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THE IMPORTANCE AND SIGNIFICANCE OF DEVELOPING ANTHELMINTIC SUPPOSITORIES FOR CHILDREN IN UZBEKISTAN

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Abstract: Helminthiases are among the most widespread parasitic diseases affecting children worldwide and represent a significant public health concern, particularly in developing countries. According to the World Health Organization, hundreds of millions of school-aged children are infected with intestinal helminths globally [1]. In Uzbekistan, ascariasis, enterobiasis, and other helminth infections remain prevalent and continue to negatively affect children's health. Most currently available anthelmintic medicines are administered orally, which poses challenges in pediatric practice due to poor compliance and gastrointestinal adverse effects. This article substantiates the scientific, clinical, and social importance of developing pediatric anthelmintic suppositories (rectal dosage forms) in Uzbekistan.

Keywords: helminthiasis, children, anthelmintic drugs, suppositories, rectal dosage forms, pediatrics.

Introduction Helminthiases are parasitic diseases caused by various intestinal worms, predominantly affecting populations living in areas with inadequate sanitation and hygiene [2]. The most common causative agents include Ascaris lumbricoides, Enterobius vermicularis, and hookworms [3]. These parasites colonize the gastrointestinal tract, interfere with nutrient absorption, and exert toxic effects on the host organism. Children are particularly vulnerable to helminth infections due to age-related behavioral and hygienic factors. In Uzbekistan, helminthiases among children remain a pressing public health issue, imposing a considerable burden on the healthcare system [12].

Impact of helminthiases on children's health

Scientific evidence indicates that helminth infections in children are associated with multiple adverse outcomes, including:

- anemia and micronutrient deficiencies;
- impaired physical growth and development;
- gastrointestinal dysfunction;
- allergic reactions;
- weakened immune responses [3,5].

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Chronic helminthiases have also been linked to reduced cognitive performance, behavioral disturbances, and poor academic achievement among school-aged children [4].

Limitations of current anthelmintic treatment approaches

At present, helminth infections are primarily treated using anthelmintic drugs such as albendazole and mebendazole [6]. These medications are predominantly formulated as tablets or oral suspensions.

However, pediatric use of oral anthelmintics is associated with several limitations:

• difficulty swallowing tablets;

• refusal to take medication due to unpleasant taste;

• gastrointestinal adverse effects, including nausea and abdominal pain;

• hepatic first-pass metabolism resulting in increased systemic toxicity [7].

These limitations underscore the need to develop alternative dosage forms better suited for pediatric patients.

Scientific and practical significance of developing anthelmintic suppositories

Advantages of rectal dosage forms

Rectal suppositories represent an effective alternative route of drug administration. Their main advantages include:

• avoidance of oral administration;

• reduced irritation of the gastrointestinal tract;

• partial bypass of hepatic first-pass metabolism;

• suitability for use in children experiencing vomiting or swallowing difficulties [9,10]. These characteristics make rectal suppositories particularly advantageous for pediatric anthelmintic therapy.

Relevance in the context of Uzbekistan

Currently, there are virtually no pediatric-specific anthelmintic suppositories produced domestically in Uzbekistan. Developing such formulations within the local pharmaceutical industry would:

• reduce dependence on imported medicines;

• lower treatment costs;

• improve accessibility to child-friendly and safe dosage forms;

• enhance overall treatment effectiveness in pediatric practice [8,12].

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Pharmaceutical and technological considerations

The development of anthelmintic suppositories requires careful consideration of several key factors:

- pharmacokinetic properties of the active pharmaceutical ingredient;
- selection of excipients that enhance rectal absorption;
- safe and age-appropriate dosing;
- physicochemical stability and melting characteristics of the suppository base [9].

Addressing these parameters is essential to ensure both efficacy and safety of the final medicinal product.

Discussion. The development of pediatric anthelmintic suppositories represents an innovative approach to the management of helminth infections in children. This dosage form improves treatment adherence, minimizes adverse effects, and offers practical advantages in pediatric care. In Uzbekistan, advancing this direction requires coordinated scientific research, pharmaceutical development, clinical trials, and regulatory support.

Conclusion. The development of anthelmintic suppositories for children in Uzbekistan is of significant scientific, clinical, and social importance. This pharmaceutical innovation has the potential to improve children's health outcomes, reduce the prevalence of helminthiases, and contribute to the advancement of the national pharmaceutical industry. Future efforts should focus on comprehensive research, clinical evaluation, and integration into pediatric healthcare practice.

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