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ACTIVE SUBSTANCES ANALYSIS OF ANTIGISTAMINE MEDICINES OF THE REPUBLIC OF UZBEKISTAN

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ABSTRACT

The relevance of this study is explained by the expanding range of antihistamines in the pharmaceutical market of the Republic of Uzbekistan and the need for an in-depth study of the market structure by analyzing them under international non-proprietary names (INN). The increasing variety of antihistamines in modern medical practice requires an assessment of their effectiveness and application characteristics. Statistical analysis, comparative analysis, and dynamic series analysis were used as the leading methods for studying the problem. The scientific novelty of the study lies in the fact that, for the first time in the pharmaceutical market of Uzbekistan, a systematic analysis of the structure of antihistamines by INN was conducted, and the growth trend of the combined drug segment was scientifically substantiated. The authors revealed the main active ingredients of antihistamine drugs, their dynamics over the years, and their market share, identified the growth trend of combined drugs, and substantiated the significance of modern drugs. The practical significance of the results obtained lies in the fact that this analysis can be applied in the pharmaceutical industry to optimize the range, increase the efficiency of drug selection, and form marketing strategies. Theoretical significance is manifested in the scientific understanding of the development trends of antihistamines and serves as a basis for future research.

Introduction. Today, allergic diseases, particularly allergic rhinitis, urticaria, dermatitis, and food allergies, are becoming widespread worldwide. Allergic rhinitis is one of the most common chronic diseases, with various sources reporting an incidence of approximately 10–30% in adults and

even higher in children. Also, the increase in allergic and chronic respiratory diseases further increases the need for antihistamines used in their effective treatment [1].

The expansion of the pharmaceutical market in the Republic of Uzbekistan, the increase in the nomenclature of medicines, and the occurrence of the same active substances under different trade names in practice make it important to study antihistamines specifically from the perspective of the active substance. This is because drugs belonging to the same therapeutic group differ in composition, generation, efficacy, side effects, and ease of use. The maintenance of the State Register of drugs authorized for use in medical practice in Uzbekistan also makes this topic practically relevant: it allows for the systematization of antihistamines on the market, their grouping by active ingredients, and their comparative assessment [2].

Another important aspect of this topic is that antihistamines are used very frequently in clinical practice, and often when choosing them, a doctor, pharmacist, or patient must rely on the pharmacological properties of the active substance rather than the trade name. In particular, there are significant differences between first- and second-generation antihistamines in terms of their sedative effect, impact on daily activities, safety level, and long-term use possibilities. Therefore, the analysis of antihistamines registered in Uzbekistan by active ingredients is necessary for practical healthcare, rational pharmacotherapy and improving the quality of pharmaceutical advice.

Furthermore, in pharmaceutical practice, the fact that the same active substance is presented by different manufacturers and under different trade names can cause confusion when choosing a drug. Therefore, the study of antihistamines in the context of active ingredients creates a scientific basis for assessing their range, determining their market share, identifying the most common molecules, and conducting future clinical and economic analyses. Therefore, the topic of analyzing antihistamines by active ingredients in the Republic of Uzbekistan is relevant from scientific, practical, and pharmaceutical perspectives.

Purpose of the study: Based on the data of the State Register of Medicines and Medical Devices of the Republic of Uzbekistan, quantitative analysis of antihistamine drugs under the INN and determination of their dynamics.

Research materials and methods: Data from the State Register of Medicines and Medical Devices of the Republic of Uzbekistan for the period 2013–2025 were used [3, 4]. As a research method, one of the previously tested methods for studying the pharmaceutical market—content analysis—was applied [5, 6].

Results. An analysis of the structural composition of antihistamines by active ingredients for 2013–2025 shows that although certain changes were observed in the market structure during this period, general trends remained stable. The largest share was occupied by diphenhydramine in the early years, which accounted for 13–16% between 2013 and 2017. Especially in

2017, this figure reached its highest level at 16%. However, in recent years, the share of this active substance has been steadily decreasing, reaching around 6–8% by 2023–2025. This situation is might be explained by the widespread introduction into practice of modern drugs with fewer side effects.

At the same time, the proportion of chloropyramine remained relatively stable during the analyzed period. In the early years, its share ranged from 4 to 6%, but since 2020, there has been a slight increase, reaching 7%. This indicates that this drug maintains its significance in clinical practice.

Mebhydroline also occupies an important place among antihistamines, maintaining a stable share of around 5–6% for many years. Although a short-term decline (4%) was observed in 2021, an upward trend was again noted in subsequent years, reaching 7% in 2023–2024. This indicates that the practical significance of this drug remains.

The proportion of other active substances, including dimethinden, doxylamine, and similar preparations, was relatively small, mainly ranging from 1 to 3%. Nevertheless, in some years, there is a slight increase in their share, which indicates that the market is diversifying, that is, the demand for various drugs is growing.

The share of drugs such as clemastin and dimenhydrinate remained at a very low level, mainly around 1%. Only in some years, specifically in 2022, is a short-term increase in the proportion of dimenhydrinate observed, which may be related to certain clinical needs. Promethazine, on the other hand, has a very small share throughout the entire period, indicating its limited use (Fig. 1).

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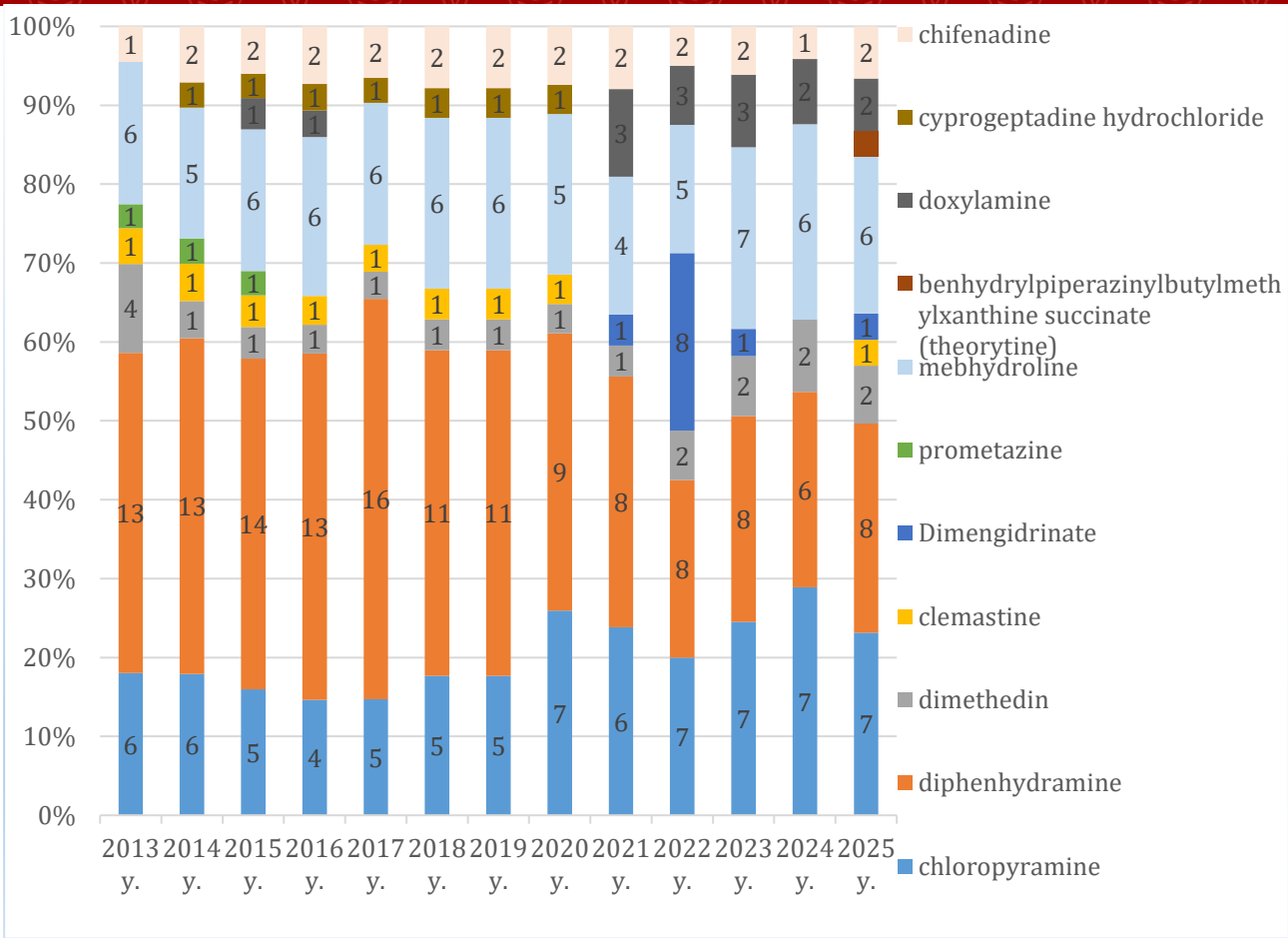


Figure 1. Analysis of active ingredients of antihistamine drugs (1st generation) according to the State Register of Medicines and Medical Devices of the Republic of Uzbekistan, in percentage terms (2013–2025)

In the marketing analysis of the pharmaceutical market, one of the crucial indicators is the study of active ingredient predominance under the INN of a medicinal product. This approach allows for the identification of the actual structure of the pharmaceutical market and the assessment of the actual composition of drugs offered under various trade names. It should be noted that regardless of the marketing activities, advertising strategies, and brand policies of pharmaceutical companies, the final decision-makers—doctors and pharmacists—rely primarily on its INN, i.e., the active ingredient, when choosing medication. Because it is the active substance that is the main factor determining the pharmacological effect, effectiveness and safety level of the drug. In this regard, the analysis of medicinal products by INN is of great importance not only from the perspective of pharmaceutical marketing but also in ensuring rational pharmacotherapy.

Between 2013 and 2025, the share of active ingredients in the composition of second-generation antihistamines in the pharmaceutical market of Uzbekistan changed dynamically. According to the analysis results, active substances such as cetirizine, desloratadine, and levosetirizine consistently held the largest share during this period. In particular, while cetirizine held one of

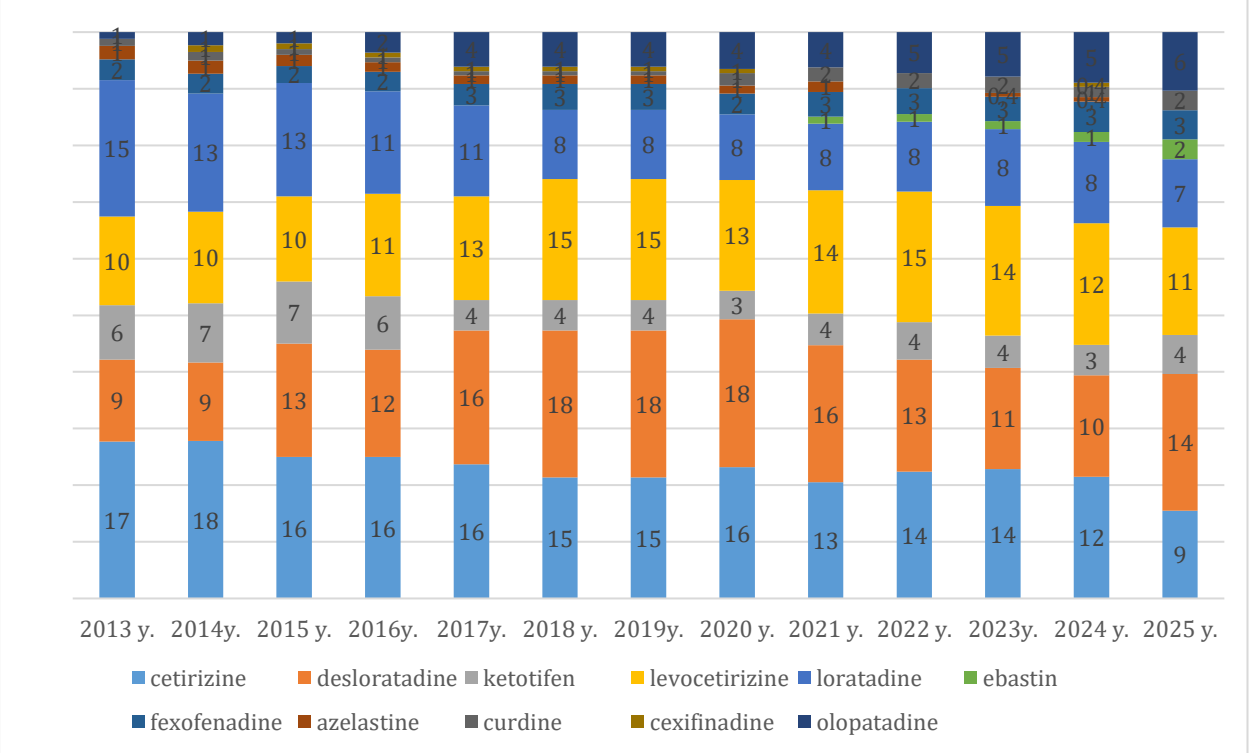
the leading positions in 2013 with a 17% share, its share gradually decreased in subsequent years, dropping to 9% by 2025. This situation is explained by market diversification and the introduction of a new generation of drugs.

Desloratadine, on the contrary, showed an upward trend. The share, which was 9% in 2013, reached its peak in 2018–2020, reaching 18%. Although a slight decline was observed later, it rose again to 14% in 2025, maintaining a significant position in the market.

Levosetirizine also maintained steadily high rates, ranging from a 10% share in 2013 to 14–15% in 2018–2022, with a subsequent decline to 11% in 2025. This might indicates its clinical efficacy and widespread use.

The share of loratadine has steadily decreased from 15% in 2013 to 7% by 2025. This means that more modern drugs with fewer side effects are prevailing.

While the share of ketotifen initially ranged from 6–7%, it has decreased to 3–4% in recent years, becoming one of the relatively rarely used drugs.



The remaining active substances—fexofenadine, ebastin, azelastin, bilastin, sechifenadine, and olopatadine—occupy a small share in the total composition. Each of them is mainly in the range of 1–5%, and some (such as olopatadine and bilastin) have shown a slight upward trend in recent years. This indicates an increasing demand for new and selective drugs (Fig. 2).

Figure 2. Analysis of active ingredients of second-generation antihistamines according to the State Register of Medicines and Medical Devices of the Republic of Uzbekistan, in percentage (2013–2025)

Based on the data from the State Register of Medicines and Medical Devices of the Republic of Uzbekistan, the composition of active substances of

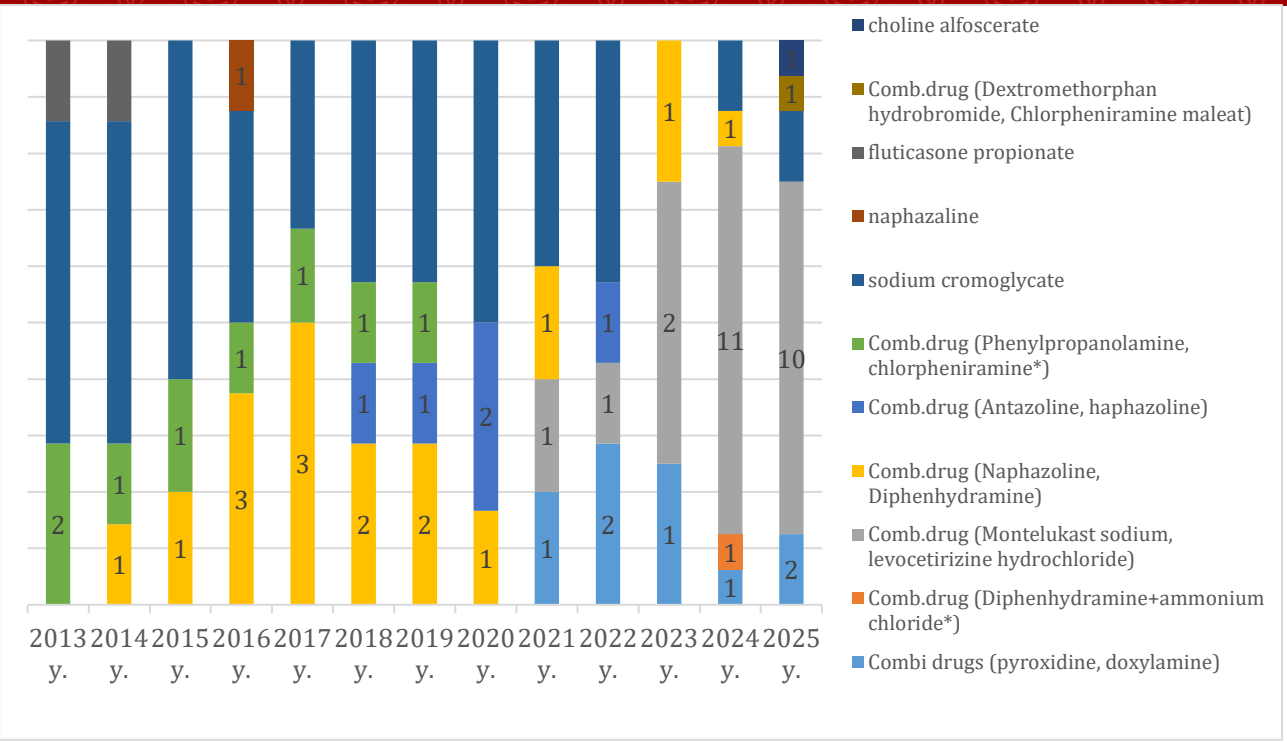
combined antihistamines registered between 2013 and 2025 was analyzed. This analysis allows for the determination of the developmental dynamics of combinations used in the treatment of allergic diseases in the pharmaceutical market.

According to the results of the analysis, in the early years, that is, in 2013-2015, the market was dominated by combinations of simple composition. During this period, first-generation drugs (e.g., chlorpheniramine and diphenhydramine) were primarily used as antihistamine components, which were often combined with decongestant agents. In particular, combinations with phenylpropanolamine and nafazoline are widespread, aimed at reducing allergic rhinitis symptoms, including nasal congestion and rhinorrhoea.

Between 2016 and 2019, diversification was observed in the composition of combined preparations. During this period, alongside antihistamine + decongestant combinations, new combinations began to appear, such as antazoline + nafazoline, as well as drugs containing other symptomatic components. At the same time, it is observed that substances with an anti-allergic prophylactic effect, such as sodium chromoglycate, have begun to be used.

In 2020–2022, combined antihistamines became more complex, and the share of multicomponent drugs increased. During this period, substances with bronchial and anti-inflammatory effects began to be included in the composition of drugs. In particular, the combination of montelucast sodium and levosetirizine hydrochloride has become widely used, allowing for complex treatment in cases of bronchial asthma or allergic-component cough combined with allergic rhinitis. Furthermore, the combination of dextromethorphan and chlorpheniramine is characterized by its use in allergic conditions accompanied by coughing.

During 2023–2025, significant changes will be observed in the composition of combined antihistamines. During this period, modern and highly effective combinations, particularly those based on montelucast + levosetirizine, occupy a leading position. At the same time, the number of multi-component drugs has increased, aimed at simultaneously affecting various pathogenetic stages of the allergic reaction. Additionally, combinations with steroid components such as fluticasone propionate have emerged, which are used in severe and chronic allergic conditions.



Overall, the results of the analysis show that combined antihistamines in the pharmaceutical market of Uzbekistan are improving year by year. While initially combinations with simple and symptomatic effects predominated, the share of complex, multi-component, and pathogenetically substantiated drugs is currently increasing. This indicates the formation of a modern, comprehensive approach to the treatment of allergic diseases (Fig. 3).

Figure 3. Analysis of active substances of combined antihistamine drugs according to the State Register of Medicines and Medical Devices of the Republic of Uzbekistan (2014–2025)

Between 2013 and 2025, the composition of antihistamines and the proportion of active substances in them have changed significantly. According to the analysis results, the largest share in the market was held by several main active substances.

First and foremost, clemastin drugs consistently showed high indicators, rising from 23 drugs in 2013 to 34 in 2022, followed by a slight decline to 18 in 2025. This indicates that it has been in steady demand for many years.

Dimenhydrinate preparations (or a group close to them) also showed significant growth dynamics: from 12 in 2013 to 39 in 2021, which is the maximum figure. Although a slight decrease has been observed in recent years, a high level of 28 drugs remains in 2025.

Preparations containing the active substance promethazine also account for a significant share. Their number increased from 13 in 2013 to 35 in 2021-2022, and then gradually decreased to 21 in 2025.

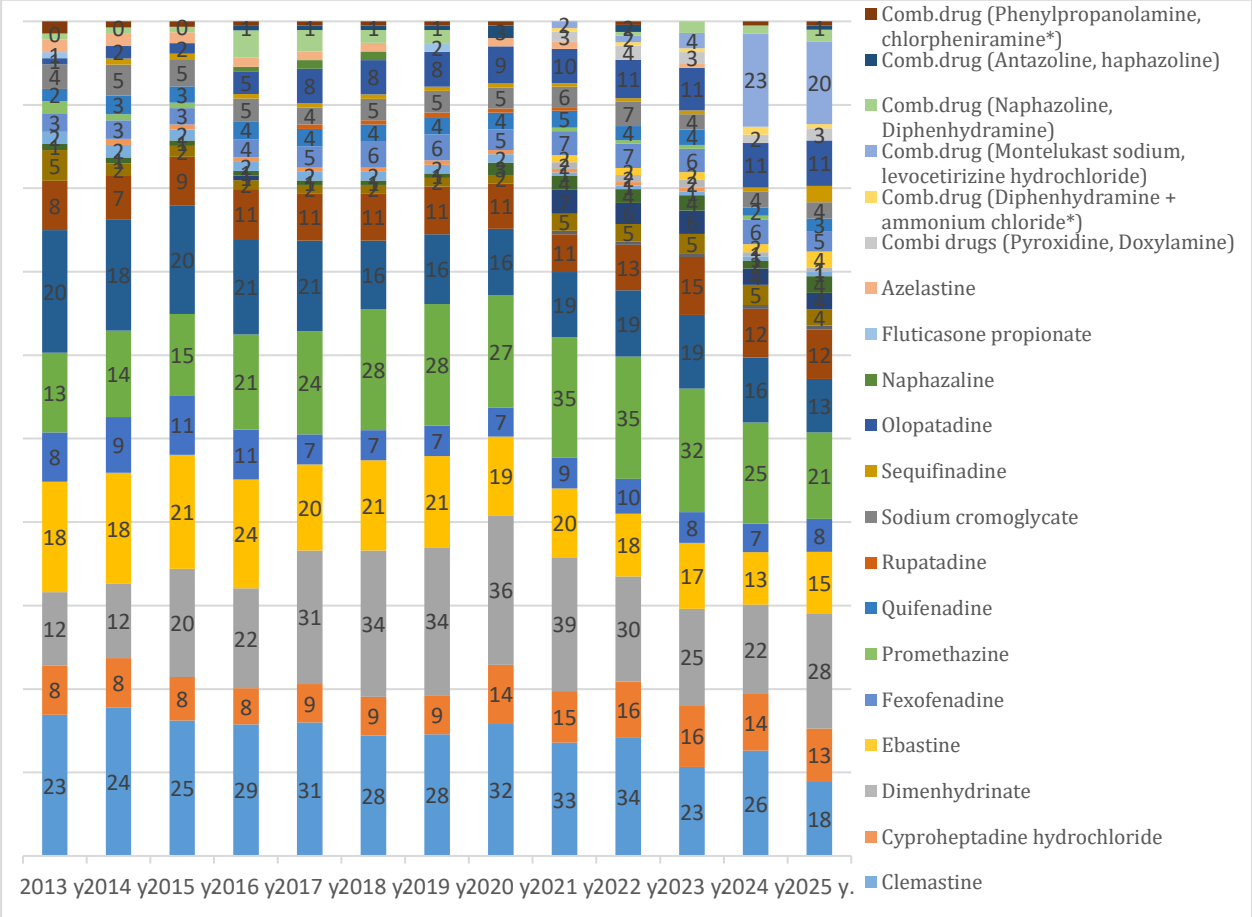
An upward trend is also observed for substances such as loratadine, cetirizine (levosetirizine), fexofenadine, and ebastin, which are second-generation antihistamines. For example, the number of fexofenadine drugs

increased from 8 in 2013 to 11 in 2023, indicating a growing demand for modern drugs with fewer side effects.

A new generation of antihistamines, such as rupatadin, desloratadin, and olopatadin, has also gradually entered the market, and their share is increasing every year, especially after 2018. Additionally, combined drugs (e.g., montelucast + levosetirizine, diphenhydramine-based combinations) also play an important role. In particular, between 2023 and 2025, the number of such combinations increased sharply, reaching more than 20 drugs in some cases. Overall, the analysis shows that:

• Old generation (1st generation) antihistamines still have a significant share in the market, but their growth is limited;

• The share of new (2nd and 3rd generation) antihistamines is increasing year by year;



• The combined drug segment has been the fastest-growing area in recent years (Fig. 4).

Figure 4. Quantitative analysis of antihistamines by INN in accordance with the State Register of Medicines and Medical Devices of the Republic of Uzbekistan (2013–2025)

Conclusions:

1. The results of the analysis show that significant structural changes are occurring in the market of first-generation antihistamines. In particular, while the share of first-generation drugs with a high sedative effect is decreasing, relatively safe and effective drugs maintain their position. At the same time, the increasing share of new and less

commonly used active substances confirms the diversification and modernization of the pharmaceutical market.

2. The analysis shows that in the segment of second-generation antihistamines in the pharmaceutical market of Uzbekistan, the share of classical drugs (cetirizine, loratadine) is gradually decreasing, while the share of modern and safer drugs such as desloratadine, levosetirizine, and new molecules is increasing. This is due to the development of the pharmaceutical market, the clinical choice of doctors and pharmacists, and the changing needs of patients.

3. Between 2013 and 2025, the composition of combined antihistamines improved significantly. Initially, simple combinations with predominantly symptomatic effects predominated, but in recent years, they have been replaced by modern multicomponent, complex, and pathogenetically substantiated drugs. In particular, the widespread use of combinations based on montelucast and levosetirizine indicates the formation of a more effective and systemic approach to the treatment of allergic diseases.

4. Between 2013 and 2025, the composition of active substances in the antihistamine drug market has significantly updated. Although first-generation drugs (clemastin, dimenhydrinate, promethazine) held a leading position for a long time, their share has decreased in recent years, and the demand for modern (2nd and 3rd-generation) antihistamines has increased. In particular, the rapid development of the combined drug segment indicates an increased need for the comprehensive treatment of allergic diseases.

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