Clinical examination of the children's population by an outpatient ophthalmologist: its effectiveness and expediency

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Abstract. Purpose - to analyze the effectiveness of prophylactic medical examination of the child population by an ophthalmologist of a district polyclinic for three years. **Material and methods.** A retrospective analysis of the work of an ophthalmologist of the State Budgetary Healthcare Institution of Tyumen Oblast "Oblast Hospital № 19" (Tyumen) for 2018-2020 was carried out**. Results.** The structure of the child population of the analyzed polyclinic showed the general tendency of the medical and demographic situation in Tyumen Oblast - an increase in the child population subject to dispensary examination. The analysis of the revealed pathology during preventive examinations of the child revealed that most of it is accounted for by refractive pathology: myopia, hyperopia, violation of accommodation - in 2018 - 91.7%, in 2019 - 91.8%. In a detailed analysis of pathologies in preschool institutions, the first place is taken by hyperopia (36%). In second place is myopia (24-27%), in third place is accommodation disorder (17-25%). In school-age children, according to medical examinations, myopia is in the first place (46%). **Conclusion.** Analysis of the effectiveness of clinical examination in dynamics for 3 years in children revealed that the indicators of eye pathology are practically at the same level (consistently high), refractive and functional pathology prevails - myopia, hyperopia, and accommodation

disorder. Conducting clinical examination contributes to the early detection of pathology at the stage of functional disorders, which are successfully amenable to conservative treatment.

Keywords: clinical examination, preventive examination, children's population, preschool, myopia, hyperopia.

Relevance. At the present stage, according to the order of the Ministry of Health of the RF of August 10, 2017 № 514n "On the Procedure for conducting preventive medical examinations of minors" (changes from 13.06.2019, order of the Ministry of Health of theRF № 396n), outpatient doctors are actively conducting clinical examination of the child population. In modern scientific literature, there are works devoted to the effectiveness of the ongoing medical examination, and the inexpediency of its implementation from an economic point of view [1, 2]. However, some authors talk about the need for early treatment of binocular vision pathology [3]. In addition, the increase in patients with refractive amblyopia, emphasizes the relevance of clinical examination, both in organized and unorganized populations in order to increase the diagnosis of refractive errors in childhood. This is necessary for early rehabilitation measures, both conservative and surgical methods of treatment [4]. The medical and demographic situation in Tyumen Oblast has undergone some changes: in general, the number of both children and adults and persons subject to prophylactic medical examination has increased [5].

The data obtained as a result of clinical examination can be used to make organizational decisions in order to increase the effectiveness of rehabilitation measures in the conditions of the polyclinic link, day and round-the-clock hospitals.

Purpose of the study. To analyze the effectiveness of prophylactic medical examination of the child population by an ophthalmologist at a district polyclinic for three years.

Material and methods. A retrospective analysis of the report of the ophthalmologist SBHCI TO "Oblast Hospital № 19" for 2018-2020 was carried out. The polyclinic serves 114,421 people, of which 27,723 (24.2%) are children aged 0 to 17 years. 31,152 (27.2%) people live in the service area of feldsher-obstetric stations. Among the child population, according to the order, 9725 (35.1%) were subject to medical examination in 2018, 9815 (35.4%) in 2019. Since March 2020, due to the COVID 19 pandemic, preventive examinations and medical examination of the population have not been carried out (only 300 preschool children were examined).

Results and discussion. The age structure of the child population examined by an ophthalmologist as part of a clinical examination is presented in tab. 1 and corresponds to the average statistical indicators for the Russian Federation [6].

Table 1 - Age composition of the child population examined by an ophthalmologist as part of a clinical examination

Years	**2018**	**2019**	**2020**

Total	9725 (100%)	9815 (100%)	300 (100%)
Children 7-17 years old	6125 (63%)	6320 (64.4%)	-
Children 1-6 years old	3600 (37%)	3495 (35.6%)	300 (100%)

The structure of the child population of the analyzed polyclinic showed the general tendency of the medical and demographic situation in Tyumen Oblast - an increase in the child population subject to dispensary examination by 232 children (tab. 2). In the structure of the child population, 71.4% are children attending kindergartens and schools, the share of unorganized children is 28.6%.

Table 2 – The structure of the child population of the Tyumen region

Years	**2018**		**2019**		**2020**	
Values	Abs.n.	%	Abs.n.	%	Abs.n.	%
Total amount	21871	100	21986	100	22103	100
Children under 1 year	1320	6.0	1332	6.0	1354	6.1
Unorganized	4934	22.6	4952	22.5	4976	22.5
Kindergartens	5128	23.4	5179	23.6	5192	23.5
Schoolchildren	9286	42.5	9301	42.3	9340	42.3
Adolescents	1203	5.5	1222	5.6	1241	5.6

The analysis of the revealed pathology during preventive examinations of the child population showed that most of it is due to refractive pathology: myopia, hyperopia, violation of accommodation - in 2018 - 91.7%, in 2019 - 91.8%. The pathology of binocular vision accounts for - in 2018 - 4.5%, in 2019 - 4.3%. The indicators are presented in tab. 3.

Table 3 - The structure of the revealed pathology during preventive examinations

Years	**2018**		**2019**		**2020**	
Values	Abs.n.	%	Abs.n.	%	Abs.n.	%
Total	3800	100	3890	100	97	100
Disturbance of accommodation	585	15.4	589	15.1	10	10.3
Myopia	1500	39.5	1570	40.4	35	36.1
Strabismus	170	4.5	168	4.3	3	3.1
Hypermetropia	1400	36.8	1412	36.3	34	35.1
Amblyopia	130	3.4	135	3.5	13	13.4

CPVO	15	0.4	16	0.4	2	2.1

In general, in the period from 2018-2019. there is an upward trend in eye diseases (by 90 people during 2019). The data for 2020 is not very informative, this situation is associated with the introduced quarantine measures in connection with Covid-19.

A detailed analysis of pathologies in preschool institutions (hereinafter PI) is presented in tab. 4, 5. The first place among the revealed pathology in preschool children is taken by hyperopia. In most cases, it is the physiological norm for the development of the visual system. In second place is myopia, in third place is a violation of accommodation. This can be explained by the early acquaintance of children with various gadgets, PCs, TVs, uncontrolled and prolonged use, inheritance of myopia.

Table 4 - Indicators of preventive examinations in preschool institutions

Years	Subject to examination	Examined	Med. examination coverage	Children with diseases revealed, total	
	Abs.n.	Abs.n.	%	Abs.n.	%
2018	2500	2500	100	595	23.8
2019	2624	2624	100	684	26.1
2020	2491	300	12.0	97	32.3

Table 5 - The structure of the identified pathology in PI

Years	**2018**		**2019**		**2020**	
Values	Abs.n.	%	Abs.n.	%	Abs.n.	%
Myopia	166	27.9	170	24.9	35	36.1
Hypermetropia	253	42.5	270	39.5	34	35.1
Disturbance of accommodation	104	17.5	171	25.0	10	10.3
Strabismus	36	6.1	35	5.1	3	3.1
Amblyopia	30	5.0	32	4.7	13	13.4
CPVO	6	1.0	6	0.9	2	2.1

Analyzing the data of preventive examinations of schoolchildren (tab. 6.7), we can say that in children of this category, myopia is in the first place. This situation is associated, from our point of view, with the following factors:

- digitalization of education, carried out in the country since 2016, and since 2018 implemented within the framework of the national project "Digital School", has significantly intensified the use of digital teaching aids in schools (interactive whiteboards and panels, computers, electronic tablets, etc.);

- the use of electronic gadgets with liquid crystal screens (smartphones, computers, laptops, electronic tablets) at leisure and at home when preparing lessons, searching for information, electronic games, communicating on social networks;

- in connection with the Covid-19 pandemic, educational organizations in Russia switched to distance learning, which remained until the end of the 2019/2020 academic year. Long-term and irrationally organized use of electronic gadgets dramatically increases the load of the visual analyzer, which cannot but lead to the development of visual impairments and computer visual syndrome.

Table 6 - Indicators of preventive examinations by schools

Years	Subject to examination	Examined	Med. examination coverage	Children with diseases revealed, total	
	Abs.n.	Abs.n.	%	Abs.n.	%
2018	6125	6125	100	2800	45.7
2019	6320	6320	100	2850	46.5
2020	5521	-	-	-	-

For the period 2018-2019, there is no significant dynamics in the detection of vision pathology. In the period 2020, clinical examination was not performed due to the introduced quarantine measures.

Table 7 - The structure of the revealed pathology in schools

Years	**2018**		**2019**		**2020**	
Values	Abs.n.	%	Abs.n.	%	Abs.n.	%
Myopia	1300	46.4	1320	46.3	-	-
Hypermetropia	800	28.6	770	27.0	-	-
Disturbance of accommodation	500	17.9	563	19.8	-	-
Strabismus	90	3.2	91	3.2	-	-
Amblyopia	100	3.6	96	3.4	-	-
CPVO	10	0.4	10	0.4	-	-

In the general picture, having analyzed the indicators of clinical examination for three years, it can be concluded that the indicators of the revealed pathology are practically at the same level

(indicators are consistently high). In all age categories of children, refractive and functional pathology prevails - myopia, hyperopia, accommodation disorder.

Conclusions. In preschool children, hyperopia comes out on top, which, more often, is a natural stage of refractogenesis. In schoolchildren, myopic refraction comes first. This can be attributed to excessive eye strain while reading, watching TV and spending a long time at a PC and various gadgets. Conducting clinical examination contributes to the early detection of pathology at the stage of functional disorders, which are successfully amenable to conservative treatment.

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