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Analysis of the prevalence of chronic otolaryngological pathology in children in the Novosibirsk region

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ABSTRACT

BACKGROUND: Currently, there is an increase in the number of chronic forms of otolaryngological diseases among children. Many authors emphasize the high need and low availability of specialized medical care and socioeconomic difficulties, which contribute to the earlier, more frequent, and more severe manifestation of otolaryngological diseases in children.

AIM: The study aimed to analyze the prevalence of chronic otolaryngological diseases among the pediatric population in the Novosibirsk Region.

MATERIALS AND METHODS: A team of researchers from the Novosibirsk State Medical University together with the Novosibirsk City Children's Clinical Emergency Hospital assessed the specialized otolaryngological care provided to the pediatric population from 2018 to 2023. The statistical data from the Federal State Statistics Service of the Novosibirsk Region were analyzed using a time series analysis, which includes trend lines, a regression analysis, and forecasting. The approximation coefficient indicates a high degree of accuracy in the study.

The statistical material was processed using the Statistica 6.0 (StatSoft, 2001) and Excel 2011 software packages.

RESULTS: A statistical data analysis from 2012 to 2022 revealed a 74% and 23% increase in the incidence of chronic otitis media and diseases of the tonsils and adenoids, respectively, among children aged 0–17 years in the region.

CONCLUSIONS: The study showed an annual increase in chronic otolaryngological pathology among the pediatric population. In the Novosibirsk Region, the number of cases of recurrent and chronic respiratory pathology among children under 14 years of age increased by 10.1%, with a particularly significant increase among 15–17-year-olds, reaching 19.2%.

Conversely, the incidence of recurrent and long-term ear and mastoid pathology stabilized and decreased by 19.5% in children aged 0–14 years and by 11.7% in adolescents.

For the analyzed period, a significant increase in chronic otolaryngological pathology in the region was found, indicating delayed treatment and low accessibility of specialized medical care for children.

The high number of surgeries on the ear, nose, and throat in children indicates a decompensated course of chronic diseases requiring inpatient care and surgical intervention. The availability of specialized care at the disease onset should be ensured to reduce surgical treatment in pediatric otolaryngology.

Keywords: pediatric population; otolaryngology; otolaryngologist; availability; chronic diseases.

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ОРИГИНАЛЬНОЕ ИССЛЕДОВАНИЕ

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Анализ распространённости хронической оториноларингологической патологии у детей по Новосибирской области

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АННОТАЦИЯ

Обоснование. В настоящее время наблюдается рост числа хронических форм заболеваний среди детей в области оториноларингологии, при этом многие авторы подчёркивают высокую потребность и низкую доступность специализированной оториноларингологической помощи и социально-экономические трудности, что способствует более раннему, частому и тяжёлому проявлению ЛОР-заболеваний у детей.

Цель. Провести анализ особенностей распространённости хронических заболеваний по профилю «оториноларингология» среди детского населения по Новосибирской области.

Материалы и методы. Группа учёных Новосибирского государственного медицинского университета совместно с Городской детской клинической больницей скорой медицинской помощи г. Новосибирска провели анализ работы по оказанию специализированной медицинской помощи среди детского населения по профилю «оториноларингология» с 2018 по 2023 год. Осуществлён анализ статистических данных Росстата по Новосибирской области. Статистический анализ полученных данных выполнен с помощью анализа временных рядов с использованием линии тренда, регрессионного анализа и прогнозирования. Коэффициент аппроксимации соответствует высокой точности исследования.

Для обработки статистического материала использовали пакет прикладных статистических программ Statistica 6.0 (StatSoft, 2001) и стандартный пакет программ Excel 2011.

Результаты. Анализ статистических материалов с 2012 по 2022 год в регионе выявил увеличение заболеваемости хроническим средним отитом на 74% среди детей в возрасте от 0 до 17 лет. Анализ статистических данных показал, что за изучаемый период уровень заболеваемости хроническими болезнями миндалин и аденоидов среди детей в возрасте 0–17 лет увеличился на 23%.

Заключение. Исследование установило, что среди детского населения ежегодно увеличивается число случаев с хронической патологией по направлению «оториноларингология». В Новосибирской области количество наблюдений с рецидивирующей и хронической патологией органов дыхания среди детей до 14 лет увеличилось на 10,1%, особенно среди 15–17-летних — 19,2%.

На региональном уровне зафиксированы стабилизация и снижение показателей с рецидивирующей и длительно протекающей патологией уха и сосцевидного отростка, среди детей 0–14 лет — на 19,5%, среди подростков снижение составило 11,7%.

За анализируемый период установлено значительное увеличение распространённости хронической ЛОР-патологии в регионе, что указывает на несвоевременное обращение и низкую доступность ЛОР-помощи для детей.

Большое количество оперативных вмешательств на ЛОР-органах среди детей указывает на декомпенсированное течение хронических заболеваний, что требует стационарной помощи и оперативного вмешательства. Для снижения хирургического лечения в детской оториноларингологии необходимо обеспечить доступность ЛОР-помощи при возникновении заболеваний.

Ключевые слова: детское население; оториноларингология; врач-оториноларинголог; доступность; хронические заболевания.

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BACKGROUND

The ongoing development of the healthcare system in the Russian Federation necessitates a scientific basis for enhancing specialized medical care. The analysis of existing studies indicates that the high demand for otorhinolaryngological services, combined with socioeconomic challenges, contributes to the earlier onset, increased incidence, and greater severity of ENT diseases in children. One of the key goals of modern healthcare is to implement measures aimed at improving specialized care for patients with ENT conditions at both the outpatient and inpatient levels [1–3].

Pediatric morbidity rates serve as indicators of the socioeconomic conditions of a given region and the country as a whole. Studies by Baranov, Daikhes, and Fomina have examined children's health status and the performance of ENT services in Russia. However, the prevalence of chronic ENT diseases in the pediatric population remains insufficiently explored. Studying and monitoring of pediatric morbidity provides a foundation for long-term strategic planning and supports the formulation of key objectives and priorities in social policy at various levels [4–6].

To ensure effective implementation of preventive strategies for ENT diseases and to improve the quality of specialized care, healthcare providers and system organizers must have access to current data on the prevalence and characteristics of ENT conditions. Many authors have investigated the spreading of ENT disorders, with most studies focusing on visit-based morbidity data. This approach primarily reflects the prevalence of acute diseases of the ear, nose, and throat. However, it does not adequately capture the burden of chronic diseases and thus only indirectly represents the true morbidity structure [7–9].

Unfortunately, there are few studies devoted to the analysis of chronic ENT diseases among the pediatric population, which could provide clear scientific and practical results. Such studies were conducted long ago and limited to specific regions, which underscores the relevance of this work.

AIM

The study aimed to analyze the prevalence of chronic otolaryngological diseases among the pediatric population in the Novosibirsk Region.

METHODS

Faculty members of the Department of Public Health and Healthcare Institution, Faculty of Advanced Training and Medical Professional Retraining of Physicians at Novosibirsk State Medical University, in collaboration with the City Children's Clinical Emergency Hospital, conducted a study on ENT care in the Novosibirsk Region. A statistical analysis of otorhinolaryngologic morbidity among the pediatric population in the region was performed using the data from the Federal State Statistics Service (Rosstat) covering the period from 2012 to 2022. The data were evaluated using time-series analysis with trend lines, regression modeling, and forecasting. The approximation coefficient indicated high accuracy of the study.

The statistical data analyzed was performed using the Statistica 6.0 software package (StatSoft, 2001) and Microsoft Excel 2011.

RESULTS

The analysis of pediatric otorhinolaryngologic morbidity demonstrated that diseases of the ear and mastoid process, together with upper respiratory tract disorders, are frequently concomitant and require a multidisciplinary treatment approach.

The analysis of the statistical data from the Novosibirsk Region revealed a steady increase in the number of recurrent and chronic upper respiratory tract diseases among children aged 0 to 14 years over the past decade.

From 2012 to 2022, the overall morbidity of respiratory diseases among children aged 0 to 14 years increased by 10.1%. In 2020, a 14.7% decrease in reported respiratory

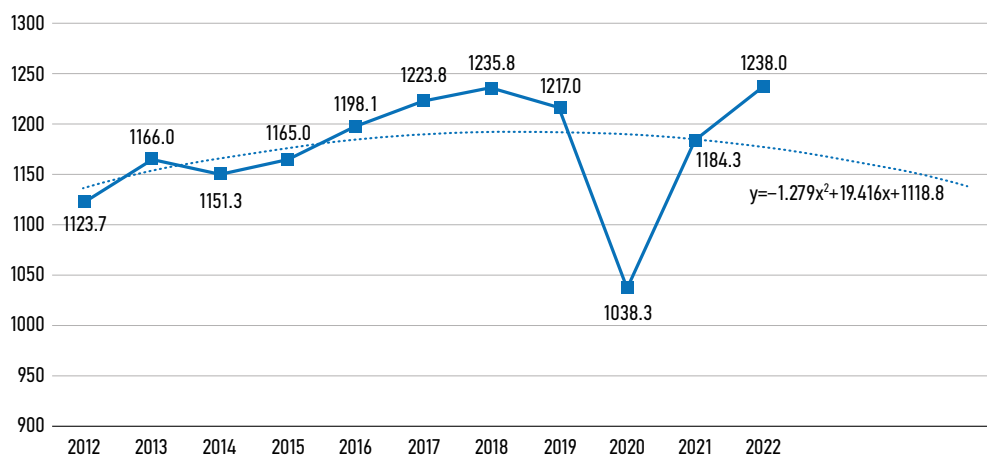


Fig. 1. Number of cases of respiratory diseases among children aged 0–14 years in the Novosibirsk Region from 2012 to 2022 according to Federal State Statistics Service of the Russian Federation (total incidence per 1000 children of the corresponding age).

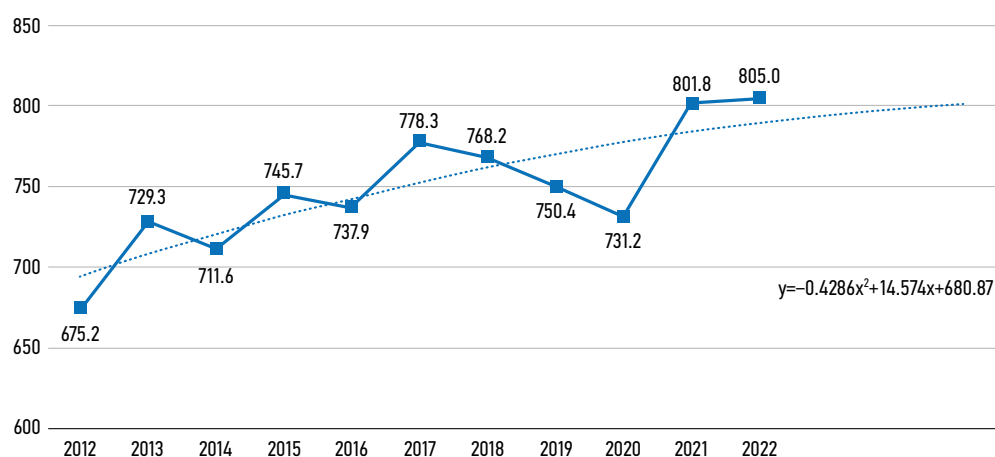


Fig. 2. Number of cases of respiratory diseases among children aged 15–17 years in the Novosibirsk Region from 2012 to 2022 according to Federal State Statistics Service of the Russian Federation (total incidence per 1000 children of the corresponding age).

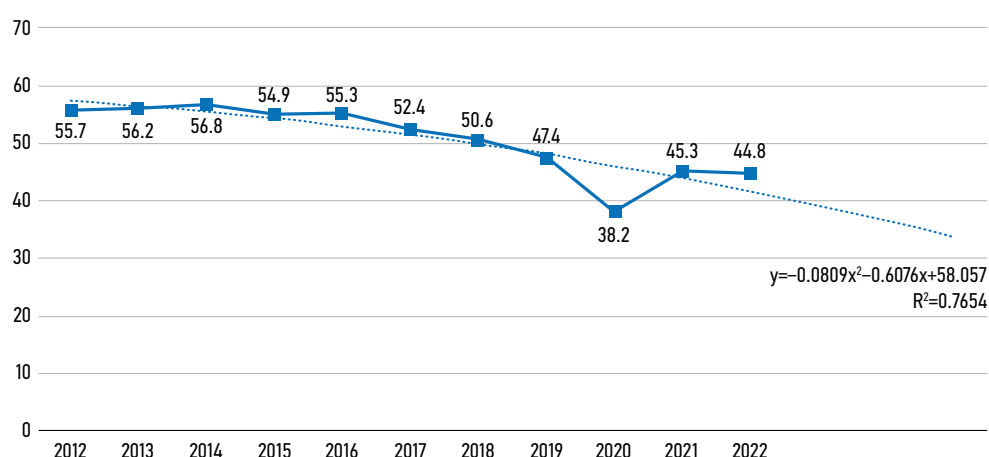


Fig. 3. Number of cases among children aged 0–14 years with ear and mastoid pathology in the Novosibirsk Region from 2012 to 2022 according to Federal State Statistics Service of the Russian Federation (total incidence per 1000 children of the corresponding age).

diseases was observed due to COVID-19 containment measures. Following the lifting of mask mandates and anti-epidemic restrictions in 2021, a sharp increase of 14% in recurrent and chronic respiratory diseases was noted amid the changing epidemiological landscape (Fig. 1).

Over the years of statistical observation, the number of children aged 15 to 17 years with comorbid and multimorbid respiratory diseases varied annually. However, over the same period, an overall increase in morbidity of 19.2% was recorded. In 2020, a slight 2% decrease was observed due to the COVID-19 pandemic. After the cancellation of containment measures in 2021, a sharp 9.5% increase in overall respiratory morbidity was observed (Fig. 2).

When assessing overall morbidity per 1,000 population among children aged 0 to 14 years in the Novosibirsk Region from 2012 to 2022, a positive trend was observed in the prevalence of recurrent and chronic diseases of the ear and mastoid process: this indicator decreased by 19.5% (Fig. 3). In 2020, under COVID-19 containment measures, the number of cases in these diagnostic categories declined by 19.4%. However, by 2021, a sharp 18.5% increase in the number

of registered cases in this group of otorhinolaryngologic disorders was noted.

A similar trend was observed among adolescents during the same period: morbidity associated with diseases of the ear and mastoid process decreased by 11.7% (Fig. 4). In 2020, during the COVID-19 pandemic, a 16.5% drop in overall morbidity was recorded, followed by a 4.6% increase in 2021.

At the same time, high morbidity rates of chronic otitis media were observed among the pediatric population in the Novosibirsk Region (Fig. 5).

The statistical analysis showed that from 2012 to 2022, the incidence of chronic otitis media among children aged 0 to 17 years increased by 74%. This trend is attributed to delayed medical consultations and limited accessibility of otorhinolaryngologic care for the pediatric population in the Novosibirsk Region.

The study of the prevalence of chronic diseases of the tonsils and adenoids among children in the Novosibirsk Region revealed a negative trend.

The statistical data analysis found that the prevalence of chronic diseases of the tonsils and adenoids among children

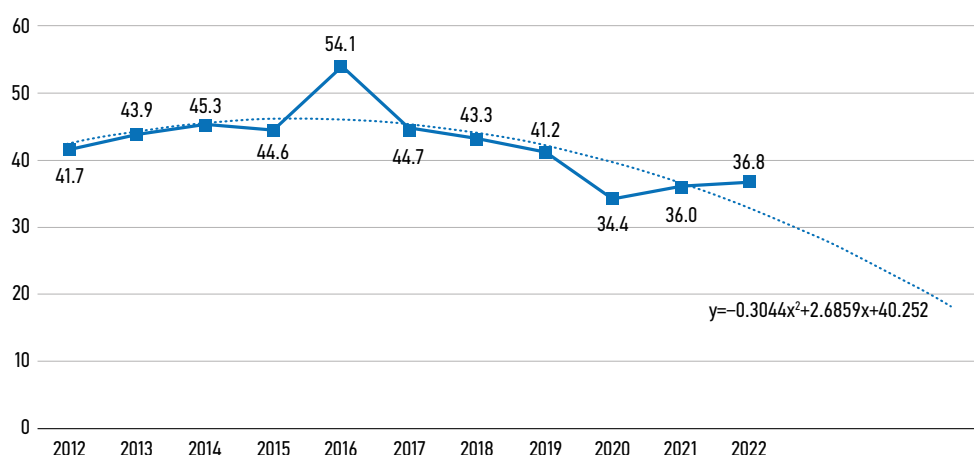


Fig. 4. Number of cases among children aged 15–17 years with ear and mastoid pathology in the Novosibirsk Region from 2012 to 2022 according to Federal State Statistics Service of the Russian Federation (total incidence per 1000 children of the corresponding age).

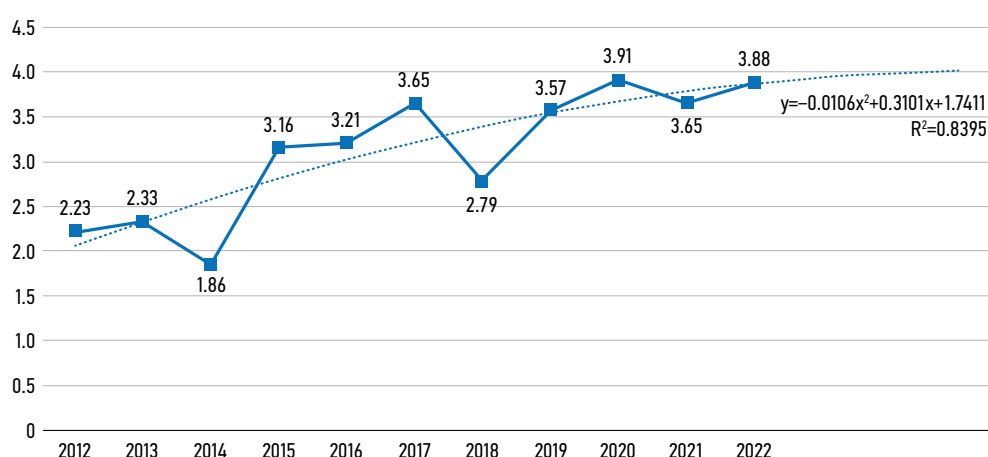


Fig. 5. Number of diseases among children aged 0–17 years with chronic otitis media in the Novosibirsk Region from 2012 to 2022 according to Federal State Statistics Service of the Russian Federation (total incidence per 1000 children of the corresponding age).

aged 0 to 17 years increased by 23% over the study period (Fig. 6). Unfortunately, epidemiological indicators for chronic diseases of the tonsils and adenoids are grouped into a single category. It complicates the objective assessment of specific conditions such as hypertrophy of the palatine and pharyngeal tonsils, chronic adenoiditis, and chronic tonsillitis.

Taking into account the high incidence of chronic diseases of the tonsils and adenoids, examining the proportion of hospitalizations and surgical interventions in this disease area is particularly relevant.

To address this objective, the activities of the otorhinolaryngology department that provides around-the-clock specialized medical care for children in Novosibirsk were analyzed. The study was based on the data from the City Children's Emergency Clinical Hospital, a State Budgetary Healthcare Institution of the Novosibirsk Region, which serves as the primary inpatient facility for the pediatric population residing in Novosibirsk.

During the study (2018–2023), the analysis of the otorhinolaryngology department of the City Children's Emergency Clinical Hospital, the State Budgetary Healthcare Institution of the Novosibirsk Region demonstrated that

both elective and emergency medical care for children was provided in full.

The analysis of the structure of pediatric hospital admissions to the ENT department revealed the following distribution:

Children with chronic diseases of the tonsils and adenoids accounted for 50% of all admissions;

Children with diseases of the ear and mastoid process, 24%;

Children with diseases of the nose and paranasal sinuses, 11%.

Together, these diagnostic categories comprised 85% of all admissions to the specialized otorhinolaryngology department for children aged 0 to 17 years.

An analysis of the number of children referred for inpatient surgical treatment in the ENT department between 2018 and 2023 showed a notable increase in surgical procedures involving the pharyngeal lymphoid ring. Specifically, the number of adenoidectomies and tonsillotomies increased by 79.2%, and the number of adenotonsillotomies rose by 70.6% (Fig. 7). These findings reflect the progression and decompensation of chronic otorhinolaryngologic conditions, necessitating surgical intervention even

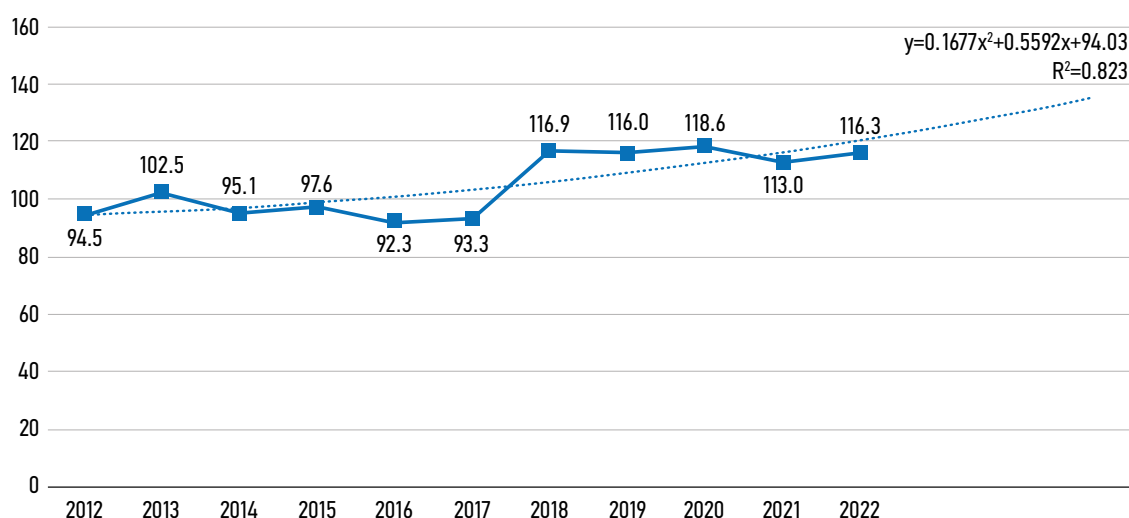


Fig. 6. Number of children aged 0–17 years with chronic diseases of the tonsils and adenoids in the Novosibirsk Region from 2012 to 2022 according to Federal State Statistics Service of the Russian Federation (total incidence per 1000 children of the corresponding age).

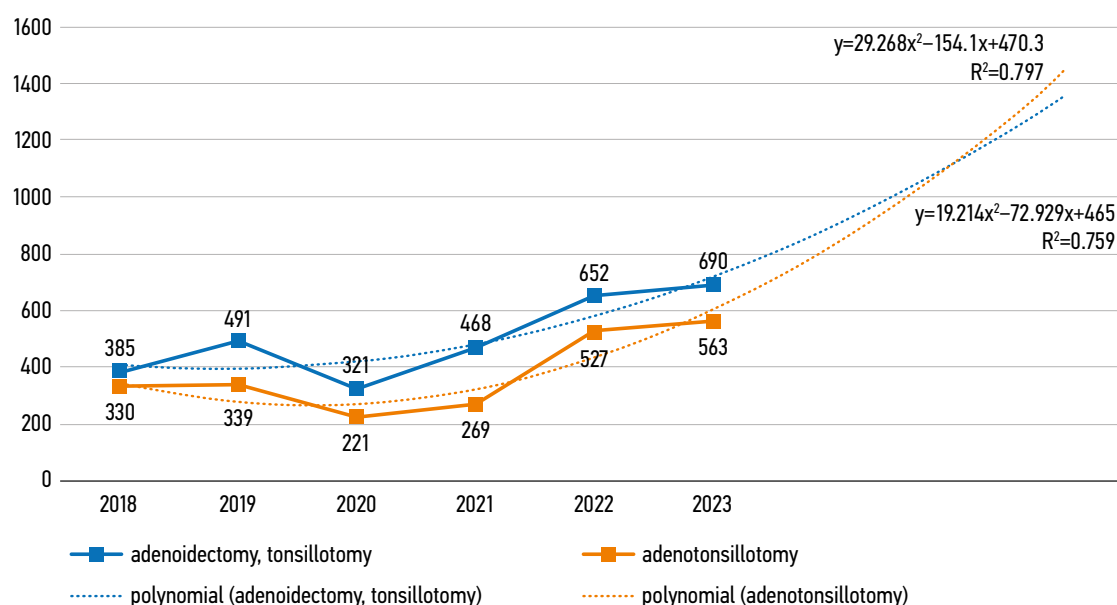


Fig. 7. Number of surgical interventions on the lymphoepithelial pharyngeal ring in children aged 0–17 years from 2018 to 2023 (persons).

within an organ-preserving management strategy for this patient population. All ENT surgeries were performed strictly for clinical indications and established standards of medical care for the respective diagnostic categories. The trend line illustrates the pattern of these changes (see Fig. 7).

CONCLUSION

The conducted analysis identified the structure and prevalence of chronic ENT diseases in children and highlighted key directions for enhancing and optimizing otorhinolaryngological care for the pediatric population.

The study demonstrated a steady annual increase in the prevalence of chronic respiratory diseases among children in the Novosibirsk Region: by 10.1% in the 0–14-year age group and by 19.2% among those aged 15–17 years.

The analysis of regional prevalence of recurrent diseases of the ear and mastoid process demonstrated stabilization and a decline of up to 19.5% among children aged 0–14 years and an 11.7% reduction among adolescents.

However, the overall assessment of ENT morbidity in children revealed a significant increase in chronic conditions across the Novosibirsk Region, suggesting delayed access to specialized care and limited availability of otorhinolaryngological services for the pediatric population.

The high rate of surgical interventions among children reflects the decompensated course of chronic ENT diseases requiring inpatient management and operative treatment. Improved access to timely ENT care at earlier stages of disease is required to reduce the volume of surgical procedures in pediatric otorhinolaryngology.

The analysis of the prevalence of chronic ENT conditions in children serves as an essential indicator of the performance and effectiveness of the healthcare system. The growing burden of chronic ENT pathology and the high rate of hospitalization for surgical treatment highlight the urgent need to develop and implement targeted prevention programs for ENT diseases in the pediatric population.

ADDITIONAL INFORMATION

Author contributions. Yu.I. Bravve: Scientific supervision; O.A. Latukha: Scientific supervision, Concept development, Validation of results; M.M. Shcherba: Conducting the study, Visualization, Writing a draft manuscript, Writing the manuscript—reviewing and editing; I.D. Kiryakova: Formal analysis; R.M. Zablotsky: Administrative management of the research project, Assistance in conducting the study, Providing resources, Investigation; Ya.A. Frolov: Data curation, Validation of results; A.L. Tomchuk: Methodology development, Data

curation. Thereby, all authors made a substantial contribution to the conception of the work, acquisition, analysis, interpretation of data for the work, drafting and revising the work, final approval of the version to be published and agree to be accountable for all aspects of the work. **Funding sources.** No funding.

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