN) medicines, such as biperidene derivatives and levodopa in combination with carbidopa. Considering the growing quantity of epidemiological factors of PD and the multiplicity of medical and pharmaceutical care, studies that provide an opportunity to evaluate the costs of pharmacotherapy and the rational use of a medicines in the treatment of this disease are of particular relevance.

Materials and Methods. The purpose of the study was to determine the features and trends of medicines consumption among the population of Ukraine for the treatment of PD in natural and monetary terms for year 2014–2018. To achieve this goal, the following tasks were developed:

• calculate the retail sales of medicines in monetary terms for 2015–2018 at comparative prices up to the base year 2014;

• to calculate and analyze the dynamics of changes in the rate of growth of medicines for the treatment of Parkinson's disease in physical and monetary terms for 2014–2018;

• to analyze the dynamics of changes in the rate of growth of retail sales of medicines in the context of domestic and foreign production;

• to conduct an analysis of the dynamics of retail sales of medicines for treatment of PD, which are included in the NLEM in natural and monetary terms.

• to systematize the data obtained to identify the main trends in the development of the specified segment of the domestic pharmaceutical market and to outline directions for prospective research in the future.

For the analysis of the retail sales of medicines for the treatment of Parkinson's disease, we used the data of analytical company “Pharmstandart” of the company “Morion” [5]. In order to convert retail sales in cash in comparative prices to the base year 2014, we used retail price indices, which were calculated and analyzed in a previous study [6]. To calculate the rate of increase we used the formula:

$$GR = \frac{(S_n - S_{n-1}) * 100\%}{S_{n-1}};$$

where,

GR – growth rate (%);

S_n – an indicator of retail sales of medicines for the treatment of PD in natural and monetary terms per year.

Structural analysis of the pharmaceutical market segment was performed according to the V levels of ATC-classification, which is recommended by WHO for the analysis of the consumption of medicines, in particular, and in marketing research in total [7]. All statistical data were processed using the Microsoft Excel 365. The following methods were used during the study: logical, system analysis, comparative analysis and generalization of information.

Results and Discussion. In the first stage of the study, we calculated and analyzed the growth rates of retail sales of antiparkinsonian medicines in both natural terms and cash. According to the results of a retrospective analysis of the consumption of medicines for 2014–2018, it was found that the volume of retail sales of medicines had a growing trend. Thus, in 2016 this figure exceeded by 120 million UAH for 584 thousand packs with a growth rate of 53.25 % in cash and 32.88 % in natural terms compared to 2015.

It is established that in 2018 the growth rates in cash increased by 29.56 %, and in natural terms – by 98.2 % compared to 2014. The results of the analysis of consumption of medicines for 2014–2018 in monetary and natural terms are shown in Table 1 and Table 2.

The analysis of the consumption of medicines in natural indicators shows that in 2015 there was a gradual decrease in sales of antiparkinsonian medicines. Thus, the number of packages of medicines sold significantly decreased in 2015 compared to 2014, such as: rotigotine (GR_{2015} = -88.30), ropinirole (GR_{2015} = -86.97), levodopa, decarboxylase inhibitor and COMT inhibitor (GR_{2015} = -25.24). It should be noted that during 2016–2018 rotigotine was absent in retail pharmaceutical market of Ukraine, and in our opinion that caused its possible decrease in growth rates.

During 2016–2017, there is a general trend of growth of retail sales of antiparkinsonian medicines in natural ($R_{inc2016}$ = 32.88 %; $R_{inc2016}$ = 35.56 %). The highest values of the rate of increase were observed among such medicines in INN as: rasagiline (GR_{2016} = 460.23 %; GR_{2017} = 124.94 %), rivastigmine (GR_{2016} = 43.92 %; GR_{2017} = 126.66 %), levodopa, decarboxylase inhibitor and COMT inhibitor (GR_{2016} = 36.23 %; GR_{2017} = 20.42 %).

According to the results of the study, it was found that in 2018, there is a negative trend towards a decrease in the retail sales of antiparkinsonian medicines in natural terms (GR = -7.10 %). This fact is of concern and needs further study as the value of the population incidence rate for PD increases and the number of medicine packs sold decreases. It is noteworthy that biperiden was first submitted on the retail pharmaceutical market in the 2017, which adversely affected the average growth rate in 2018.

According to the results of the analysis of retail sales of medicines in cash (Table 2), it is proved that during 2014–2017 a a positive upward trend in the value of the growth rate index (GR_{2015} = 14.71 %; GR_{2016} = 53.25 %; GR_{2017} = 29,30 %).

Rivastigmine (GR_{2015} = 158.84 %) in 2016, and 2017 – rasagiline (GR_{2016} = 462.88 %, GR_{2017} = 120.35) were leaders in the growth rate of sales among antiparkinsonian medicines in cash. In 2018, the highest positive growth rate is demonstrated by levodopa, decarboxylase inhibitors and COMT inhibitor. Thus, the volume of sales in the cash of this group of medicines increased significantly in 2018 compared to the previous periods – from 6.12 % in 2015 to 31.95 % in 2018 (by 25.83 %).

Table 1
Dynamics of growth rates (GR) of retail sales of medicines for treatment of Parkinson's disease in natural terms

ATC index, INN	2014/2015	2015/2016	2016/2017	2017/2018
	GR , %	GR , %	GR, %	GR, %
N04AA01 Trihexyphenidyl	-13,91	-13,22	-10,60	-7,79
N04AA02 Biperiden	-	-	-	-100,00
N04BA02 Levodopa and decarboxylase inhibitor	8,09	19,45	20,42	13,75
N04BA03 Levodopa, decarboxylase inhibitor and COMT inhibitor	-25,24	36,23	53,84	65,59
N04BB01 Amantadine	-4,64	9,57	16,52	4,98
N04BC04 Ropinirole	-86,97	-86,25	75,30	-77,64
N04BC05 Pramipexole	14,05	34,58	28,55	23,62
N04BC08 Piribedil	-19,45	-1,37	1,01	-15,04
N04BC09 Rotigotine	-88,30	-100,00	-	-
N04BD01 Selegiline	-17,77	-8,62	-9,87	-20,97
N04BD02 Rasagiline	-	460,23	124,94	17,24
N06DA03 Rivastigmine	118,61	43,92	126,66	11,03
Average	-9,63	32,88	35,56	-7,10

Table 2
Dynamics of growth rates (GR) of retail sales of medicines for treatment of Parkinson's disease in cash

ATC index, INN	2014/2015	2015/2016	2016/2017	2017/2018
	GR	GR	GR	GR
N04AA01 Trihexyphenidyl	14,54	-3,26	-5,19	-2,10
N04AA02 Biperiden	-	-	-	-
N04BA02 Levodopa and decarboxylase inhibitor	22,18	28,97	15,63	9,92
N04BA03 Levodopa, decarboxylase inhibitor and COMT inhibitor	6,12	29,74	29,34	31,95
N04BB01 Amantadine	28,16	12,30	14,99	9,30
N04BC04 Ropinirole	-37,11	-41,92	32,61	-49,44
N04BC05 Pramipexole	13,25	15,21	19,25	16,30
N04BC08 Piribedil	-3,19	1,41	8,30	-3,47
N04BC09 Rotigotine	-69,99	-	-	-
N04BD01 Selegiline	14,27	-0,65	-4,56	-4,29
N04BD02 Rasagiline	-	462,68	120,35	-5,47
N06DA03 Rivastigmine	158,84	28,04	62,30	-20,26
Average	14,71	53,25	29,30	-1,76

Particular attention should be paid to the data obtained for 2018, which show that there is a tendency of growth rate decrease(GR_{2018} = -1.76 %). Thus, it can be argued that the negative processes observed in the financial market of Ukraine led to an increase of the prices of medicines and had a direct impact on the sales of medicines for the treatment of PD.

It was found that in 2018, only 4 medicine INN had a positive trend of increasing sales in monetary terms, namely: levodopa, decarboxylase inhibitors and COMT

inhibitor (GR = 31.95 %), pramipexole (GR = 16.30 %) , levodopa with decarboxylase inhibitors (Tpr 2018 = 9.92 %), amantadine (GR = 9.30 %). This fact indicates the priority of choosing pharmacotherapeutic groups of medicines for treatment regimens of patients with PD.

The next stage of our research was the analysis of the growth rates of retail sales in terms of domestic and foreign pharmaceutical production. Unfortunately, negative changes in the dynamics of sales of domestic medicines in natural terms are observed (Fig. 1). Thus, the number of packs of domestic medicines sold in 2018 decreased by 29.48 % compared to 2014. It should be noted that in the period of 2014–2018, the largest sales of medicines of domestic production (90–95 % of the total number of packages sold medicine) is accounted for trihexyphenidyl. At the same time, during 2016–2018, the foreign production medicine showed a positive trend of retail sales growth (GR_{2016} = 16.36 %; GR_{2017} = 19.53 %; GR_{2018} = 9.82 %). The aforementioned fact indicates a decrease in the demand of domestic medicines relative to foreign production.

Indicators of retail sales of medicines, both domestic and foreign, in cash, during 2015–2018 shows a positive upward trend (Fig. 2). It is established that in this segment the largest volume of sales in cash is provided by foreign production medicines – 92.4 % of the total sales in 2014–2018. In particular, the implementation of the state program of replacement of imported medicines will provide an opportunity to provide the population of Ukraine with effective, high quality and affordable antiparkinsonian medicines of domestic production. Also, these mechanisms will save budget funds as a result of reducing the cost of purchasing imported medicines and free up foreign currency funds. The further creation of favorable conditions for the development of the pharmaceutical industry of Ukraine according to the innovation-investment model the increase of the revenue part of the state budget due to the increase in the volume of production of medicines by domestic enterprises.

It should also be noted that there is a tendency for an increase in the growth rate of domestic medicines in cash relative to a decrease in the growth rates of these medicines in natural units, which indicates an increase in retail prices for these medicines. Unfortunately, this situation testifies the lack of effectiveness among the current methods of state regulation of pricing for pharmaceutical products, in particular, to fulfill the tasks of eliminating the negative consequences of market processes in the industry.

In accordance with the provisions of the CMU Resolution No. 333 of 25.03.2009 “Some Issues of State Regulation of the Prices of Medicines and Medical Devices” procurement of medical establishments by health institutions and institutions financed wholly or in part from the state and local budgets according to the NLEM. However, only if the full extent of the need for medicines from the National

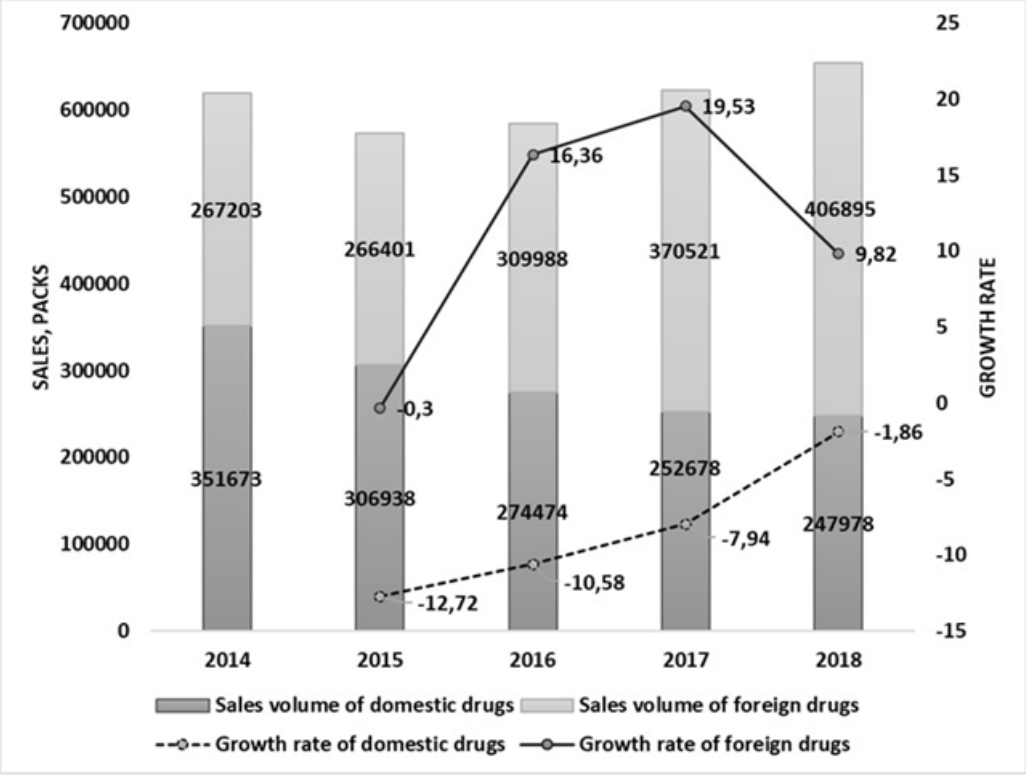

Fig. 1. Dynamics of indicators of retail sales of medicines for the treatment of Parkinson's disease in physical terms.

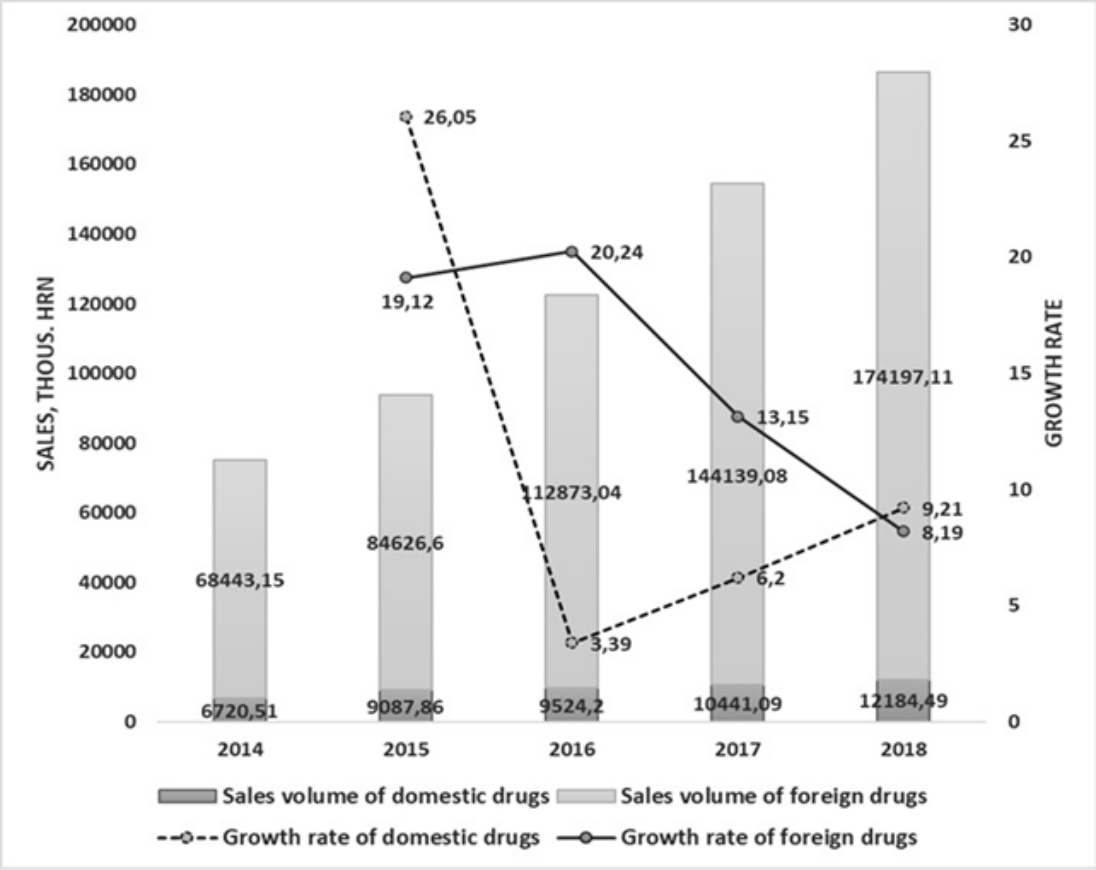

Fig. 2. Dynamics of indicators of retail sales of medicines for the treatment of Parkinson's disease in cash.

List is fulfilled, healthcare institutions can purchase medicines registered in Ukraine and not included in the National List. Thus, it is the NLEM that is primarily aimed at the implementation of programs of state guarantees for providing the population with free pharmaceutical and medical care in hospitals and outpatient setting.

Therefore, the next stage of our study was the analysis of retail sales of medicine for the treatment of PD in the natural indicators, which are included in the NLEM and medicine not listed in it (Fig. 3).

According to the results of the analysis it is established that during 2014–2018 there is a gradual increase in the volume of retail sales of pharmaceutical products. Thus, the number of sold packs of medicines that are included in the NLEM in 2018 increased by 76.86 % compared to 2014. It should be noted that positive growth rates of consumption of medicines that are not included in the National List were observed only in 2017, 2018, versus 2016, 2017, respectively.

The results of the analysis of retail sales of medicines in cash show that the growth rates for 2014–2018 medicines, which are included in the NLEM and medicines, which are not specified in it, increased by 79.4 % and by 45.3 % in accordance. For medicines, which are on the NLEM, sales in monetary terms increased from 30455 UAH in 2014 to 91621 UAH in 2018 (26.90 %). It is established that the largest volume of sales in monetary units is provided by pharmaceuticals not included in the NLEM – 53.2 % of the total sales of antiparkinsonian medicines.

The results of the analysis of indicators of sales of medicines for treatment of PD indicate the prevalence of foreign products over domestic in cash and natural terms. According to the results of the study, it can be argued about necessity for import substitution of antiparkinsonian medicine groups, which, in our opinion, will provide an opportunity to increase the overall availability of medicines of these groups for the population and will increase the overall quality of life of patients with PD in Ukraine.

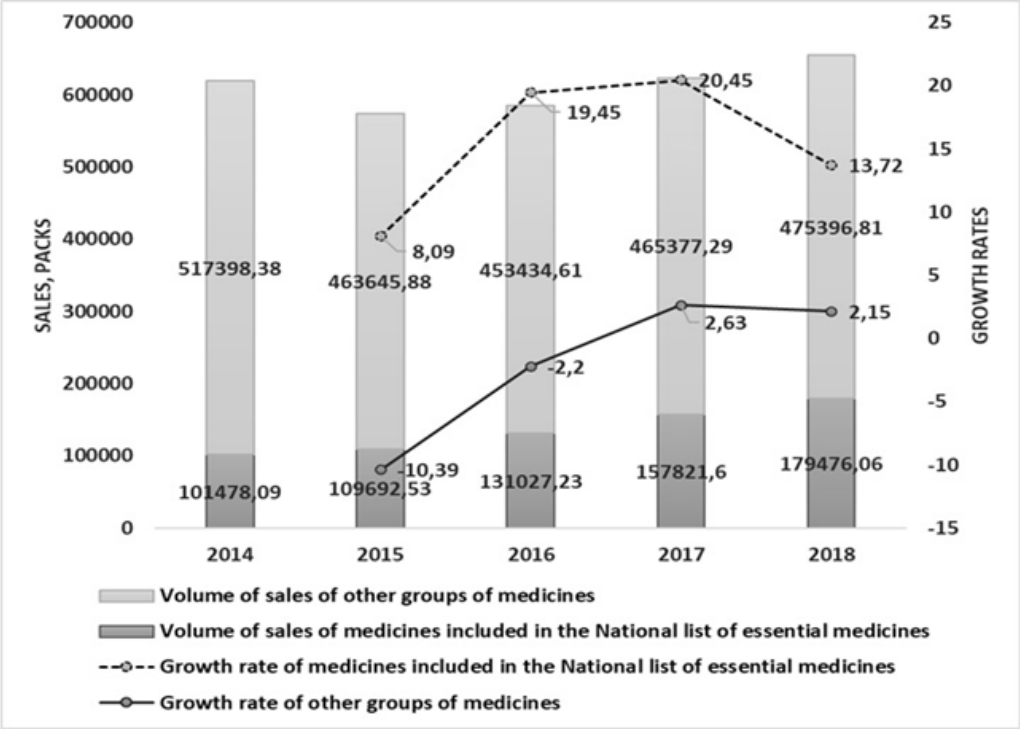

Fig. 3. Dynamics of indicators of sales volumes in physical terms of drugs included in the NLEM and other medicines.

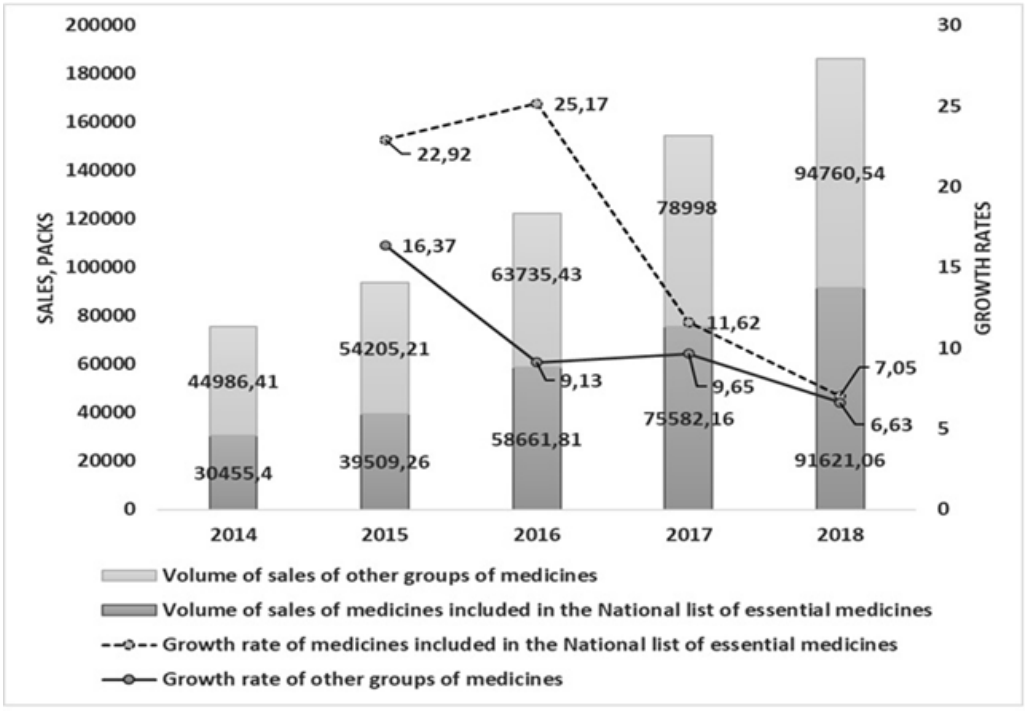

Fig. 4. Dynamics of indicators of sales volumes in physical terms of drugs included in the NLEM and other medicines.

Conclusions. 1. According to the results of a retrospective analysis of the consumption of medicines during 2014–2018, it was found that the volume of retail sales of medicines had a characteristic upward trend. It is proved that in the period 2014–2018, retail sales of medicines increased in cash by 29.56 % and in natural terms by 98.2 %.

2. The conducted analysis of the consumption of medicine in natural indicators showed that in 2015 and 2018 there is a negative tendency to decrease the volume

of retail sales of anti-Parkinson medicines in the natural dimension. And also, the fact that biperiden was introduced in the retail pharmaceutical market in the 2017, which negatively affected the average growth rate in 2018.

3. According to the results of the analysis of retail sales of medicines in cash, it was established that during 2014–2017 a positive trend of growth of the value of the rate indicator was observed (GR_{2015} = 14.71 %; GR_{2016} = 53.25 %). At the same time, in 2018, there is a tendency to decrease the value of the average growth rate (GR_{2018} = -1.76 %). It was proved that in 2018, only 4 medicine INN had a positive trend of increasing sales in monetary terms, namely: levodopa, decarboxylase inhibitors and COMT inhibitor (GR = 31.95 %), pramipexole (GR = 16.30 %) , levodopa with decarboxylase inhibitors (GR 2018 = 9.92 %), amantadine (GR = 9.30 %).

4. The analysis of the growth rates of retail sales in terms of domestic and foreign pharmaceutical production showed negative changes in the dynamics of domestic sales of natural products in physical terms. Thus, the number of packs of domestic medicines sold in 2018 decreased by 1.86 % compared to 2014. It is proved that the growth rate of domestic medicines in monetary terms tended to increase. This fact indicates that retail prices for antiparkinson medicines are rising. It is established that a greater volume of sales in monetary units is provided by foreign production medicines – 92.4 % of the total sales in 2014–2018.

5. It is proved that the number of sold packages of medicines included in the NLEM in 2018 increased by 76.86 % compared to 2014. At the same time, the number of sold packages of medicines that are not listed in the NLEM decreased in 2018. at 8.12 %. Compared to 2014, it is established that the largest volume of sales in monetary units is provided by non-national medicines – 53.2 % of the total sales.

6. According to the results of the analysis, data on the use of medicines for the treatment of Parkinson's disease were systematized and the main problems and prospects for the development of this segment of the domestic market were identified.

Conflict of interest: authors have no conflict of interest to declare.

Конфлікт інтересів: відсутній.

АНАЛІЗ ПОКАЗНИКІВ СПОЖИВАННЯ ЛІКАРСЬКИХ ПРЕПАРАТІВ ДЛЯ ЛІКУВАННЯ ХВОРОБИ ПАРКІНСОНА В УКРАЇНІ

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Мета роботи. Визначення особливостей і тенденцій щодо споживання лікарських препаратів для лікування хвороби Паркінсона в натуральному та грошовому вимірах за 2014–2018 рр.

Матеріали і методи. Для досягнення даної мети використовували методи: логічний, системно-аналітичний, порівняльний аналіз та узагальнення інформації.

Результати й обговорення. За результатами ретроспективного аналізу споживання лікарських препаратів протягом 2014–2018 рр. встановлено, що обсяг роздрібного продажу лікарських засобів мав характерну тенденцію зростання. Аналіз темпів приросту роздрібного продажу в розрізі лікарських засобів вітчизняного та іноземного виробництва показав негативні зміни динаміки продажу вітчизняних лікарських засобів у натуральному вимірі. Доведено, що кількість реалізованих упаковок лікарських препаратів, які входять до Національного переліку основних лікарських засобів, у 2018 р. збільшилась на 76,86 % порівняно з 2014 р. Одночасно кількість проданих упаковок лікарських препаратів, які не зазначені у Національному переліку основних лікарських засобів, зменшилася у 2018 р. на 8,12 %.

Висновки. Результати проведеного аналізу показників обсягу продажу лікарських засобів для лікування хвороби Паркінсона вказують на превалювання препаратів іноземного виробництва над вітчизняними у грошовому та натуральному вимірах і визначено основні проблеми та перспективи для розвитку даного сегмента вітчизняного ринку.

Ключові слова: хвороба Паркінсона; темпи приросту; протипаркінсонічні лікарські засоби; показники споживання; фармацевтичний ринок.

АНАЛИЗ ПОКАЗАТЕЛЕЙ ПОТРЕБЛЕНИЯ ЛЕКАРСТВЕННЫХ ПРЕПАРАТОВ ДЛЯ ЛЕЧЕНИЯ БОЛЕЗНИ ПАРКИНСОНА В УКРАИНЕ

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Цель работы. Определение особенностей и тенденций по потреблению лекарственных препаратов для лечения болезни Паркинсона в натуральном и денежном измерениях с 2014–2018 гг.
Материалы и методы. Для достижения данной цели использовались методы: логический, системно-аналитический, сравнительный анализ и обобщение информации.
Результаты и обсуждения. По результатам ретроспективного анализа потребления лекарственных препаратов в течение 2014–2018 гг. установлено, что объем розничных продаж лекарственных средств имел характерную тенденцию роста. Анализ темпов прироста розничных продаж в разрезе лекарственных средств отечественного и иностранного производства показал негативные изменения динамики продаж отечественных лекарственных средств в натуральном измерении. Доказано, что количество реализованных упаковок лекарственных препаратов, входящих в Национальный перечень основных лекарственных средств, в 2018 г. увеличилась на 76,86 % по сравнению с 2014 г. Одновременно количество проданных упаковок лекарственных средств, не указанных в Национальном перечне основных лекарственных средств, уменьшилось в 2018 г. на 8,12 %.
Выводы. Результаты проведенного анализа показателей объема продаж лекарственных средств для лечения болезни Паркинсона указывают на преобладание препаратов иностранного производства над отечественными в денежном и натуральном измерениях и определены основные проблемы и перспективы для развития данного сегмента отечественного рынка.

Ключевые слова: болезнь Паркинсона; темпы прироста; противопаркинсонические лекарственные средства; показатели потребления; фармацевтический рынок.

Список бібліографічних посилань

1. 11 квітня — Всесвітній день боротьби з хворобою Паркінсона. URL: https://phc.org.ua/news/11-kvitnya-vsesvitniy-den-borotbi-z-khvoroboyu-parkinsona (дата звернення: 30.04.2020)
2. Про державні гарантії медичного обслуговування населення : Закон України від 19 жовтня 2017 р. № 2168 URL: https://zakon.rada.gov.ua/laws/show/2168-19 (дата звернення: 10.03.2020)
3. Національний перелік основних лікарських засобів / М-во охорони здоров'я URL: moz.gov.ua/uploads/0/290-nacionalnij_perelik_osnovnih_likarskih_zasobiv.pdf. (дата звернення: 15.03.2020)
4. Котвіцька А. А., Лобова І. О. Аналіз споживання нейропротекторних лікарських засобів для лікування ішемічного інсульту в україні. *Управління, економіка та забезпечення якості в фармації*. 2013. № 5. С. 49–58.
5. Дослідження фармацевтичного ринку України аналітичної компанії «Фармстандарт» компанії «Моріон». URL: http://www.pharmstandart.com.ua/login (дата звернення: 10.02.2020)
6. Котвіцька А. А., Прокопенко О. С. Моніторинг показників фізичної та соціально-економічної доступності лікарських засобів, які застосовуються у лікуванні хвороби Паркінсона. *Управління, економіка та забезпечення якості в фармації*. 2019. № 3. С. 55–63.
7. ATC/DDD Index 2020. веб-сайт. URL: https://www.whocc.no/atc_ddd_index/
8. Левицька О. Р., Громовик Б. П. Порівняльний аналіз споживання лікарських засобів пацієнтами з гострими порушеннями мозкового кровообігу у закладах охорони здоров'я стаціонарного типу. *Клінічна фармація, фармакотерапія та медична стандартизація*. 2015. № 3-4. С. 70–76.
9. Ткачова, О. В., Сілаєв А. О., Шептак Т. І. Аналіз споживання противірусних лікарських засобів на фармацевтичному ринку України, які використовуються для фармакотерапії хворих на гострі респіраторні вірусні інфекції. *Український біофармацевтичний журнал*. 2018. № 1. С. 35–40. DOI: 10.24959/ubphj.18.161

References

1. 11 kvitnia — Vsesvitnii den borotby z khvoroboiu Parkinsona [Internet]. Tsentr hromadskoho zdorovia MOZ Ukrainy. [cited 2020April30]. Available from: https://phc.org.ua/news/11-kvitnya-vsesvitniy-den-borotbi-z-khvoroboyu-parkinsona
2. Zakon Ukrainy «Pro derzhavni harantii medychnoho obsluhovuvannia naselennia» [Internet]. Zakonodavstvo Ukrainy. [cited 2020Mar10]. Available from: https://zakon.rada.gov.ua/laws/show/2168
3. Natsionalnyi perelik osnovnykh likarskykh zaso-

biv [Internet]. Ministerstvo okhorony zdorovia. 2017 [cited 2020Mar15]. Available from: moz.gov.ua/uploads/0/290-nacionalnij_perelik_osnovnih_likarskih_zasobiv.pdf
4. Kotvitscka AA, Lobova IO. Analiz spozhyvannia neiroprotektornykh likarskykh zasobiv dlia likuvannia ishemichnoho insultu v ukraini. Upravlinnia, ekonomika ta zabezpechennia yakosti v farmatsii. 2013;5(31):49–58.
5. Doslidzhennia farmatsevtychnoho rynku Ukrainy analitychnoi kompanii «Farmstandart» kompanii «Morion». [cited 2020Feb10]. Available from: http://www.pharmstandart.com.ua/login
6. Kotvitska AA, Prokopenko OS. Monitoring of indicators of physical and socio-economic availability of medicines used for Parkinson's disease treatment. Upravlìnnâ, ekonomìka ta zabezpečennâ âkostì v farmacìï. 2019;0(3 (59):55–63.
7. WHOCC ATC/DDD Index 2020 [Internet]. WHOCC. [cited 2020Feb15]. Available from: https://www.whocc.no/atc_ddd_index/
8. Levytska OR, Hromovyk BP. Porivnialnyi analiz spozhyvannia likarskykh zasobiv patsiientamy z hostrymy porushenniamy mozkovoho krovoobihu u zakladakh okhorony zdorovia statsionarnoho typu. Klinichna farmatsiia, farmakoterapiia ta medychna standartyzatsiia. 2015;(3-4):70–6.
9. Tkachova OV, Silaev AO, Sheptak TI. Analysis of antiviral drugs consumption on the pharmaceutical market of ukraine which are used for pharmacotherapy in arvi patients. Ukraïns'kij bìofarmacevtičnij žurnal. 2018;0(1(54):35–40.

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