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Analysis of Anthropometric Parameters of Physical Development of Children with Adenoid Hypertrophy Before and After Adenoidectomy

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Annotation: The proportion of children with chronic adenotonsillitis varies from 20 to 50 per cent, and 37 to 70 per cent of frequently ill children. This indicates an increase in pharyngeal tonsil hypertrophy, an increase in the incidence of adenoid pathology in children, which adversely affects the structural formation of the jaw complex. It has been revealed that the influence of the long-term course of diseases in children leads to a violation of the formation of the facial skeleton, which is reflected in the form of a sagging lower jaw, its narrowing and distant, improper development of the hard palate and occlusion. In the development of dentoalveolar anomalies at the age of 8-10 years, diseases of the ENT organs, in particular, overgrowth of adenoids, play a significant role.

Keywords: Anthropometry, adenoidectomy, adenoid hypertrophy, children

INTRODUCTION

Objective: to analyze the parameters of physical development of children aged 3-11 years and children with adenoid hypertrophy

Materials and methods: The study was carried out on the basis of the ENT department of the Bukhara Oblast Children's Hospital. The number of children before and after adenotomy surgery was 348 (181 boys and 167 girls). Accordingly, in children with adenoid hypertrophy and 6 months after surgery, body length was measured with a height gauge, body weight with special medical scales, and chest circumference with a measuring tape. During the same periods, a survey of parents was conducted on a 10-point scale to assess the overall children's condition (Table 1).

The subject of the study was the anthropometric parameters of the head and face. In the course of scientific research, a set of methods was used, depending on the tasks set: anthropometric, morphometric, statistical methods.

Introduction. Although there have been advances in the diagnosis and treatment of adenoids in children, they are diagnosed quite late. As a result, it harms the quality of treatment for patients (Skordis N et al., 2012).

The growth and development of the human body from the embryonic stage to its adult state is a very complex phenomenon consisting of many changes under the neuro-humoral regulatory mechanisms that control the differentiation, development and maturation of organs and systems. Various causes, both familial and pathological, can affect the growth parameters of different parts of the human body

Knowledge of the patterns of growth and development of facial bones will help prevent an increase in the number of disorders in the maxillofacial region (D.A. Domenyuk, 2016).

The number of works devoted to the study of the morphogenesis of the craniofacial complex in childhood in one or another pathology, especially in hypertrophy of the pharyngeal tonsil, is extremely limited. It is known from the literature that the maxillofacial region undergoes radical transformations in the process of development. (V.T. Yagupova, 2019).

In the literature, mental stress (Lukina S.F. et al., 2012) affects the physical and functional development of children (Mazen Mohammed Youssef Hassan Hussein, 2014).

The mechanisms that regulate the growth of a person's head and face are complex processes where there is an interaction between hormones and epigenetic factors. The above factors determine the formation of craniofacial bones, the disruption of which can lead to irreversible changes in this area (Juloski J. et al., 2016).

When the interaction of regulatory factors for the growth of the bones of the facial skeleton is disrupted, there is an unequal slowdown in bone growth, which leads to abnormalities in the formation of the face. In various genetic abnormalities or syndromic pathologies, there is a delay in the development of the dentition (Haynes A, Bulsara MK., 2012).

Knowledge of facial dysmorphic traits is important in diagnosing many congenital diseases, such as Down syndrome or alcoholic fetal disease (Koca C.F. et al, 2016, Suttie M. et al, 2018). Some chronic diseases that occur during development can lead to abnormalities in facial parameters. The group particularly susceptible to the development of craniofacial anomalies are children with chronic nasopharyngeal obstruction, who often have mouth breathing. In the long term, mouth breathing can lead to an increase in the anterior height of the face, a retrognathic lower jaw, a steep angle of the mandible, inadequate lips, and narrow maxillary and mandibular dental arches. The combination of these changes is usually called

"adenoid face" because it is characteristic of children with hypertrophy of the adenoids and tonsils (Nagaeva T.A. et al., 2016, Tastanova G. et al., 2021, Koval Y.N. et al., 2021).

The mechanistic nature of abnormal facial growth in children is a consequence of adenotonsillar hypertrophy. The classical model suggests that an unclear inflammatory process or infection leads to hypertrophy of the adenoids or tonsils. Enlarged adenoids and tonsils block the upper airway and force the baby to breathe through the mouth. (Arsenina O. I. et al. 2014) due to weak stimulation of local bones (Pawłowska-Seredyńska K. et al. 2020, Chuang H. H. et al. 2020).

An open mouth often results in a downward tongue position, which can lead to a low position of the lower jaw and head. However, there is evidence that children with adenoids and tonsil hypertrophy have abnormal nocturnal hormone secretion. It has been proven that a decrease in growth hormone secretion may be associated with posterior face size due to a short branch of the lower jaw (Tastanova G.E., Khodzhanov Sh., 2021).

Results. Long-term chronic inflammatory pathology of the tonsils of the lymphoepithelial ring of the pharynx leads to secondary immune deficiency in the pediatric population, which reduces the quality of life of the child and family. Growth retardation in children with adenoid hypertrophy has been frequently reported (27–56%). Hypertrophy of the adenoids is the main cause of developmental or retardation of physical and mental development in children, and usually ended with adenoidectomy.

Table 1.

Distribution by age and sex of the total number of examined children with adenoids before and after surgery

Age	Before Surgery						After Surgery					
	Floor											
	Boys			Girls			Boys			Girls		
	abs	M (%)	m	abs	M (%)	m	abs	M (%)	m	abs	M (%)	m
3 years	10	4,29	1,33	9	4,3	1,40	9	4,9	1,62	6	3,59	1,44
4 years	12	5,15	1,45	8	3,8	1,32	8	4,4	1,53	7	4,19	1,55
5 years	19	8,15	1,79	22	10,5	2,11	16	8,8	2,11	16	9,58	2,28
6 years	22	9,44	1,92	19	9,1	1,98	18	9,9	2,22	12	7,19	2,00
7 years	29	12,5	2,16	21	10,0	2,07	22	12,2	2,43	19	11,4	2,46
8 years	32	13,7	2,25	31	14,8	2,45	26	14,4	2,61	23	13,8	2,67
9 years	30	12,9	2,19	28	13,3	2,35	23	12,7	2,48	21	12,6	2,57
10 years	28	12,0	2,13	25	11,9	2,23	15	8,3	2,05	18	10,8	2,40
11 years	26	11,2	2,06	26	12,38	2,27	20	11,1	2,33	24	14,4	2,71
Altogether	233	100,0	0,00	210	100,0	0,00	181	100,0	0,00	167	100,0	0,00
R	Pearson's chi-square = 1.985; p = 0.992						Pearson's Chi-square = 2.638; p = 0.977					

Pathology of the pharyngeal tonsil more often ($p<0.05$) has a negative impact on the growth and body weight of the growing body of children, therefore, in children with chronic pathologies of the ENT organs, there is a discrepancy in weight, that is, excess or deficiency of body weight. But in children with pathology of the ENT organs, the excess body weight is more detected. After adenoidectomy and facilitation of nasal breathing, accelerated growth of the lower jaw and closure of the angle of the mandibular plane were noted. All proven factors can

be improved after adenoidectomy due to the fact that children with normal and overweight after adenoidectomy or without it can gain weight quickly.

There is a lack of research on the effects of adenoidectomy, taking into account the effect of time and the state of preoperative growth.

Parents were asked to respond to a questionnaire about their children. Questions regarding the degree of adenoid hypertrophy and/or the presence of tonsil hypertrophy were included in the questionnaire. In addition, the specific symptoms associated with these diseases have been studied.

In addition, the patient's overall score was assessed on a scale from 0 (remission) to 10 (maximum symptomatology). Each object was examined before and after surgery. A detailed form was filled out for each child. Differences in scores attributed to the patient's overall score before and after social distancing were assessed using *the Student's* t-test.

There were insignificant sex ratios in all anthropometric measurements of the subjects. However, girls had higher body weight, while they lagged behind in height but had higher BMI and chest circumference (Table 2)

Table 2

Anthropometric characteristics of comparison between boys and girls with adenoids before and after adenoidectomy

Floor	Boys		Girls	
Period	Before	After	Before	after
Weight (kg)	16,39±4,15	17,42±3,25	20,25±6,02	21,5±5,02
Height (cm)	105±9,07	109±8,03	102,6±5,09	108,6±4,09
Chest circumference (cm)	53,6±3,05	54,5±3,04	55,8±4,06	56,1±3,09
BMI (kg/m2)	15,8±5,12	15,9±4,09	20,6±1,75	22,3±3,09

In all anthropometric measurements studied, there were slight sex differences, as well as the incidence of growth disorders. A slight statistical difference was found between children of childhood 1 and 2 and children with grade 3 and 4 adenoid hypertrophy on all anthropometric measurements.

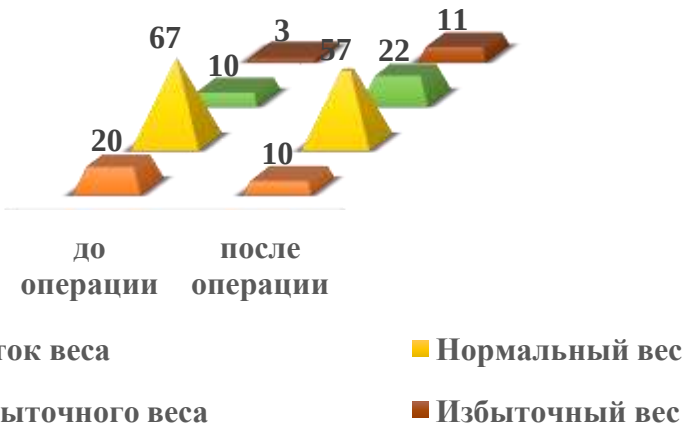

Figure 1. BMI in children before and after surgery (%)

The present study was designed to evaluate the relationship between the severity of chronic adenotonsillar hypertrophy and its impact on physical development. The predominance of the female sex in all aspects was revealed. These parameters differ from

previous researchers,

However, they also reported that their height in both sexes was within the normal range. Kartal et al. observed that the percentiles of weight and height were normal in most patients. Vontetsianos et al. In their study, they observed minor sex differences in weight and height in children with adenotonsillar hypertrophy.

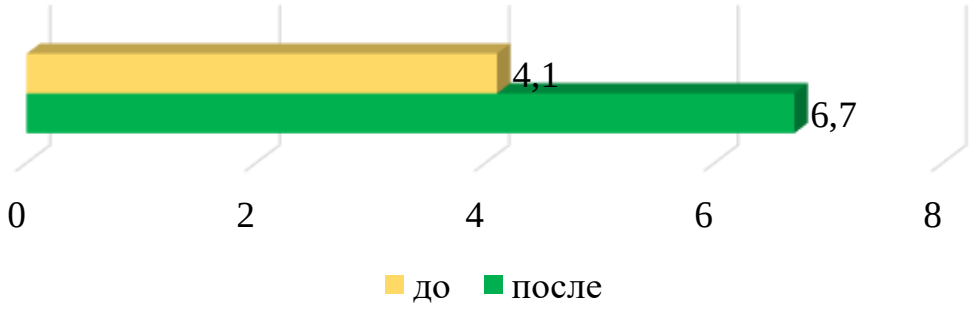

Figure 2. Pre- and post-operative assessments of children

Thus, adenoid hypertrophy (HA) had a significant impact on the anthropometric measurements of children. In all anthropometric studies, sex differences and growth disorders were revealed. This has a negative effect on growth mainly in boys. After adenotomy, all anthropometric parameters (body weight, height and chest circumference) change 1.5 times and the results are more pronounced in girls.

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