СОЦІАЛЬНИЙ МАРКЕТИНГ ТА ФАРМАКОЕКОНОМІЧНІ ДОСЛІДЖЕННЯ

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TRENDS IN THE NOOTROPIC DRUGS MARKET IN THE REPUBLIC OF UZBEKISTAN

The increasing incidence of cerebrovascular and cognitive disorders in Uzbekistan, driven by a growing information load and an aging population, has led to a heightened demand for effective nootropic medications. The pharmaceutical market is adapting to this demand through a diversified range of drugs, including both imported and domestically produced products.

Aim. This study aims to evaluate the dynamics of the nootropic drug market in the Republic of Uzbekistan from 2015 to 2024 in both physical and monetary terms, including the analysis of import volumes, domestic production, key market players, dosage forms, and trends in international nonproprietary names.

Materials and methods. The study utilized aggregated data on the registration, import, and production of nootropic drugs classified under ATC group N06BX. Marketing analysis methods and qualimetric tools were applied to identify quantitative trends, structural shifts over the study period.

Results and discussion. The article presents an analysis of the dynamics of the nootropic drug market in the Republic of Uzbekistan over the period 2015–2024. It examines quantitative changes in both physical and monetary terms, as well as the structure of imports and domestic production. Key trends are identified, including an increase in nootropic consumption up to 2022 followed by a subsequent decline, the strengthening of domestic manufacturers' positions, and changes in the assortment and consumption structure by international nonproprietary names. A comparative analysis of supplies from CIS and non-CIS countries is provided, along with an evaluation of the activity of leading domestic companies. Particular attention is given to dosage forms. The findings of the study may be used to assess the current state of the pharmaceutical market and to inform strategic planning for the development of the nootropic drug sector in Uzbekistan.

Conclusions The nootropic drug market in Uzbekistan shows cyclical dynamics with strong domestic development potential. Market fluctuations reflect clinical guideline revisions and increased emphasis on evidence-based prescribing. The study highlights the growing role of local manufacturers and the shift toward more complex and effective nootropic formulations.

Keywords: nootropic drugs; drug market; import; production; pharmaceutical market; Uzbekistan; marketing analysis.

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ТЕНДЕНЦІЇ НА РИНКУ НООТРОПНИХ ПРЕПАРАТІВ У РЕСПУБЛІЦІ УЗБЕКИСТАН

Зростання захворюваності на цереброваскулярні та когнітивні порушення в Узбекистані, викликане інформаційним перевантаженням та старінням населення, зумовило підвищений попит на ефективні ноотропні препарати. Фармацевтичний ринок адаптується до цього запиту шляхом розширення асортименту як імпортних, так і вітчизняних лікарських засобів.

Мета — оцінка динаміки ринку ноотропних препаратів у Республіці Узбекистан у 2015–2024 рр. як у натуральному, так і в грошовому вираженні, разом з аналізом обсягів імпорту, вітчизняного виробництва, основних гравців ринку, лікарських форм та змін у структурі за міжнародними непатентованими назвами (МНН).

Матеріали та методи: використано агреговані дані щодо реєстрації, імпорту та виробництва ноотропних препаратів, класифікованих за групою АТС N06BX; застосовано методи маркетингового аналізу та кваліметричні підходи для виявлення кількісних тенденцій і структурних змін.

Результати та їхнє обговорення. У статті наведено аналіз динаміки ринку ноотропних лікарських засобів у Республіці Узбекистан за період 2015–2024 рр. Розглянуто кількісні зміни як у фізичних, так і в

грошових показниках, а також структуру імпорту та вітчизняного виробництва. Визначено основні тенденції, зокрема зростання споживання ноотропних препаратів до 2022 року з подальшим зниженням, зміцнення позицій вітчизняних виробників, а також зміни в асортименті та структурі споживання за МНН. Проведено порівняльний аналіз постачань з країн СНД та інших країн, а також оцінку діяльності провідних вітчизняних компаній. Особливу увагу приділено лікарським формам. Результати дослідження можуть бути використані для оцінювання поточного стану фармацевтичного ринку і для стратегічного планування розвитку сектору ноотропних лікарських засобів в Узбекистані.

Висновки. Ринок ноотропних препаратів в Узбекистані демонструє циклічну динаміку з високим потенціалом вітчизняного розвитку. Коливання обсягів ринку відображають перегляд клінічних рекомендацій та посилення акценту на призначенні препаратів на основі доказів. Дослідження підкреслює зростаючу роль місцевих виробників та перехід до складніших та ефективніших форм лікування.

Ключові слова: ноотропні ліки; ринок ліків; імпорт; виробництво; фармацевтичний ринок; Узбекистан; маркетинговий аналіз.

Introduction. The modern pace of life is accompanied by an ever-increasing volume of information that must be processed and retained, placing considerable strain on the human nervous system. As a result, there has been a notable rise in the incidence of cerebrovascular disorders. In the Republic of Uzbekistan, the prevalence of cerebrovascular pathologies is growing by an estimated 6.8% annually [1].

Against this backdrop, there is a growing need for pharmacological agents that enhance cognitive function and cerebral blood flow while minimizing adverse effects. Nootropic drugs (NDs) meet these criteria and have therefore garnered increasing attention.

According to the World Health Organization (WHO), nootropics are substances that enhance learning, improve memory and mental performance, and increase the brain's resistance to stress, hypoxia, and other harmful influences [2].

Nootropic agents are used in the treatment of disorders involving memory, learning, and consciousness, including acute psychoorganic syndrome (APS), which can result from trauma, stroke, intoxication, and other causes. In some cases, APS may progress to dementia [3–7].

The nootropic drug market in Uzbekistan has shown marked growth in recent years. The number of registered nootropic medications increased from 148 in 2018 to 211 in 2022. At the same time, the share of domestically produced drugs rose from 31.8% to 41.23%. Overall, the pharmaceutical market is expanding rapidly: from September 2023 to September 2024, sales increased by 13%, reaching 20.345 trillion soums. By 2026, the government aims to raise the share of domestically produced pharmaceuticals to 80%, with nootropic drugs playing a significant role in this strategy [1, 2, 8].

Approaches to the use of nootropics vary widely across countries. International clinical guidelines, such as those issued by the American Academy of Neurology (AAN) and the UK's National Institute for Health and Care Excellence (NICE), highlight the limited evidence supporting the efficacy of most nootropic agents. Specifically, medications such as piracetam, ginkgo biloba, and citicoline are not recommended for the treatment of dementia or cognitive impairment due to insufficient clinical effectiveness [9-12].

In contrast, nootropics remain widely used in clinical practice across many post-Soviet countries – these agents are included in official clinical guidelines for the management of chronic cerebral ischemia, post-stroke cognitive impairment, and the consequences of traumatic brain injury [12-16].

In Uzbekistan, nootropic drugs are routinely prescribed. According to directives from the Ministry of Health of the Republic of Uzbekistan, these agents are included in treatment protocols for cerebrovascular diseases, encephalopathies of various origins, and vegetative-vascular dystonia. They are also used in combination therapy for children with delayed psychomotor development and cerebroasthenic syndrome. Frequently prescribed nootropics include piracetam, cerebrolysin, mexidol, vinpocetine, and citicoline [15, 16].

Nootropic drugs in Uzbekistan are not subject to strict regulatory oversight, which

contributes to their wide availability. However, despite their widespread use, the lack of systematic reviews and large-scale randomized controlled trials (RCTs) conducted in the country hinders a comprehensive evaluation of their efficacy in local clinical settings. Nevertheless, national guidelines are increasingly promoting the rational prescription of these agents in line with international standards of evidence-based medicine [15, 16].

In conclusion, the clinical use of nootropics in Uzbekistan and other CIS countries reflects longstanding therapeutic traditions. However, to optimize patient outcomes, greater integration of contemporary scientific evidence and robust clinical research is essential. As the market for nootropic drugs in Uzbekistan continues to grow, national efforts are focusing on import substitution and meeting the increasing demand for this class of pharmaceuticals.

Aim of the work: The aim of this study is to assess the dynamics of the nootropic drug market in the Republic of Uzbekistan in both monetary and physical terms over the period 2015–2024, with a focus on import and domestic production volumes, assortment structure by international nonproprietary names (INNs), dosage forms, and the role of leading manufacturers.

Materials and methods: The study utilized aggregated data on imports and domestic production for the period from 2009 to 2024. It included drugs used in the treatment of cerebrovascular diseases that fall under the pharmacotherapeutic group N06BX — other psychostimulants and nootropic agents, according to the ATC classification.

Qualimetric methods were applied in the course of the study, along with marketing analysis techniques to examine the range of nootropic drugs.

Results obtained. At the initial stage of this study, a comprehensive analysis of the registered range of nootropic drugs (NDs) was conducted to evaluate market trends and regulatory dynamics. The findings revealed a significant increase in the number of registered trade names (TNs) for nootropic drugs, rising from 115 in 2014 to 199 in 2024. The overall trend indicates predominantly stable growth in the registration of nootropic drugs. However, two distinct periods of sharp increases were identified, suggesting potential shifts in market demand, regulatory adjustments, or strategic changes within the pharmaceutical industry.

The first surge occurred in 2016, when the total number of registered nootropic TNs increased from 112 in 2015 to 143 in 2016, representing a rise of 31 TNs. This growth may be attributed to the introduction of new formulations, modifications in healthcare policies, or increased investment in the sector. The second substantial increase was observed in 2021, with the number of TNs rising by 31 compared to 2020. The highest recorded number of registered TNs was in 2022, reaching 206, underscoring the continued expansion of the nootropic drug market.

The study revealed that the initial growth phase was marked by a significant increase in market volume, rising from 4.33 million packages in 2015 to 7.25 million packages in 2018. This growth of 2.92 million packages (approximately 67.5%) over three years indicates an active market expansion, potentially driven by several factors:

- growing interest in nootropic therapy in clinical practice, particularly in neurology, psychiatry, and gerontology;
- registration of new drugs and diversification of the product range;
- increased purchasing power among the population and active pharmaceutical marketing.

Following the peak of 7.25 million packages in 2018, the market experienced a decline to 6.452 million packages in 2019. This decrease of 798 thousand packages (~11%) may reflect market saturation, changes in government procurement volumes, or heightened competition from alternative therapeutic groups.

Subsequently, the market volume rebounded, increasing from 6.452 million packages in 2019 to a historical peak of 9.468 million packages in 2022. However, after reaching this peak, the volume began to Physicians may have reduced the prescription

of certain nootropic agents due to a lack of sufficient evidence supporting their efficacy, or shifted toward combination therapy involving drugs from other pharmacological classes (fig. 1).

Physicians may have reduced the prescription of certain nootropic agents due to a lack of sufficient evidence supporting their efficacy, or shifted toward combination therapy involving drugs from other pharmacological classes (fig. 1). Throughout the period under review, the CIS countries remained the primary source of nootropic drug imports. Import volumes from these countries fluctuated, reaching a minimum of 1.96 million packages in 2017 and a maximum of 3.93 million packages in 2022. After 2022, a decline was observed, with imports decreasing to 3.22 million packages by 2024.

In contrast, imports from non-CIS countries showed steady and gradual growth over the same period, increasing from 1.27 million packages in 2015 to 3.08 million packages in 2024.

Uzbekistan had the lowest volume of domestically produced nootropic drugs in 2015, with only 761 thousand packages. From 2016 to 2023, domestic production grew rapidly, peaking at 3.08 million packages in 2023. However, in 2024, there was a sharp decline—almost a 50% reduction—to 1.63 million packages. This sudden drop may be attributed to internal

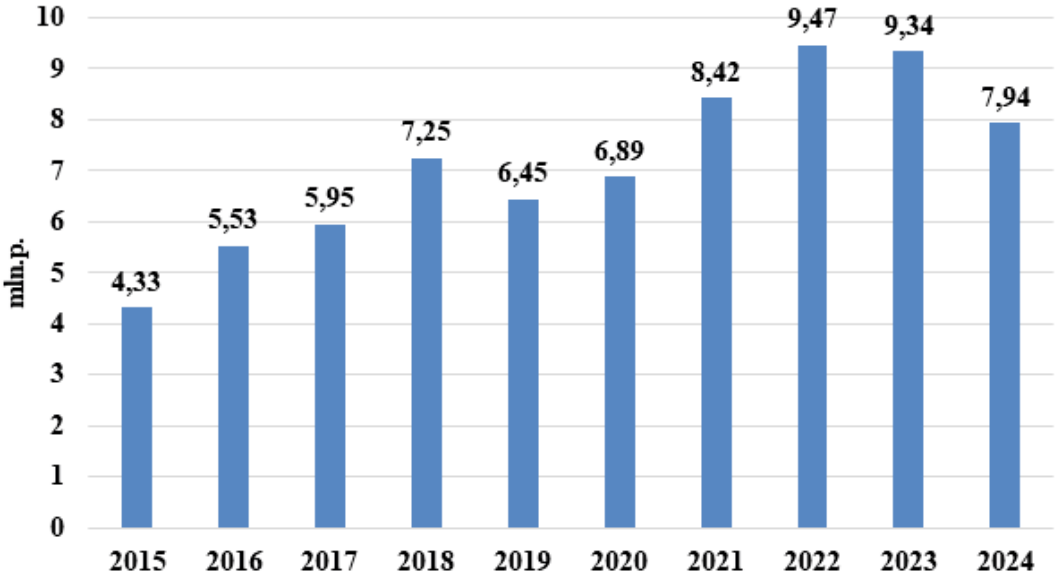

Figure 1. Total number of received nootropic drugs in physical terms for the period from 2015 to 2024

Uzbekistan ranks first as the largest supplier, having reached a peak volume of 3.08 million packages in 2023. However, this figure declined sharply to 1.63 million packages in 2024. Russia holds second place, with import volumes showing significant growth from 2017 to 2022 and peaking at 2.32 million packages in 2022. In 2021, the volume stood at 2.26 million packages. Belarus supplied 0.897 million packages in 2023, representing its highest level of exports to Uzbekistan during the study period. Ukraine recorded its peak in 2022, with 0.729 million packages delivered. Hungary's highest export volume was observed in 2017, reaching 0.649 million packages.

An analysis of domestic manufacturers revealed that Merrimed Pharm has maintained a position of consistent leadership throughout the study period. Since 2016, the company has demonstrated rapid growth in production, peaking at 1.163 million packages

the study period. Ukraine recorded its peak in 2022, with 0.729 million packages delivered. Hungary's highest export volume was observed in 2017, reaching 0.649 million packages.

An analysis of domestic manufacturers revealed that Merrimed Pharm has maintained a position of consistent leadership throughout the study period. Since 2016, the company has demonstrated rapid growth in production, peaking at 1.163 million packages in 2018. After a temporary decline in 2022, production volumes increased again in 2023 to 0.998 million packages, possibly reflecting expanded production capacity or rising market demand.

Radix exhibited noticeable growth in the early period (2015–2016), followed by a decline beginning in 2017. However, a recovery in production has been observed since 2021, reaching 0.349 million packages by 2024.

Jurabek Laboratories entered the market in 2019. Its highest production volume was recorded in 2020 at 0.699 million packages, followed by a gradual decline, likely due to market saturation or a redistribution of demand.

Several new manufacturers—Temur Med Pharm, Serene Healthcare, Aseptika, Bayan Medical, and Reka-Med Pharm—appeared after 2019. Their emergence reflects growing interest in domestic pharmaceutical production and possibly increased government support for local enterprises. Among these, Temur Med Pharm was the most successful, with output rising from 0.591 million packages in 2020 to 1.001 million in 2024.

Manufacturers such as Aseptika and Serene Healthcare operate on a smaller scale but exhibit positive growth dynamics, which may indicate specialization in niche products or early-stage business expansion.

Remedi Group, active since 2015, has shown fluctuations in production volume, peaking at 0.554 million packages in 2021, followed by a decline. These changes may be due to internal restructuring, shifts in product portfolio, or evolving market conditions.

Mediopharm has maintained a modest but stable presence in the market, with its highest production level in 2021 (0.88 million packages), after which a downward trend was observed.

Throughout the analyzed period, piracetam consistently held the leading market share based on supply volumes, ranging from 31.50% to 35.78%. The market

Table 1

CHANGES IN THE VOLUME OF SUPPLIES OF NOOTROPIC DRUGS IN PACKAGES BY COUNTRY GROUPS IN 2015–2024

Countries / Year	CIS countries (mln pack)	Other countries (mln pack)	Uzbekistan (mln pack)
2015	1.27	2.30	0,76
2016	1,41	2.25	1.88
2017	1.54	1.96	2.45
2018	1.79	2.70	2.76
2019	2.01	2,19	2.25
2020	2.31	2.46	2,12
2021	2.09	3.32	3.02
2022	2.47	3.93	3.07
2023	2.45	3.81	3.08
2024	3.09	3.22	1.64

share of Peptid Complex increased from 8.31% in 2020 to 11.90% in 2024, with peak levels observed in 2021 and 2023. In contrast, citicoline, which initially accounted for a significant share (14.50% in 2020), showed a declining trend, stabilizing around 11% by 2024.

A sudden increase in the supply volume share of gamma-amino-beta-phenylbutyric acid in 2023 (16.60%) suggests the introduction of a new product or the repurposing of an existing formulation. Furthermore, the rising demand for combination nootropic drugs—such as piracetam + tiotriazoline, citicoline + arginine hydrochloride, and others—indicates a growing trend toward the use of complex formulations, potentially due to their enhanced therapeutic efficacy (Tab. 2).The solution in ampoules has been the dominant dosage form throughout the decade. The volume of ampoule solutions increased from 2.66 million packages in 2015 to a peak of 5.63 million packages in 2022, followed by a moderate decline to 5.29 million packages in 2024. This dosage form leads the market, likely due to its widespread use in hospitals, the rapid onset of action with parenteral administration, and the established trust in injection forms in clinical practice in Uzbekistan.

After a decline in tablet sales in 2016 (0.795 million packages), there was a notable increase, peaking at 1.862 million packages in 2021, followed by a subsequent decrease to 1.332 million packages in 2024.

Powdered forms showed steady growth, with a temporary decline in 2024. The volume increased from 0.121 million packages in 2015 to a peak of 0.962 million packages in 2023, after which it declined to 0.673 million packages in 2024. This growth may be attributed to the rising popularity of fast-acting formulations that can be dissolved, particularly in pediatric and geriatric populations (Tab. 3).

Conclusions

1. The nootropic drug market in Uzbekistan demonstrates an overall growth trend, reaching a peak of 9.468 million packages in 2022. However, a gradual decline in volumes is observed in 2023–2024, with sales dropping to 7.944 million packages. This decrease may be attributed to changes in clinical recommendations and a growing preference for combination therapy.

Table 2

MARKET SHARE OF THE TOP-10 INN NOOTROPIC DRUGS IN THE PHARMACEUTICAL MARKET OF UZBEKISTAN (2020-2024)

INN	Market share, %				
	2020	2021	2022	2023	2024
Pirates	31.50	33.37	35.78	32.38	33.23
Peptide complex	8.31	10.66	7.83	11.87	11.90
Citicoline	14.50	14.08	13.86	10.28	11.72
Vinpocetine	9.41	4.63	4.84	2.94	11.58
Gamma-amino-beta-phenyloil acid hh	0.00	0.00	0.00	16.60	7.35
Piracetam, tiotriazoline	5.08	4.64	6.94	5.18	7.02
Hopantenic acid	4.25	4.08	5.37	5.61	5.51
Ginko biloba, centell, herpes monnier, coriander	4.03	2.02	1.7	3.40	4.08
Hypothalamic phospholipids	0.05	0.25	0.50	0.67	1.94
Citicoline, arginine hydrochloride	0.00	0.00	0.42	0.85	1.01

sales dropping to 7.944 million packages. This decrease may be attributed to changes in clinical recommendations and a growing preference for combination therapy.

2. While imports from both CIS and other countries have remained stable, domestic production significantly increased from 2016 to 2023. However, it nearly halved in 2024, which may indicate internal changes within the country's pharmaceutical sector.

3. The leading supplier countries in

Table 3

ANALYSIS OF THE DYNAMICS OF DOSAGE FORMS OF NOOTROPIC DRUGS ON THE PHARMACEUTICAL MARKET OF UZBEKISTAN (2015 – 2024)

Dosage Form	Sales volume, million packages									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Solution (ampoule)	2,66	4,04	4,08	4,74	4,20	4,04	5,26	5,63	5,59	5,29
Tablet	1,04	0,80	1,23	1,50	1,13	1,72	1,86	1,78	1,76	1,33
Powder	0,12	0,24	0,23	0,31	0,43	0,43	0,63	0,78	0,96	0,67
Syrup	0,09	0,13	0,13	0,23	0,23	0,23	0,14	0,31	0,43	0,34
Capsule	0,39	0,30	0,26	0,44	0,44	0,45	0,50	0,91	0,54	0,28
Drops	0,00	0,00	0,01	0,01	0,01	0,01	0,01	0,03	0,01	0,01
Concentrate	0,00	0,00	0,00	0,02	0,01	0,01	0,02	0,02	0,03	0,01
Lyophilizate	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01
Granule	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,01	0,00
Sachet	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Suspension	0,03	0,01	0,02	0,01	0,00	0,00	0,00	0,00	0,00	0,00

2024 were Uzbekistan, Russia, Belarus, Hungary, and Ukraine. Although Uzbekistan had previously held the leading position, its share decreased significantly in 2024.

4. Among domestic producers, Merrimed Pharm stands out as the leader, consistently demonstrating stable production volumes. Notable growth was also observed in emerging companies such as Temur Med Pharm, Aseptika, and Serene Healthcare, indicating the expansion of domestic pharmaceutical production.

5. Piracetam continues to dominate the market, maintaining a share between 33% and 36%. In contrast, the shares of Citicoline and Peptid Complex show fluctuations. The introduction of gamma-amino-beta-phenylbutyric acid led to a sharp increase in interest in 2023 (16.6%), though its share decreased to 7.35% in 2024.

6. The highest demand is for injection forms (solutions in ampoules), which maintain a stable leadership in terms of volume. Tablet and powder forms also remain in demand, although their volumes fluctuate from year to year.

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Authors' contribution.
D.U. Saydalieva was responsible for the conception and design of the study, data analysis, and interpretation of results.
N.M.U.Sultanbaeva contributed to data collection, literature review, and drafting of the manuscript.
Both authors participated in the critical revision of the text and approved the final version of the article for submission.
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