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EPIDEMIOLOGICAL CHARACTERISTICS OF THE SPREAD OF HYMENOLEPIDOSIS INVASION IN THE REPUBLIC OF KARAKALPAKSTAN

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Abstract

This article presents a retrospective analysis of the prevalence and epidemiological characteristics of hymenolepiasis in the Republic of Karakalpakstan during the period from 2014 to 2024. The study is based on data from 20,063 cases officially registered by the sanitary and epidemiological service institutions of the Republic of Karakalpakstan. Incidence rates were calculated per 100,000 population, and long-term trends as well as territorial distribution of the disease were analyzed.

The results demonstrated that the incidence of hymenolepiasis was uneven over the years, with sharp increases observed in certain periods. The highest incidence rates were recorded in hyperendemic areas.

Keywords: helminthiases, hymenolepiasis, epidemiological analysis, Republic of Karakalpakstan, childhood morbidity.

Helminthic diseases currently remain one of the pressing public health issues worldwide. These diseases exert long-term adverse effects on the human body, leading to weakened immunity, allergic reactions, disruption of the digestive system, and delayed physical and mental development in children. Among helminthic infections, intestinal cestodiases, particularly hymenolepiasis, hold special significance.

Hymenolepiasis is caused by the parasite *Hymenolepis nana* and is most commonly observed in children. A key epidemiological feature of this disease is that humans serve as the primary source of infection. Due to the possibilities of autoinfection and reinfection, the disease can persist for extended periods and spread rapidly. High prevalence rates are often recorded in regions where sanitary-hygienic practices are insufficiently observed, drinking water quality is poor, and the population's sanitary culture is low.

In Central Asian countries, including the Republic of Uzbekistan, hymenolepiasis remains an epidemiologically significant infection. The distribution of the disease across the country is closely associated with climatic, socio-economic, and environmental factors, with infection rates particularly high among children. Consequently, in recent years, several national and international programs have been implemented aimed at the prevention of helminthic infections.

The Republic of Karakalpakstan, as a region with unique ecological and social conditions in Uzbekistan, presents particular scientific and practical interest for studying the patterns of hymenolepiasis. Local climatic conditions, drinking water issues, population density, and sanitation factors can directly influence the epidemiology of the disease. Therefore, analyzing

the epidemiological situation of hymenolepiasis in this region, as well as identifying trends and patterns of infection, is of significant importance.

Objective of the Study. The aim of this study was to conduct a retrospective analysis of the prevalence and epidemiological characteristics of hymenolepiasis in the Republic of Karakalpakstan over the period 2014–2024, to identify trends in infection, and to develop evidence-based recommendations for improving preventive measures against the disease.

The study was based on a retrospective epidemiological analysis of hymenolepiasis cases registered in the Republic of Karakalpakstan during 2014–2024. Official reports from the sanitary-epidemiological service institutions of the region were used as the primary data source.

During the 11-year study period, information on a total of 20,063 patients diagnosed with hymenolepiasis was analyzed. Morbidity rates were calculated relative to the population size, with incidence expressed per 100,000 inhabitants.

The epidemiological analysis employed methods including retrospective review, time series analysis, calculation of incidence rates, and assessment of annual trends in disease prevalence. The results were presented in graphical and chart formats. Statistical processing of the data was conducted using standard epidemiological methods. The findings of the study aimed to elucidate the spatial and temporal distribution patterns of hymenolepiasis in the region.

Results. During the period 2014–2024, a total of 20,063 cases of hymenolepiasis were registered in the Republic of Karakalpakstan. The incidence rates per 100,000 population ranged from 55.3 to 122.1. In 2014, the incidence rate was 80.9, while in 2017 the highest rate of 122.1 was recorded, with 2,219 cases registered (Figure 1).

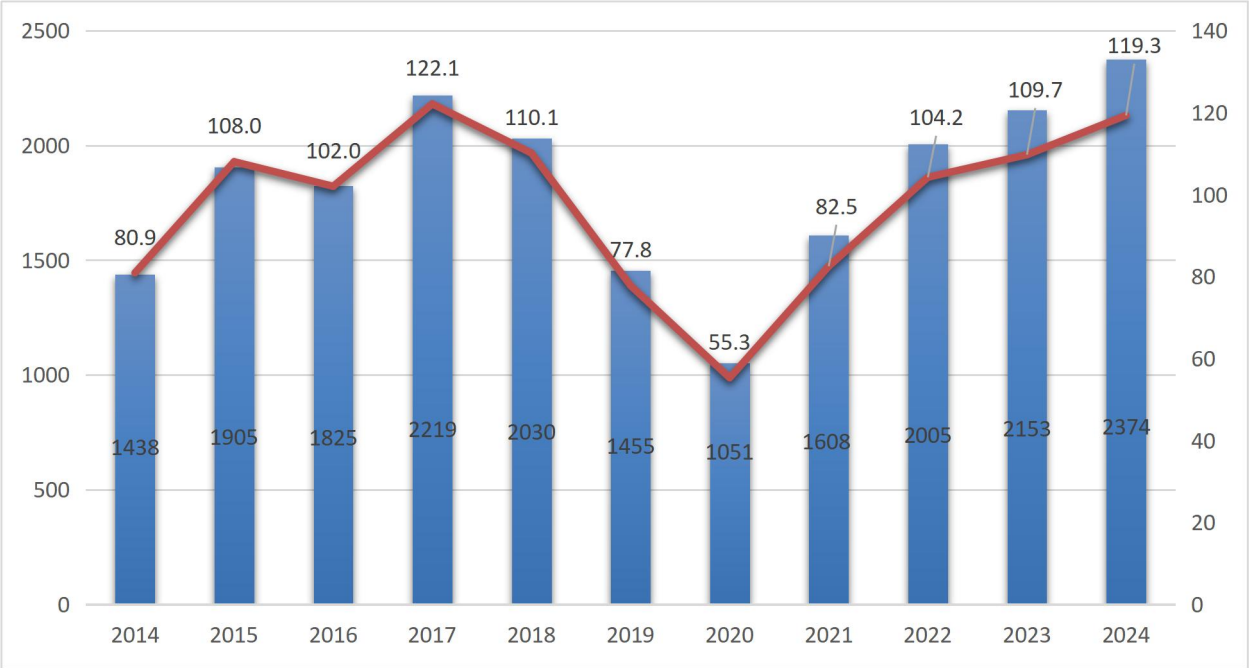


Figure 1. Total number of registered hymenolepiasis cases and incidence rates per 100,000 population in the Republic of Karakalpakstan, 2014–2024.

During 2018–2020, a decline in hymenolepiasis cases was observed. In 2020, 1,051 cases were registered, corresponding to an incidence rate of 55.3 per 100,000 population. This

decrease was primarily attributed to the COVID-19 pandemic, strict quarantine measures, reduced social contact, and increased adherence to sanitary and hygiene practices.

After 2021, the incidence of the disease began to rise again, reaching 2,374 cases in 2024, with an incidence rate of 119.3 per 100,000 population. Analysis of the distribution across the 17 districts and cities of Karakalpakstan revealed uneven prevalence. The regions were classified into hyperendemic, mesoendemic, and hypoendemic categories (Figure 2).

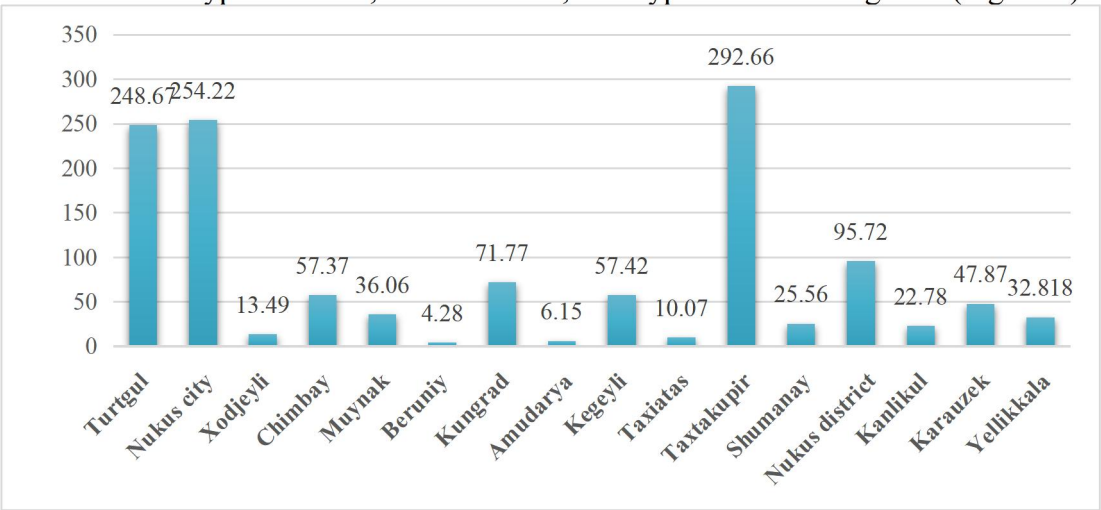


Figure 2. Average incidence rates of hymenolepiasis per 100,000 population in the cities and districts of the Republic of Karakalpakstan, 2014–2024.

The hyperendemic regions included Takhtakupyr and Turtkul districts, as well as the city of Nukus, where incidence rates per 100,000 population ranged from 233.8 to 281.5 during 2014–2024. In the mesoendemic regions (Nukus, Kungrad, Chimbay, Kegeyli, and Karaozak), a total of 2,990 cases were registered, accounting for 16.11% of all cases. In the hypoendemic regions (Muynak, Kunlikul, Elikkala, Shumanay, Khodjayli, and others), the incidence was lower, with a total of 1,533 cases, representing 6.43% of all infections.

Conclusion. The results of the study revealed that the distribution of hymenolepiasis in the Republic of Karakalpakstan is uneven, with periodic peaks observed in hyperendemic regions. The prevalence of the disease was found to be associated with population density and migration, as well as the functioning of healthcare services and laboratories. Additionally, the infection occurs across all age groups, with cases reported in children as young as 10 months and extending to adults. These findings highlight the importance of implementing geographically targeted preventive measures.

The data also indicate that, similar to other helminthic infections, hymenolepiasis is most prevalent among children. Specifically, 80% of cases occurred in children under 14 years of age, while 20% were observed in older individuals. This underscores the need to refine preventive strategies both regionally and across different age groups based on the distribution patterns revealed by the study.

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