RELATIONSHIP OF AGE AND DYNAMICS OF PHYSICAL DEVELOPMENT OF CHILDREN AND ADOLESCENTS IN FERGANA IN ONTOGENESIS

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ABSTRACT

The article discusses the relationship between age and the dynamics of physical development of children and adolescents into ontogenesis.

KEYWORDS:- Ontogenesis, physical development, morphofunctional, anthropometry.

INTRODUCTION

The physical development of a growing organism is one of the main indicators of a child's health. The more significant the disturbances in the physical development of the child, the greater the likelihood of having the disease. Obeying biological laws, physical development depends on many factors: heredity, climate, nutritional characteristics, and the level of material security of the family, compliance with the regime - and is used by hygienic science as an indicator of the sanitary and epidemiological well-being of the population. At present, the indicators of the physical development of children and adolescents are analyzed for the ecological and hygienic assessment of the state of the territory, the analysis of the influence of social factors, the conditions of upbringing, education, the organization of leisure and recreation, the labor activity of children and adolescents.

Observation of the physical development of children and adolescents to follow to understand not only the morphological and functional properties that ultimately determine the stock of his physical strength, but those biological processes that are especially characteristic of the child's body. Such processes, first of all, should be considered the growth and formation of the organism.

Human growth and development is a complex process caused by profound changes in the structure and function of tissues of individual organs and the body as a whole and proceeding under the influence of external and internal factors, inextricably linked and determining each other.

Most of the anthropometric signs of a person's physical development, as a rule, are associated with growth indicators, however, it would be a mistake to draw conclusions about a person's physical development based on only one height.

The point of view that body length is a sign of the strength of the body has not been confirmed over time, and ultimately, growth began to be considered in conjunction with other signs, and primarily with chest girth and body weight.

The purpose of this work is to analyze the level and dynamics of physical development of children and adolescents ontogenesis.

Research objectives:

1) determine the absolute level of gain, growth rates and gains of the main parameters of physical development (standing height, body weight, chest circumference at rest);

2) to determine the dynamics and level of physical development of children and adolescents in the city of Fergana. Study the dynamics of the main features in relation to age and the alignment of the empirical curve.

To solve these problems, a single examination of the main and additional characteristics of the parameters of physical development was carried out according to 20 signs. Anthropometric signs were examined using a unified technique.

Results of the research and their discussion: The research was carried out in the city of Fergana (on the basis of kindergarten No. 4, secondary school No. 10 and FagGU). The total number of examinations of adolescents and children is 430 people.

To analyze the dynamics of data, characteristics of growth and development of dimensional characteristics, the following indicators were used:

1) The absolute results of dimensional characteristics at certain age periods;

2) Absolute increments of dimensional characteristics, i.e. the difference between the absolute indicator of the dimensional indicator in a given age period and the absolute indicator of the dimensional indicator in the previous age period;

3) The growth rate, expressed by the ratio of the absolute indicator of a dimensional characteristic in a given age period to the absolute indicator of the same dimensional characteristic in the previous age period;

4) Growth rate - the percentage ratio between the absolute growth of a dimensional attribute during a certain period of time to the absolute level of the indicator in the previous period.

As you know, in children and adolescents, there is a constant tendency to an increase in dimensional characteristics - a progressive stage.

$$y = a + b \cdot x$$

where, y is the actual numerical value of the studied trait,

x - conditional numbering of each age period.

Based on this formula, a line can be drawn to represent the dynamics of the process. The following system of equations is used for calculations:

$$y' = a + b \cdot x$$

$$\sum y = a \cdot n + b \sum x$$

(1)

$$\sum y x = a \sum x + b \sum x^2$$

where, y ^are the theoretical numerical values of the studied dimensional characteristic, Σ is the summation sign.

To calculate the growth rate of dimensional characteristics, Minot's formulas were used:

$$W = \frac{100(M_2 - M_1)}{M_0} \% \qquad (2)$$

Where M_1 is the size of the trait at the age of t_1

M_2 - value of the same trait at age t_2

M_3 - the absolute value of this trait at the age of 6

Table 1 shows the growth rates of standing children and adolescents in the city. Fergana. Analysis of the data obtained shows that during the school period there is a continuous increase in indicators of all ages. Increases in growth rates and annual gains are statistically significant in most age groups.

The variability of growth indicators (V) in children and adolescents of the studied ages is small and varies within   V=0,42·5,4%.

More accurate in the study of growth processes is the analysis of not only the absolute values of sizes, but also their transformation per unit of time. The absolute increase in standing growth indicators during the studied age period is unevenly distributed. At the age of 6-7 years, the absolute increase in body length is 6.09 cm. This indicator gradually decreases with increasing age. In puberty, an increase in absolute body growth begins again: at 11-12 years old - by 8.23 cm, at 12-13 years old - by 6.77 cm, at 13-14 years old - by 8.09 cm.

After the transition period, the gain in absolute body height gradually decreases. At 16-19 years old, it is 1.6 cm - a stable stage.

This pattern of uneven growth of children has been noted by many authors and is probably a general biological indicator in children and adolescents. The average annual increase in height up to 16 years is 5.1 cm.

Table 1

Growth dynamics of standing children and adolescents in the city of Fergana at the age from 6 to 19 years

Age (years)		Standing height			Shifts of each subsequent group in comparison with the previous one			
		$M \pm m$	σ	V	Absolute growth (cm)	Growth rate (%)	t	p
6	0	112,0± 0,91	,0	,4	-	-	-	-
7	4	118,09 ±0,83	,4	,4	6,09	5,12	4 ,00	0 ,001
8	0	123,91 ±0,70	,4	,6	5,82	4,69	4 ,95	0 ,001

9	7	129,66 ±0,70	,2	,2	5,75	4,46	4 ,48	0 ,001
10	4	133,13 ±0,36	,0	,5	3,47	2,60	4 ,20	0 ,001
11	9	135,1± 1,22	,36	,9	2,0	1,48	1 ,60	0 ,0
12	2	143,33 ±1,1	,2	,42	8,23	5.75	3 ,71	0 ,001
13	6	150,00 ± 1,0	,2	,4	6,77	4.50	3 ,70	0 ,001
14	9	158,09 ±1,28	,0	,4	8,09	5.10	2 ,41	0 ,02
15	8	162,1 ±1,81	,79	,8	4,0	2.47	1 ,70	0 ,1
16	4	166,4± 1,70	,83	,5	4,3	2.60	1 ,00	0 ,0
16-19	0	168,0± 0,70	,4	,2	1,6	0.96	0 ,90	0 ,0

Weight is one of the important indicators of health, physical development, human performance. It determines body weight. This indicator is widely used to assess the level of physical development in all children's educational and educational institutions. He is very sensitive to the effects of various environmental factors.

The results of weight indicators for children and adolescents 6-19 years old in the city of Fergana are shown in Table 2. The absolute increase in weight indicators in dynamics by age with an interval of a year turned out to be uneven. During the entire preschool and school period, there is an intense increase in weight. The annual weight gain is 3.55 kg. The greatest weight gain is observed during the transitional age.
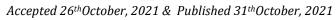
Table 2

Growth dynamics of standing children and adolescents in the city of Fergana at the age from 6 to 19 years

Age (years)		Standing height			Shifts of each subsequent group in comparison with the previous one			
		$M \pm m$	σ	V	Absolute gain (cm)	Growth rate (%)	t	p
6	0	19,25± 0,37	,0	0,0	-	-	-	-
7	4	21,73± 0,42	,8	2,6	2,48	11,4	8 ,07	0 ,001
8	0	24,25± 0,38	,4	,7	3,52	14,5	1 1,00	0 ,001
9	7	26,93± 0,83	,0	1,0	2,68	10,0	3 ,40	0 ,001
10	4	30,07± 0,82	,4	8,0	3,14	10,48	2 ,21	0 ,05
11	9	31,0±0 ,85	,6	1,6	1,00	3,22	0 ,77	0 ,0
12	2	38,45± 0,98	,0	3,0	7,45	19,33	4 ,50	0 ,001
13	6	42,0±0 ,90	,4	2,8	3,55	8,45	1 ,89	0 ,1
14		46,31±			4,31	9,3	2	0

	9	0,85	,6	2,0			,70	,01
15	8	51,0±3 ,8	,48	6,6	4,69	9,19	1 ,75	0 ,1
16	4	53,6±1 ,98	,14	3,7	2,00	3,72	0 ,60	0 ,0
16- 19	0	57,15± 0,61	,6	,1	4,09	7,15	2 ,34	0 ,02

The chest circumference at rest is one of the main anthropometric signs, which, in combination with growth, makes it possible to assess the physical development of those involved in its meaning is reduced to determining the shape of the body. The chest circumference characterizes not only the physique, but also the degree of physical development of a person. The characteristics of the indices of the chest circumference in the examined group of children and adolescents are shown in Table 3. The coefficients of variation (V) indicate a moderate individual characteristic, slightly increasing with age. The greatest coefficients of variation among adolescents 15-16 years old (V = 8.3%)

Intensive increase in chest circumference is uneven and increases markedly in boys 6-7 years old and 7-8 years old. In the puberty period, the absolute growth increases again, and at the age of 16-19 it is almost reduced to zero.

Table 3

OGK dynamics at rest in children and adolescents in mountains. Fergana from 6 to 19 years old

Age (years)		Standing height			Shifts of each subsequent group in comparison with the previous one			
		$M \pm m$	σ	V	Absolute growth (cm)	Growth rate (%)	t	p
6	0	55,79± 0,31	,4	,3	-	-	-	-
7		58,03±			2,25	3,86	1	0

Age	n	M±m						P
	4	0,35	,4	,1			1,8	,001
8	0	60,59±0,30	,2	,4	2,56	4,23	13,5	0 ,001
9	7	62,0±0,37	,2	,6	1,41	2,28	10,4	0 ,001
10	4	63,45±0,46	,0	,7	1,45	2,28	6,78	0 ,001
11	9	65,0±0,77	,27	,05	1,55	2,38	3,40	0 ,001
12	2	69,81±0,72	,0	,7	4,81	7,03	7,00	0 ,001
13	6	73,23±0,77	,6	,3	3,42	4,66	4,60	0 ,001
14	9	76,21±0,71	,8	,5	2,98	3,81	3,46	0 ,001
15	9	77,0±1,51	,40	,3	0,79	1,23	0,43	0 ,0
16	4	82,0±1,36	,03	,3	5,00	6,10	2,07	0 ,05
16-19	0	81,35±0,56	,4	,3	-	-	-	-

The absolute indicators of various signs of the physical development of children are calculated for each age period separately. A simple comparison of the sizes of the studied characters

shows that an increase in all indicators is characteristic of childhood and adolescence. However, the level of each indicator is influenced by many random causes, which are absolutely impossible to eliminate in a sample study. Therefore, the task is to determine the pattern of this increase, i.e. the tendency of the indicators to increase, which does not depend on the influence of temporarily and accidentally acting reasons.

In mathematical statistics, there are many ways to analyze dynamic performance. Theoretical calculations of the development trend, as a rule, are expressed by the line closest to the adaptation data (equation 1).

Empirical data are always subject to the influence of various random influences, which is reflected in a curve that looks like a broken line. Mathematical equations (modeling) make it possible to give the studied attribute a generalizing meaning, because for this the influence of random causes is eliminated. Such a method allows one to gain a deeper understanding of the manifest and establish its inherent regularities. An objective way to identify development trends is the least squares method. Comparing the direction of the empirical line of parameters of physical development by age with the theoretical, we did not find any discrepancy in the direction of the first empirical line in relation to the theoretical. The deviations are located either higher or lower. Such an arrangement of empirical lines should be considered as a random phenomenon, due, apparently, to an insufficient number of observations at each age.

Thus, the considered statistical characteristics of the main dimensional signs of the physical development of children and adolescents showed their significant age, sex differences and the dynamics of the indicators of these signs in children in the preschool and school period. A constant, but not uniform increase in these signs has been established. At the same time, the indicators of absolute growth cannot answer the question of which of the dimensional characteristics increases more intensively. Therefore, it is also necessary to analyze the growth rates - the percentage ratio between the absolute growth of the early period and the absolute indicator of the previous period (formula 2).

The results of the analysis of the rate of increase in the main anthropometric characteristics of children and adolescents in terms of standing height, body weight, and chest circumference are shown in tables 1, 2, 3. As an absolute increase, we took the quantitative changes in the trait for the year.

The rate of annual increases in the indicators of the main features is gradually decreasing. This trend is interrupted more intensively by the growth of all indicators of the main signs of physical development from 11 to 14 years old. Such phenomena are characterized by intensively proceeding morphological and functional processes in the body system.

In the puberty period, there is an intense growth and increase in muscles in boys and girls, which is explained by the anabolic effect of androgens. At the same time, androgens block the action of somatetropic hormone, under their influence, the re growth of the pineal glands is accelerated, which ultimately stops the linear growth of the body.

CONCLUSION

1. 1 The ratio of the growth rates of the main signs of physical development, calculated to the total increase for the period from 6 to 9 years, shows that boys showed a high rate of increase in body length; from the age of 9, a noticeable increase in the rate of increase in the circumference of the

chest compared with the rate of increase in body length was revealed.

2. From the age of 11, weight gain is more intense than gains in length and chest circumference.

3. The most intensive increase in the main signs of the physical development of children and adolescents in mountains. Fergana is observed in puberty (at the age of 11-12 years old, standing height 5.75%, body weight 13.33%, WGC at rest - 7.00%).

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