



FEATURES OF ANTHROPOMETRIC INDICATORS IN CHILDREN WITH DOWN SYNDROME

Abdullayeva M.E.

Department of Propaedeutics Children's Diseases and Polyclinic Pediatrics
Andijan State Medical Institute

✓ *Resume*

The development of a child with Down syndrome up to a year, his growth rate and weight gain are of great diagnostic importance and are the most important indicators of his somatic health. Thus, low body weight gain may be the first symptom of disorders of the cardiovascular, digestive or nervous system.

It is known that children with trisomy-21 are more likely to have congenital malformations. Moreover, the clinical manifestations of certain diseases in children with Down syndrome are often "erased" in nature, may occur under the guise of other conditions or are taken by clinicians for signs of the syndrome itself.

Keywords: Down syndrome, anthropometry, child's age.

ОСОБЕННОСТИ АНТРОПОМЕТРИЧЕСКИХ ПОКАЗАТЕЛЕЙ ПРИ СИНДРОМЕ ДАУНА У ДЕТЕЙ

Абдуллаева М.Э.

Андижанский государственнқй медицинский институт

✓ *Резюме*

Развитие ребенка с синдромом Дауна до года, его темп роста и прибавка массы имеют огромное диагностическое значение и являются важнейшими показателями его соматического здоровья. Так, низкая прибавка массы тела может оказаться первым симптомом нарушений со стороны сердечно-сосудистой, пищеварительной или нервной системы.

Известно, что у детей с трисомией-21 чаще встречаются врожденные аномалии развития. Более того, клинические проявления некоторых заболеваний у детей с синдромом Дауна часто носят «стертый» характер, могут протекать под маской других состояний или принимаются клиницистами за признаки самого синдрома.

Ключевые слова: синдром Дауна, антропометрия, детской возраст.

ДАУН СИНДРОМИ БЎЛГАН БОЛАЛАРДА АНТРОПОМЕТРИК КЎРСАТКИЧЛАРНИНГ ХУСУСИЯТЛАРИ

Абдуллаева М. Е.

Андижон давлат тиббиёт институти

✓ *Резюме*

Даун синдроми бўлган боланинг бир йилгача ривожланиши, унинг ўсиш суръати ва вазн ортиши катта диагностик аҳамиятга эга ва унинг соматик соғлигининг энг муҳим кўрсаткичлари ҳисобланади. Шундай қилиб, тана вазнининг пастлиги юрак-қон томир, овқат ҳазм қилиш ёки асаб тизимининг бузилишларининг биринчи аломати бўлиши мумкин.

Маълумки, трисомия-21 билан касалланган болаларда тугма нуқсонлар кўпроқ учрайди. Бундан ташқари, Даун синдроми бўлган болаларда баъзи касалликларнинг клиник кўринишлари кўпинча табиатда "ўчирилади", бошқа шароитлар ниқоби

остида пайдо бўлиши мумкин ёки клинисенлер томонидан синдромнинг ўзи белгилари учун қабул қилинади.

Калит сўзлар: Даун синдроми, антропометрия, болалик ёши.

Relevance

Currently, the main issue for people with disabilities is the realization of the lifestyle of normally developing people, and children with Down syndrome are no exception [4,9].

In recent years, much attention has been paid to the protection and development of children with special needs, which necessitates the creation of conditions for their integration into the system of modern social relations [2,6,10].

Undoubtedly, children with Down syndrome, as well as disabled children of other nosologies, experience enormous difficulties during entry into society. At the same time, it is known that team games successfully stimulate children to contact each other, solving the tasks of their socialization [5,7,11].

Down syndrome is the most common chromosomal pathology characterized by complete or partial trisomy of chromosome 21. Newborns with Down syndrome have an increased risk of congenital malformations. In addition, the clinical manifestations of some diseases in such children are often erased, may occur under the guise of other conditions or be mistaken by clinicians for signs of the syndrome itself [1,3,8].

Thus, the diagnosis of hypothyroidism and celiac disease in children with Down syndrome can cause serious difficulties [6,9]. Thus, the physical development of a child of the first year of life is one of the most important indicators of his somatic health.

It is known that children with Down syndrome generally have reduced growth rates from birth to the end of the entire growth period. The reason for this delay is not yet clearly clear. On the other hand, early prevention of paratrophy and overweight is of particular importance for children with Down syndrome [3,8].

It is possible to determine the growth rates of children by analyzing successive measurements of a child carried out at certain times, assessing the rate changes of individual indicators (length, body weight, head circumference). There are several main ways to evaluate anthropometric indicators, including parametric (sigma) and nonparametric methods.

The purpose of the study. To develop graphs for estimating the weight, body length and head circumference of children of the first year of life with Down syndrome living in the Ferghana region.

Materials and methods

The study group included 70 children born in 2019-2021 with cytogenetically verified Down syndrome who are being raised in a family. 27 girls and 43 boys were observed. Intrauterine development delay was observed in 18.7%, and morphofunctional immaturity in 19% of newborns.

At the age of 1 to 16 years, dynamic measurement of length, body weight and head circumference was carried out according to standard methods.

Result and discussion

The average weight of girls at birth was 3.132 ± 0.429 (M \pm d) kg (Table. 1), boys – $3,236 \pm 0.547$ kg (Table 2). Height – 50.13 ± 2.41 cm and 50.82 ± 2.73 cm, respectively. The average weight of girls with Down syndrome at 1 year was $8,275 \pm 1,06$ kg, and boys — $9,356 \pm 1,41$ kg. By 12 months of life, the average height of girls reached 72.29 ± 3.34 cm, and boys – 73.3 ± 3.89 cm.

The average value of the head circumference at birth in children with Down syndrome corresponded to the average value of the head circumference of ordinary children. For girls it is 33.53 ± 1.47 cm, for boys it is 34.04 ± 1.72 cm.

At the age of 12 months, the average head circumference of both girls and boys with Down syndrome was below the values of 1 standard deviation of the head circumference of ordinary children ($-1d$). Since a qualitative assessment of growth is possible only when analyzing the dynamic measurements of a child, we have proposed percentile graphs to assess the rate of changes in individual indicators (body length, body weight, head circumference), since they not only allow us to evaluate anthropometric indicators at the moment, but also give an idea of the growth rate of the child as a whole.

Table 1

Indicators of mass, body length and head circumference of girls with Down syndrome.

Age (months)		SD*	n**	body length (cm)	SD	n		SD	n
0	3,132	0,429	205	50,13	2,41	202	33,53	1,47	79
1	3,620	0,531	106	52,46	2,25	82	35,42	1,37	49
2	4,381	0,566	91	54,94	2,71	77	36,15	1,59	29
3	4,967	0,685	87	57,76	3,11	62	37,82	1,74	34
4	5,672	0,766	56	60,16	3,30	34	38,25	1,92	46
5	6,279	1,036	43	62,83	2,96	57	39,68	1,07	37
6	6,886	0,924	46	63,86	3,18	33	40,32	1,31	31
7	7,080	0,811	58	66,08	3,07	38	41,41	1,67	31
8	7,749	0,901	33	67,39	2,91	42	42,2	1,48	30
9	7,848	1,185	49	68,7	3,66	45	41,57	1,84	34
10	7,758	0,881	62	69,54	4,16	42	42,38	1,75	38
11	9,086	1,253	42	71,69	1,91	38	42,41	1,82	39
12	8,275	1,066	56	72,29	3,34	47	42,87	2,08	35

During the implementation of the project, at least 70 children diagnosed with Down syndrome (ICD-10: Q90) will be examined with the registration (and encryption) of personal data, anthropometric indicators (height, weight, body mass index), the presence of concomitant diseases (according to ICD-10).

Along with the formation of an observation group, a control group will be formed based on the compliance of the subjects by gender, age and body mass index, which will avoid the influence of third-party factors (differences in anthropometric data) on the elemental status. Also, using a sample (at least 70) of children with mental development disorders, a comparative analysis of patterns characteristic of Down syndrome and mental retardation will be conducted.

The analysis of the content of chemical elements in the hair will be carried out by inductively coupled plasma mass spectrometry on the NexION 300D device (PerkinElmer Inc., Shelton, Connecticut, USA).

Comparison of the main groups (Down syndrome, healthy children) will be carried out after data normalization by the method of single-factor analysis of variance (single-factor analysis of variance), while comparison of groups determined by several factors (Down syndrome (+/-) - obesity (+/-)) will be carried out using two-way analysis of variance.

Table 2

Indicators of mass, body length and head circumference of boys with Down syndrome

Age (months)	body weight(kg)	SD	n	body length (cm)	SD	n	head circumference (cm)	SD	n
0	3,236	0,547	232	50,82	2,73	220	34,04	1,72	100
1	3,723	0,744	150	52,83	2,45	110	35,83	1,59	42
2	4,586	0,729	107	56,13	2,7	49	37,67	1,45	34
3	5,371	1,062	97	59,44	2,78	79	38,74	1,31	39
4	6,154	0,762	63	62,33	2,80	42	40,09	1,23	29
5	6,701	0,968	52	63,24	4,4	40	40,93	1,78	22
6	7,139	1,123	62	65,56	2,3	42	42	1,57	44
7	7,687	1,22	43	67,86	3,15	41	42,26	1,46	33
8	8,219	1,179	43	69,71	3,35	47	43,6	2,43	25
9	8,365	1,146	46	68,11	3,16	37	42,92	1,44	33
10	8,557	1,434	38	70,23	3,21	33	43,25	1,5	35
11	9,044	1,682	52	73,67	1,53	33	43,55	1,52	36
12	9,356	1,414	55	73,3	3,89	36	43,85	1,66	47

The construction of correlation matrices in order to identify the interaction between chemical elements in the general population, as well as individual groups, will be carried out using the Spearman correlation coefficient.

Conclusion

The graphs proposed taking into account the results of this work for estimating the weight, body length and head circumference of children of the first year of life with Down syndrome living in the Fergana region can be successfully used in the practice of outpatient monitoring of such patients. This will improve the quality of diagnosis of concomitant pathology and will allow early prevention of nutritional disorders in children with trisomy of chromosome 21.

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