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Analysis Of Diseases Of The Circulatory System Among Children

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Abstract: This article scientifically analyzes the prevalence, main causes, and prevention methods of circulatory system diseases among children. Cardiovascular disorders are among the major health problems in childhood, as they negatively affect physical development, academic performance, and quality of life. The study discusses the pathogenesis, clinical features, and diagnostic methods of congenital and acquired heart defects, arterial hypertension, and anemia. It also highlights preventive measures such as promoting a healthy lifestyle, balanced nutrition, and regular physical activity to reduce the risk of cardiovascular diseases in children. The findings emphasize the importance of early detection and preventive strategies in improving pediatric health and developing effective national programs to combat circulatory system disorders.

Keywords: Child health, circulatory system, heart defects, anemia, hypertension, prevention, pathogenesis, diagnostics.

Introduction: Today, one of the most important medical and social problems that has been relevant for the world community for many years is considered to be diseases of the circulatory system. The etiology and pathogenesis of diseases of the circulatory system (CSD) are complex, multi-stage, and different for each individual disease. They still occupy 1st place in the structure of causes of death of the population (40.5%). At the same time, studies in the field of epidemiology of diseases of the circulatory system (CSD) are representative in nature, they show that these diseases are significantly increasing, becoming younger, and spreading to segments of the population that have not previously encountered such pathologies [1,2,3,4,15].

It is noted that the share of deaths from cardiovascular diseases (CVD) is high not only among adults, but also among children [5].

In urban megacities, that is, in situations where various technogenic environmental factors have a negative impact, the number of visits to medical care and the level of circulatory system diseases can vary significantly between individual polyclinics. This is due to the living conditions of the population in certain urban districts [6,7,8,14].

Today, assessing the level and dynamics of circulatory system diseases among the urban population, as well as their possible causes from a regional perspective, has not lost its relevance. This situation indicates that in the structure of causes of death among the population of Tashkent, circulatory system diseases (CSDs) still occupy a leading position, despite the implementation of state and regional programs aimed at reducing population mortality and improving the quality of cardiological care. It is worth noting that, according to the latest published data, their share among the causes of death is 40.5%, and in 2014–2018, the mortality rate from this cause reached 9.3 cases per 1,000 population [9,10,11,12,13].

Purpose of the study: To conduct a comparative comparison of morbidity rates among the child population in the Tashkent city.

METHODS

The assessment of the level of morbidity among the

child population was carried out based on a differential approach for individual areas within the city. This tactic was chosen taking into account historical factors, since a large part of the population of the Tashkent city area — 75.8% — is assigned to certain polyclinics on a territorial basis.

In particular, 5 children's polyclinics in Tashkent provide medical services to more than 3,000 children under the age of 14 (i.e., approximately 79% of the city's population) and provide the population with medical care on a regional basis. The ranking (division into stages) of morbidity indicators was carried out using a computer program called "Development of criteria for assessing population morbidity indicators" specially developed by the staff of the Department of "Prapedeutics of Children's Diseases" of Tashkent State Medical University [22].

Ушбу усул қуйидаги алгоритм асосида қурилган:

• the multi-year average level (M) is calculated;

• the mean square deviation of the indicators from the multi-year average level (σ) is determined;

• the error of the mean value is calculated (m = σ / √n, where n is the number of observation years);

• the observation data are checked for compliance with the normal distribution based on the “Three Sigma Rule” (3s), that is, almost all values should be in the range from M – 3s to M + 3s;

• on this basis, the following levels are determined:

- high — M + s and above,
- medium-high — from M + 0.5s to M + s,
- medium — from M – 0.5s to M + 0.5s,
- medium-low — from M – s to M – 0.5s,
- low — M – s and below.

According to the results of this analysis, high-risk areas with a high incidence of the disease among the child population were identified.

Research results and their discussion During the study of the general structure of morbidity in children in Tashkent, it was found that childhood cardiovascular diseases (CVD) are not among the five leading classes of diseases. It should be noted that in this case, diseases of the circulatory system (CVD) in children take 8-9th place after diseases of the respiratory system, injuries, poisonings and diseases of the genitourinary system.

For comparison, among the adult population, diseases of the circulatory system (CVD) consistently take 4th place (from 11.1% to 12.5% in the general structure of morbidity over a five-year period) - after diseases of the respiratory system, injuries, poisonings and diseases of the genitourinary system.

In order to optimize the process of improving the healthcare system, as well as to increase the quality of medical care and its delivery to the population, the level of morbidity of the population was chosen as one of the main indicators.

This indicator was determined based on the results of the analysis of data on the number of diseases registered among patients living in the territory served by the medical organization. The above data are based on data obtained from referrals to children's clinics, especially among children under 14 years of age.

On this basis, an approach was developed to assess the level of morbidity of circulatory system diseases among the pediatric population, which is reflected in the form No. 12 of the State Statistics Service - "Information on the number of diseases registered among patients living in the territory served by the medical organization".

The study was carried out in the databases of the Tashkent State Medical University in 2014-2018, covering the age group of children under 14 years of age.

In this regard, intensive indicators were calculated based on the number of cases of the disease per 1000 people in each age group of the population (children under 14 years old), and the average multi-year level of the disease (M) was determined. The dynamics of the indicators were assessed by the growth rate of the disease in the last year (2018) compared to the initial year of the approved period (2014), which was carried out using intensive disease indicators for the age group of children under 14 years old (table 1).

1 Table

The incidence of circulatory system diseases in urban children

Youth group	Years					Average level M±m	Growth rate
	2021	2022	2023	2024	2025		

							compared to 2021
Number of people presenting with this disease (per 1,000 children of this age)							
Children under 14 years old	18,6	20,3	19,7	18,6	15,5	23,68±1,35	5,11
Diagnosed for the first time in their lives (per 1,000 children of this age)							
Children under 14 years old	7,68	13,5	15,40	15,90	16,88	10,40±1,35	32,11

The risk areas were identified as a result of ranking the indicators using the average multi-year incidence rate (M), the squared deviation of the indicators from the average multi-year level (σ), and an algorithm for determining the rank boundaries on this basis.

It turned out that, according to the average multi-year incidence rate of circulatory system diseases among children, areas with more than 15.65 cases of the disease per 1000 children are considered dangerous. Such areas include the service areas of the following children's polyclinics:

- Polyclinic No. 13 — 20.40 ± 1.50 cases,
- Polyclinic No. 12 — 12.65 ± 0.42 cases (table 2).

Table 2 Diseases of the blood circulation system in the children's population according to information on medical assistance

Medical organizations	Years					M±m	Growth rate from 2021
	2021	2022	2023	2024	2025		
№1 Family polyclinic	1,89	1,54	1,67	2,08	2,20	1,87±0,17	13,82
№10 Family polyclinic	9,26	8,25	9,58	14,12	14,80	11,22±2,01	36,65

№11 Family polyclinic	12,30	9,68	12,10	11,86	12,50	11,69±0,75	1,28
№12 Family polyclinic	11,65	12,25	13,48	12,75	13,20	12,65±0,42	10,50
№13 Family polyclinic	23,31	18,40	20,65	19,15	20,12	20,40±1,50	-20,80

Using data from 5 state children's polyclinic medical institutions, scales for assessing morbidity indicators were developed and urban areas were ranked according to the level of pathology under study. At the same time, an increase in the level of morbidity was observed in 3 of the 5 urban areas: over five years, the growth rate ranged from 1.36% (Children's Polyclinic No. 11) to 55.30% (Children's Polyclinic No. 10). The average multi-year level of cardiovascular diseases in the Tashkent city district is 20.40 ± 1.50 cases per 1,000 children under 14 years of age. Over the past 5 years (2021-2025), an increase in the incidence of the child population has been observed: the growth rate in the number of cases seeking medical help was 5.11%; The number of children diagnosed for the first time in their lives was 21.11%.

It should be noted that the average long-term rate of cardiovascular diseases in the adult population (403.14 ± 21.36 cases per 1000 population aged 18 and older) is 16.3 times higher than in children under 14 years of age, which is consistent with the results of other studies. The structure of CVD in the children's population differs significantly from the same structure in the adult population.

Thus, in the adult population of the Tashkent city region, diseases characterized by high blood pressure dominate in the structure of CVD - 51.8%, cerebrovascular diseases - 18.1%, ischemic heart diseases - 16.8%, in the structure of CVD in the children's population these nosologies were 1.8; 0.1 and 0.05%. Among those recorded in the form of state statistical report No. 12 "Data on the number of diseases registered in patients living in the territory served by a medical organization", diseases of the veins, lymphatic vessels and lymph nodes (2.4%) are most often recorded among the children's population, while the majority of cases of cardiovascular diseases in children are included in the category of "other heart diseases", which is recorded in more than 20 nosologies.

Due to the lack of improvement in the statistical accounting of children's diseases, additional selective studies are required in the future to determine the structure of the CRC in the children's population. The results of the analysis of the incidence of certain diseases of the cardiovascular system in the adult population in the urban areas of the Tashkent city district have been previously published, and so far there are significant differences in their values.

Such differences in indicators can be explained by various factors, including the composition of the population of a given region, the staffing of the medical organization, including the presence or absence of a cardiologist. At the same time, our study revealed regional patterns in the formation of the structure, level and dynamics of the incidence of IBD in the pediatric population based on data on the population's appeal for medical care. According to the results of the study, an author's five-point assessment scale was developed, which was used to compile and analyze the incidence of IBD in the pediatric population in separate areas within the city - service areas of polyclinics, which is a practically important element for developing proposals for improving the organization of the network of healthcare institutions, taking into account the identified territorial characteristics.

CONCLUSION

The observed differences in morbidity rates in individual urban areas served by children's clinics can be explained by various factors, including the age structure of the population of a particular area, the staffing of the medical institution, including the presence or absence of a pediatric cardiologist. Knowledge of data on childhood morbidity in individual urban areas allows us to rationally optimize the resources of the urban healthcare system to improve and increase the quality of medical care for the population with cardiovascular diseases at the pre-hospital stage.

In addition, each region of Russia has its own

characteristics: climatic differences, adverse weather conditions for human health, sharp changes in geomagnetic and solar activity, sharp changes in air temperature during the day (increase or decrease in temperature by 8 °C or more), heat (above +25 °C) or severe cold (below -20 °C), changes in atmospheric pressure (more than 6 mm of mercury during the day), strong wind (8 m/s or more), high humidity (80% or more). This requires clarification of the list of regional risk factors affecting the occurrence and exacerbation of cardiovascular diseases. Such studies have not been conducted among children under 14 years of age living in Tashkent. The above justified the urgency of conducting the following stages of the study - studying the influence of weather factors on the number of people seeking medical help with cardiovascular diseases; analysis of the level of medical care of the population of the city (the structure of medical organizations, the completeness and professional level of human resources, the distribution of health care resources for pre-hospital and in-hospital medical care) and others.

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