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SEASONAL AND LONG-TERM TRENDS IN THE INCIDENCE OF ROTAVIRUS INFECTION AMONG CHILDREN IN TASHKENT: A RETROSPECTIVE ANALYSIS FOR 2014–2024



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Abstract. Rotavirus infection remains one of the leading causes of acute diarrheal diseases in young children despite the implementation of mass immunization. The aim of this study was to assess long-term trends and seasonal characteristics of rotavirus infection among children aged 0–14 years in Tashkent from 2014 to 2024. A retrospective analysis of annual and monthly incidence rates was performed, with calculation of incidence per 100,000 children. A wave-like pattern of the epidemic process was identified, with a peak in 2016, a marked decline in 2020–2021 during the COVID-19 pandemic, and a subsequent increase in 2022–2023. Prior to 2020, a distinct winter–



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spring seasonality was observed; however, in the post-pandemic period this pattern shifted, with atypical summer–autumn increases. These findings suggest a transformation in the epidemiological patterns of rotavirus circulation following the pandemic and underscore the need to strengthen epidemiological and molecular genetic surveillance to evaluate changes in strain distribution and herd immunity among the pediatric population.

Keywords: rotavirus, children, incidence, seasonality, epidemiology, vaccination, Tashkent.

TOSHKENT SHAHRIDA BOLALAR O'RTASIDA ROTAVIRUS INFEKSIYASI KASALLANISHINING MAVSUMIY VA UZOQ MUDDATLI TENDENSIYALARI: 2014– 2024 YILLAR BO'YICHA RETROSPEKTIV TAHLIL

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Annotatsiya. Rotavirus infeksiyasi ommaviy immunizatsiya joriy etilganiga qaramay, erta yoshdagi bolalarda o'tkir diareya kasalliklarining yetakchi sabablaridan biri bo'lib qolmoqda. Mazkur tadqiqotning maqsadi 2014–2024 yillarda Toshkent shahrida 0–14 yoshli bolalar orasida rotavirus infeksiyasining ko'p yillik dinamikasi va mavsumiy xususiyatlarini baholashdan iborat bo'ldi. Bolalar aholisi orasida har 100 ming nafarga nisbatan intensiv ko'rsatkichlar hisoblangan holda yillik va oylik kasallanish darajalarining retrospektiv tahlili o'tkazildi. Epidemik jarayonning to'liqinsimon xarakteri aniqlandi: 2016 yilda eng yuqori ko'rsatkich, 2020–2021 yillarda COVID-19 pandemiyasi davrida sezilarli pasayish hamda 2022–2023 yillarda qayta o'sish kuzatildi. 2020 yilgacha aniq qish–bahor mavsumiyligi qayd etilgan bo'lsa, postpandemiya davrida ushbu qonuniyat buzilib, yoz–kuz oylarida atipik ko'tarilishlar kuzatildi. Olingan natijalar pandemiyadan so'ng rotavirus aylanishining epidemiologik qonuniyatlari o'zgarganini ko'rsatadi hamda bolalar populyatsiyasida shtamm tarkibi va jamoaviy immunitetdagi o'zgarishlarni baholash maqsadida epidemiologik va molekulyar-genetik nazoratni kuchaytirish zarurligini ta'kidlaydi.

Kalit so'zlar: rotavirus, bolalar, kasallanish darajasi, mavsumiylilik, epidemiologiya, emlash, Toshkent.

СЕЗОННЫЕ И ДОЛГОСРОЧНЫЕ ТЕНДЕНЦИИ ЗАБОЛЕВАЕМОСТИ РОТАВИРУСНОЙ ИНФЕКЦИИ СРЕДИ ДЕТЕЙ В ГОРОДЕ ТАШКЕНТ: РЕТРОСПЕКТИВНЫЙ АНАЛИЗ ЗА 2014–2024 ГОДЫ

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Аннотация. Ротавирусная инфекция остаётся одной из ведущих причин острых диарейных заболеваний у детей раннего возраста, несмотря на внедрение массовой иммунизации. Целью исследования явилось определение многолетних тенденций и сезонных особенностей заболеваемости ротавирусной инфекцией среди детей 0–14 лет в г. Ташкенте за 2014–2024 гг. Проведен ретроспективный анализ годовой и помесечной динамики заболеваемости с расчётом интенсивных показателей на 100 тыс. детского населения. Установлен волнообразный характер эпидемического процесса с пиком в 2016 г., выраженным снижением в 2020–2021 гг. в период пандемии COVID-19 и последующим подъёмом в 2022–2023 гг. До 2020 г. отмечалась чёткая зимне-весенняя сезонность, которая в постпандемический период нарушилась с появлением атипичных летне-осенних подъёмов. Полученные данные свидетельствуют о трансформации эпидемиологических закономерностей циркуляции ротавируса после пандемии и подчёркивают необходимость усиления эпидемиологического и молекулярно-генетического надзора для оценки изменений штаммового состава и коллективного иммунитета детского населения.

Ключевые слова: ротавирус, дети, заболеваемость, сезонность, эпидемиология, сезонность, вакцинация, Ташкент.

Introduction: Before the introduction of mass vaccination against rotavirus infection, annual surges of acute diarrheal diseases and a significant number of deaths among children under five years old were observed [2, 3]. The implementation of vaccines has significantly reduced the incidence and mortality rates. However, rotavirus infection remains one of the leading causes of acute diarrheal diseases in young children [1, 4].

Objective of the study: To determine long-term trends and seasonal patterns of rotavirus infection among children aged 0–14 years in Tashkent over the period 2014–2024.

Literature Review and Methodology / Methods: A retrospective epidemiological analysis was conducted using annual and monthly data on rotavirus infection among children aged 0–14 years in Tashkent for the period 2014–2024. Monthly data for 2020–2021 were excluded from the analysis due to the low reported incidence during the COVID-19 pandemic. Incidence rates were calculated per 100,000 children in the corresponding age group. Statistical data processing was performed using MS Excel.

This retrospective analysis allowed the identification of annual fluctuations in incidence and seasonal patterns of rotavirus infection before, during, and after the COVID-19 pandemic.

Results: Analysis of incidence rates revealed a wave-like pattern of rotavirus infection in Tashkent from 2014 to 2024 (Figure 1): in 2014 incidence was 9.5 per 100,000 children; in 2015 a sharp increase to 51.3 per 100,000 was observed; the maximum level was recorded in 2016 — 90.8 per 100,000; from 2017 to 2019 incidence declined (36.0–43.8 per 100,000); in 2020–2021 incidence sharply decreased to 2.3 and 2.7 per 100,000, likely due to COVID-19 control measures; in 2022–2023 a new rise in incidence was observed (55.2 and 79.3 per 100,000), followed by a decrease to 35.8 per 100,000 in 2024. Seasonal analysis (Figure 2) showed that before 2020 there



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was clear winter–spring seasonality with a peak in December (2016 — 22.6 per 100,000) and a minimum in summer; in 2020–2021 incidence was almost absent in most months; from 2022 epidemiological activity resumed with atypical peaks during the warm season (April 2022 — 9.0; October–December 2022 — 12.9–15.5 per 100,000); in 2023 seasonality shifted and flattened with high incidence during summer (June–August — ~8.0 per 100,000); in 2024 incidence stabilized at a relatively low level without clear peaks.

Discussion: The results confirm that rotavirus infection in Tashkent exhibited stable seasonal dynamics before 2020, characteristic of high-income regions. COVID-19 pandemic measures led to a sharp decrease in incidence, disruption of seasonal peaks, and changes in virus circulation.

Comparison with international data shows similar trends: China and Brazil reported reduced incidence and changes in circulating genotypes [2-4]. Models predict that as social contacts are restored, rotavirus outbreaks may exceed pre-pandemic levels.

In Tashkent, partial recovery of seasonal activity with atypical summer–autumn peaks may reflect:

1. Relaxation of COVID-19 restrictions.
2. Changes in viral serotype circulation.
3. Possible reduction of herd immunity among children.

These findings highlight the need for strengthened epidemiological surveillance and molecular-genetic monitoring of circulating rotavirus strains to predict and control outbreaks.

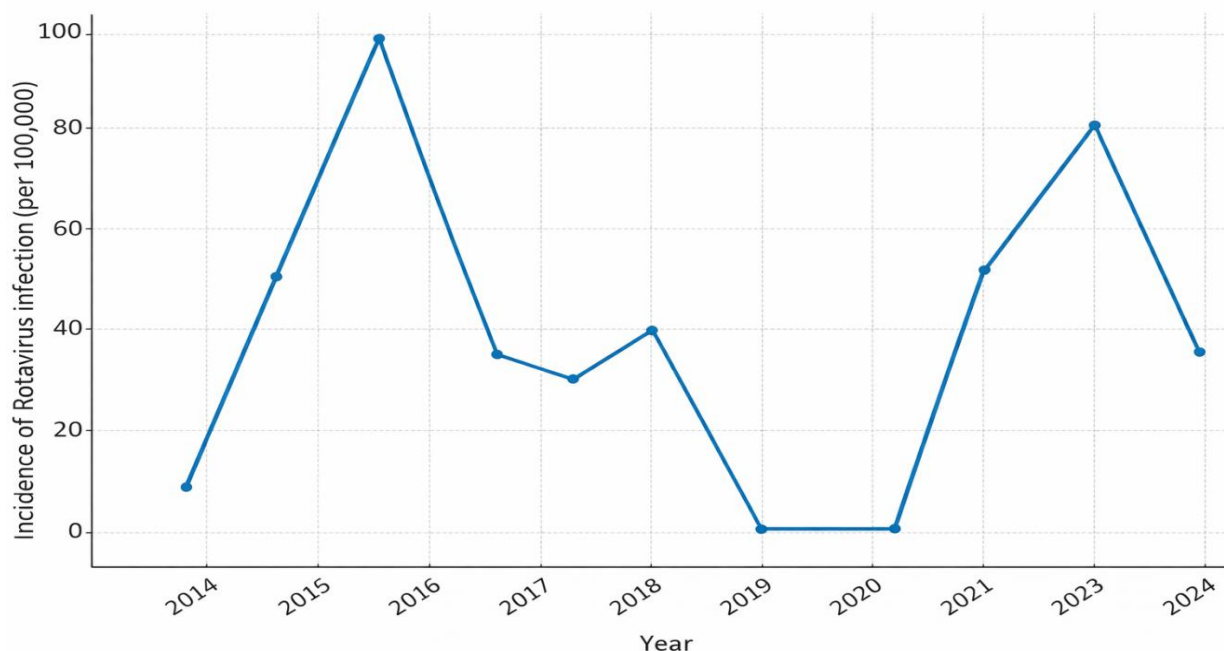


Figure 1. Annual dynamics of rotavirus infection incidence.



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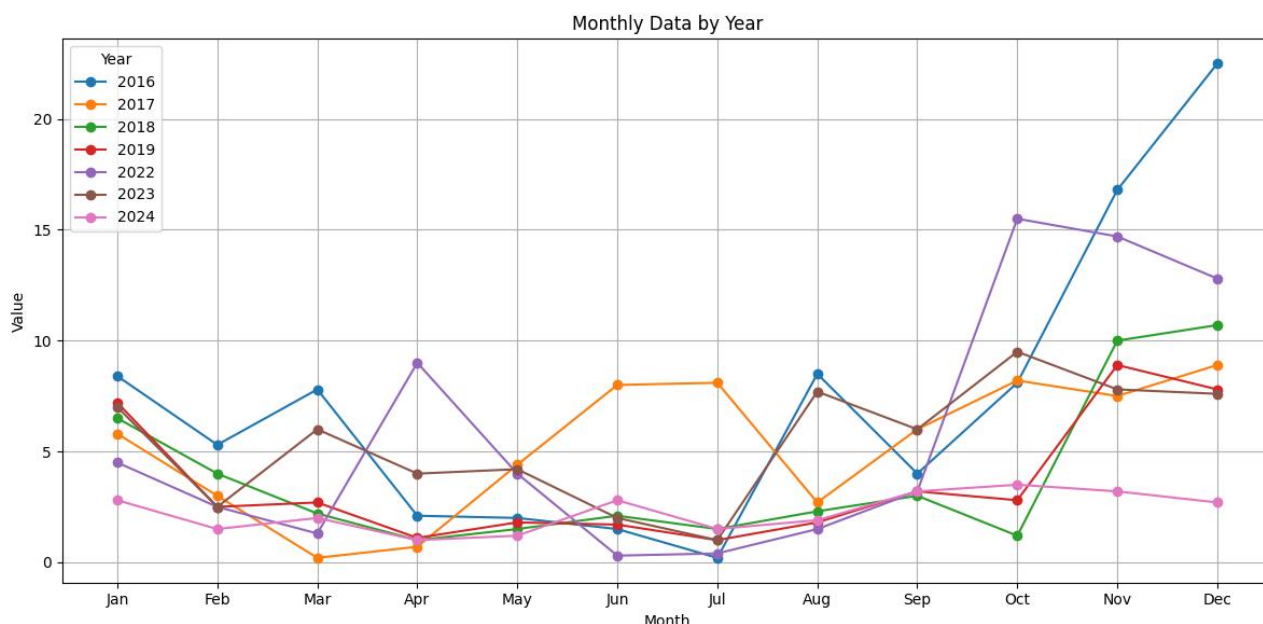


Figure 2. Monthly dynamics of rotavirus infection incidence»

Conclusion: The retrospective analysis of rotavirus infection among children aged 0–14 in Tashkent (2014–2024) revealed:

1. A wave-like annual dynamic with a sharp decline in 2020–2021 during the COVID-19 pandemic.
2. Clear winter–spring seasonality before 2020; post-pandemic years showed disruption with atypical summer–autumn peaks.
3. Strengthened epidemiological surveillance and molecular-genetic monitoring of circulating strains, including analysis of antigenic drift and genotype variability, are needed to better understand and manage rotavirus epidemiology.

References:

1. Туйчиев Л. Н., Рахимов Р. Р., Мухамедова Н. М., Юлчиева Р.Б., Рузметова С. И., Миркасымова Х. Х., Низамхожаева М.А. Клиническая характеристика острых диарей инфекционного генеза у детей различного возраста // Забайкальский медицинский журнал. – Чита: Читинская государственная медицинская академия, 2025. – № 2. – С. 79-84
2. Inchauste L, Patzi M, Halvorsen K, Solano S, Montesano R, Iñiguez V. Impact of rotavirus vaccination on child mortality, morbidity, and rotavirus-related hospitalizations in Bolivia. *Int J Infect Dis.* 2017 Aug;61:79-88. doi: 10.1016/j.ijid.2017.06.006. Epub 2017 Jun 13. PMID: 28627429.
3. Burnett E, Parashar UD, Tate JE. Global Impact of Rotavirus Vaccination on Diarrhea Hospitalizations and Deaths Among Children <5 Years Old: 2006-2019. *J Infect Dis.* 2020 Oct 13;222(10):1731-1739. doi: 10.1093/infdis/jiaa081. PMID: 32095831; PMCID: PMC748397



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4. Yan Y, Zeng Z, Gao H, Zeng S, Duan S, Jiang J, Ai X, Zeng L, Yao S, Long Y. Comparative analysis of the epidemiological characteristics of adenovirus, rotavirus A, and coinfection in children during 2014-2023 in Guangzhou, China. *Virol J.* 2024 Nov 14;21(1):292. doi: 10.1186/s12985-024-02537-1. PMID: 39543719; PMCID: PMC11566288.

