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ASSESSMENT OF VESTIBULAR DISORDERS WITH TYPE 1 DIABETES MELLITUS DURING THE STUDY

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Abstract:

The relevance of early diagnosis and determination of the risk of developing pronounced vestibular disorders is an equally important task, since in children and adolescents with type 1 diabetes mellitus it can have a great impact on the quality of life, further choice of profession and will help to avoid disability in children as the underlying disease progresses.

Keywords: vestibular disorders, diabetes mellitus, vestibular analyzer, stabilography

The relevance of early diagnosis and determination of the risk of developing pronounced vestibular disorders is an equally important task, since in children and adolescents with type 1 diabetes mellitus it can have a great impact on the quality of life, further choice of profession and will help to avoid disability in children as the underlying disease progresses.

Initially, no one in the groups of children with type 1 diabetes, selected in accordance with the designated criteria, at the time of hospitalization in the endocrinology department (the beginning of the study), had any complaints that would in any way be correlated with the variability of the patient's complaints with vestibular dysfunction.

A detailed analysis of anamnestic data obtained when working with parents of children with type 1 diabetes, in some cases, suggested periodic deterioration in the children's condition, lack of physical activity, malaise, etc. But these anamnestic data were not systemic in nature and could be associated with manifestations of the underlying disease - type 1 diabetes mellitus, as a result of which they were not taken into account in the study.

A comprehensive study of vestibular function in children with type 1 diabetes, which allows us to evaluate changes in the volume of selected tests, turned out to be uninformative due to the small percentage of initially obtained deviations (Table 1).

Table 1 - Results of a comprehensive study of vestibular function with type 1 diabetes in the process of corrective treatment of the underlying disease, abs. (%)

Researchedsigns and tests	patients with type 1 diabetes, identified according to the duration of the underlying disease								Total patients (n=226)	
	Group A (n=72)		Group B (n=50)		Group C (n=45)		Group D (n=59)			
	1 day	7-10 day	1 day	7-10 day	1 day	7-10 day	1 day	7-10 Day	1 day	7-10 day
Spontaneous nystagmus - "there is"	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (2.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.4%)	0 (0.0%)
Halmagi sample (saccades at turn)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Test "head-shaking" - positive – presence of Ny	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Hyperventilation onic test positive – presence of Ny	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (4.4%)	0 (0.0%)	2 (1.7%)	0 (0.0%)	4 (1.8%)	0 (0.0%)

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Romberg test (Availability deviations)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (2.2%)	0 (0.0%)	3 (5.1%)	0 (0.0%)	4 (1.8%)	0 (0.0%)
Try Unterberger-Fukuda(availability deviations)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Positional samples (availability)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Orthostatic sample(put linen)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Try Valsalva (positive)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Availability visual Saccade	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Post-rotator nystagmus (norm)	72 (100%)	72 (100%)	50 (100%)	50 (100%)	45 (100%)	45 (100%)	59 (100%)	59 (100%)	226 (100%)	226 (100%)
Caloric Nystagmus cold test: Norm	72 (100%)	72 (100%)	50 (100%)	50 (100%)	45 (100%)	45 (100%)	59 (100%)	59 (100%)	226 (100%)	226 (100%)

According to Table 1. One can clearly observe the absence of deviations in the main vestibular tests in the overwhelming majority of type 1 diabetes from all selected groups taking part in the study.

As is known, tests such as the "rotation test" and the "caloric test" allow one to properly assess the condition of the peripheral part of the vestibular analyzer. In our study, in the overwhelming sample size in all groups of type 1 diabetes, no deviations from the norm were obtained, which may be the basis for the conclusion that there are no disorders in the peripheral part of the vestibular analyzer. But this conclusion, in our opinion, cannot be accepted a priori, since the development of more specialized tests and/or adjustment of standards is likely required.

Considering the fact of the presence of vestibular function disorders in the overwhelming number of adults with diabetes mellitus of both types 1 and 2 [4], the data obtained in our study can be explained precisely by the physiological characteristics of the body, the more active physical activity inherent in this period, plasticity of the vascular and nervous systems, as well as the duration of disorders in the endocrine system. Probably, this direction requires further scientific study and development of options for studying vestibular function, taking into account physiological norms.

During the rotation test, vegetative disorders of grade 1 and 2 were recorded in 5 (2.2%) patients with diabetes mellitus. But such a small proportion of these patients did not allow statistical processing of the data obtained. In addition, in 2 patients (0.9%) the test values were within the normal range.

Thus, the presence of minor deviations in individual patients in the study did not allow us to count on the possibility of assessing vestibular disorders with type 1 diabetes mellitus using generally accepted samples and tests.

During preliminary vestibular testing, only an optokinetic test with visual stimulation revealed a decrease in the level of postural stability in children of all age groups with type 1 diabetes upon admission to the endocrinology hospital compared to the results of the control group.

In this regard, the main emphasis was placed on the interpretation of the main indicators of stabilometric studies in children and adolescents depending on the duration of type 1 diabetes.

Since the computer stabilography technique is the most adequate of those used to assess the balance function, studying the nature of changes in parameters in stabilographic tests makes it possible to identify the pathology of the balance organ and

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objectively characterize it even in people who do not complain of dizziness and imbalance.

This is of particular interest for sick children with initial manifestations of vestibulopathy against the background of diabetic polyneuropathy, as in the presented study, and makes it possible to carry out therapeutic and rehabilitation measures at the early stages to prevent the development of postural disorders. In addition, stabilometry as a method of objective assessment of the static and dynamic components of balance allows one to effectively assess the effectiveness of treatment (correction of glucose levels) and selection of the optimal dose of insulin in children and adolescents with type I diabetes mellitus.

But as was revealed in the previously described analyzes of a number of functional indicators, the duration of type 1 diabetes is of great importance in the formation of changes related to the auditory and vestibular analyzers. Tables 1-4 present the results of the analysis of the main indicators of the stabilometric study. Since the stabilometric study was carried out in the studied groups of children with type 1 diabetes in dynamics, respectively, with the relief of increased glycemia values, the third analyzed parameter was the indicators on the 7th day of hospital stay.

From the data in Table 1 it is clear that the length and area of the stabilogram, as well as the CFR (%) have statistically significant differences with the control group in all groups of type 1 diabetes. Moreover, these differences do not demonstrate gender differences and are observed among both men and women to an equal degree of severity.

But it should be noted that in patients with newly diagnosed type 1 diabetes in the age group from 10 to 17 years before treatment, the parameter "average position of the center of motion (CM)" in the frontal plane (abc) was on average displaced 14.4 mm from the sagittal axis.

As can be seen from Table 1, the deviation of the CoP in both the sagittal and frontal planes was x = 16.92 ± 1.002 mm, y = 13.7 ± 0.235 mm), the area of the statokinesiogram (S = 654.987 ± 9.342 mm²), the path of the CoP (L = 496.542 ± 22.432 mm) and the speed of movement of the CP (V = 16.214 ± 3.012 mm/s) were significantly increased compared to the control group.

From the results of this observation, it can be assumed that there are posturological abnormalities in children with type 1 diabetes even at the initial stage of development of the underlying disease. The study of these stabilography parameters for the observation period (7th day) did not demonstrate statistically pronounced dynamics.

Table 2 - Variability of stabilometric parameters in children and adolescents of group A (first diagnosed type 1 diabetes) in the study upon admission and on the 7th day of observation (relief of elevated glycemia values) in accordance with the selected age groups (n=75)

Characterristika			X, mm	U, mm	x, mm	y, mm	L,mm	S, sq. mm	mm/With	KFR,%	
										OG	ZG
Upon admission to hospital(1)	D	I	17.3±2.1	32.1±1.2	14.4±3.1	21.4±10.3	**392.2±34.2 ***	**562.7±21.2***	15.6±2.7	**59±3.2 ***	**35±2.6 ***
		II	16.1±4.2	29.3±0.6	16.3±1.7	13.2±4.0	**423.3±11.9 ***	**492.4±34.3***	14.2±3.6	**49±5.3 ***	**34±2.74 ***
		III	14.435±0.654	31.0092±6.45	16.92311,023	13.7±0.235	**496.542±22.432 ***	**654.987±9.342 ***	16.71±2.60	**69±5.67 ***	**42±3.51 ***
	M	I	21.4±7.21	31.341±6,21	15.913±5,2	19.231±2,4	**380.21±16.32 ***	**673, ±11.25 ***	16.21±3.01	**52±2.1 ***	**33±2.1 ***
		II	19.3±6.34	30.781±4,27	12.681±1,427	14.341±6,3	**392.91±17.21 ***	**561.43±18.457 ***	14.17±1.54	**46±3.3 ***	**36±0.1 ***
		III	13.567±1.3	30.431±3,427	10.463±2,401	10.521±5,3	**501.23±31.34 ***	**563.98±7.321***	14.61±2.06	**62±4.2 ***	**43±1.5 ***

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On the 7th day of hospital stay(2)	**D**	**I**	5.41±3.21	31.21±0.81	12.32±1.1	14.43±3.33	**352.32±24.51 ***	**362.77±11.32 ***	12.721±0,3	**94±0.3 ***	**76±1.21 ***
		II	6.431±2.1	28.81±0.46	9.69±1.48	12.24±2.08	**367.03±11.92 ***	**302.43±54.32 ***	12.32±0.87	**91±2.1 ***	**88±3.7 ***
		III	**3.543±0.26**	27.5523±2.65	**8.6343±0,452**	14.321±0,43	**363.56±11.975***	**232.56±57.65 ***	11.32±0.34	**89±2.8 ***	**89±0.5 ***
	M	**I**	3.455±2.21	30.451±2,12	9.13±3.2	15.51±2.09	**320.21±62.32 ***	**343, ±31.25 ***	12.31±0.31	**91±1.2 ***	**78±4.5 ***
		II	5.346±0.42	28.9±0.915	7.72±1.91	13.04±4.3	**342.16±27.21 ***	**261.47±11.47 ***	12.71±0.56	**90±0.1 ***	**84±1.3 ***
		III	**6.542±0.24**	28.439±2,92	7.931±0.891	10.521±5,3	**451.23±41.34 ***	**263.98±17.6***	11.14±0.54	**94±0.2 ***	**87±1.7 ***
Healthy children (k)	**D**	**I**	3.9±7.3	32.12±17,76	4.85±2.31	13.3±0.93	346.31±45.61	250.43±184.6	12.34±3.32	89.6 ± 0.6	82.7± 4.4
		II	2.5±8.8	30.07±19,81	5.32±0.31	14.1±0.4	401.34±78.21	220.51±96.9	11.34±4.02	89.2 ± 1.9	86.7± 3.2
		III	1.1±9.2	29.9±23.8	6.23±0.72	12.21±0.9	453.17±128.23	199.2±32.54	10.32±3.7	92.6 ± 0.9	96.1± 3.6
	M	**I**	4.2±7.8	33.12±21,31	5±1.03	14.9±5.56	321±60.187	190.34±145.36	12.65±4.32	89.3 ± 1.3	81.8± 2.8
		II	2.9±9.01	31.38±22,56	5.21±0.45	13.3±1.71	386.73±54.91	160.43±102.9	11.53±5.21	90.9 ± 0.6	84.7± 3.21
		III	1.5±8.9	30.35±19,15	5.8±1.53	12.3±0.31	462.01±101.33	194.45±22.1	10.56±3.76	91.3± 2.9	91.9± 1.2
Note*: $\chi^2$1.2=9.24 (p≤0.05);); $\chi^2$1,κ=9.77 (p≤0.05); $\chi^2$2,κ=3.01 (p≥0.05)											

Table 3 - Variability of stabilometric indicators in group B (duration of type 1 diabetes up to 5 years) in the study upon admission and on the 7th day of observation (relief of elevated glycemic values) in accordance with the selected age groups

Characteristics			**X, mm**	**U, mm**	**x, mm**	**y, mm**	**L,mm**	**S, sq. mm**	**V,mm/s**	**KFR,%**	
										OG	**ZG**
Upon admission to hospital	**D**	**I**	16.3±3,1	31.75±2.96	15.32±2.18	15.31±0.3	**443.52±31.26 ***	**502.34±11.39***	17.43±1,76	**69±8.2 ***	**49±3.8 ***
		II	14.3±3,43	30,987±2.902	14.83±4.2	14.37±0.093	**454.37±34.21 ***	**440.43±24.322 ***	16.81±2,609	**55±3.8 ***	**39±3.5 ***
		III	9.875±0.354	30,567±0.654	14.81±4.1	14.76±0.72	**534.549±28.432***	**464.47±21.82***	15.24±3.72	**86±4.5 ***	**58±4.2 ***

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	M	**I**	18.4±5,21	31,554±1.521	13.94±6.12	15.82±0.73	**466.52±39.215 ***	**512.37±10.32***	16.91±1,66	**60±2.2 ***	**44±3.6 ***
		II	19.3±65.35	30,533±1.023	14.903±5.43	14.32±1.03	**498.552±38.254***	**452.73±26.38***	15.87±6,32	**62±1.1 ***	**38±3.3 ***
		III	14.67±2.3	29.57±1.626	13.76±3.2	14.91±0.233	**541.56±30.47 ***	**503.08±17.81***	16.01±4,06	**75±4.1 ***	**56±2.2 ***
On the 7th day of hospital stay	**D**	**I**	7.11±4,21	31.21±0.81	10.32±1.52	12.321±0.43	**343.76±11.75 ***	**352.87±19.76***	12.64±0,874	**86±4.32 ***	**84±2.1 ***
		II	5.31±1,23	23,809±8.46	9,633±0.852	12.521±5.3	**323.55±12.97 ***	**303.08±17.6***	13.354±1.04	**77±5.1 ***	**64±5.4 ***
		III	6.543±0.187*	27.03±3.81	7.43±0.424 *	11.761±3.6	**433.57±20.41 ***	**312.56±40.23***	10.34±1,05	**92±0.5 ***	**82±3.7 ***
	M	**I**	13.5±4,21	28.14±4.12	8.43±0.452	12.981±4.3	**371.56±12.07 5 ***	**392.77±13.31***	13.54±0,345	**84±2.8 ***	**70±3.7 ***
		II	13.6±1,65	29.51±3.12	8,094±1.23	11.25±3.3	**360.56±10.85 ***	**372.17±15.92***	12.83±01.37	**86±3.2 *1**	**±1.4 ***
		III	**6.42±2,74**	25.53±3.15	7,331±0.547	11.024±2.3	**379.54±22.41 ***	**253.658±13.6***	11.65±0,91	**89±1.1 *0**	**±2.6 ***
Healthy children	**D**	**I**	3.9±7.3	32.12±17.76	4.85±2.31	13.3±0.93	346.31±45.61	250.43±184.6	12.34±3,32	89.6 ± 0.6	82.7± 4.4
		II	2.5±8.8	30.07±19.81	5.32±0.31	14.1±0.4	401.34±78.21	220.51±96.9	11.34±4,02	89.2 ± 1.9	86.7± 3.2
		III	1.1±9.2	29.9±23.8	6.23±0.72	12.21±0.9	453.17±128.23	199.2±32.54	10.32±3,7	92.6 ± 0.9	96.1± 3.6
	M	**I**	4.2±7.8	33.12±21.31	5±1.03	14.9±5.56	321±60.187	190.34±145.36	12.65±4,32	89.3 ± 1.3	81.8±2.8
		II	2.9±9.01	31.38±22.56	5.21±0.45	13.3±1.71	386.73±54.91	160.43±102.9	11.53±5,21	90.9 ± 0.6	84.7± 3.21
		III	1.5±8.9	30.35±19.15	5.8±1.53	12.3±0.31	462.01±101.33	194.45±22.1	10.56±3,76	91.3± 2.9	91.9± 1.2

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Note*: $\chi^2 1.2=8.62$ ($p\leq 0.05$);); $\chi^2 1,\kappa=9.17$ ($p\leq 0.05$); $\chi^2 2,\kappa=3.52$ ($p\geq 0.05$)

In accordance with the data in Table 2, a similar conclusion can be made about statistically significant differences in the length and area of the stabilogram and CFR (%) among children of all age groups during the study. There were also no gender differences.

We obtained similar data when analyzing the variability of stabilometric parameters with type 1 diabetes with a longer history of the underlying disease (Table 3).

Table 3 - Variability of stabilometric parameters in children and adolescents of group C (duration of type 1 diabetes 5-10 years) in the study upon admission and on the 7th day of observation (relief of elevated glycemic values) in accordance with the selected age groups

Characteristics			X, mm	U, mm	x, mm	y, mm	L,mm	S, sq. mm	V,mm/s	KFR,%	
										OG	ZG
At post uple	D	I	13.61±0.341	29.06±3,088	13.933±1.022	14.207±1.36	**406.54±30.492***	**432.451±11.32***	14.325±4.43	**76±2.1***	**47±5.32***
		II	11.67±0.916	29,126±2.79	14.271±1.432	13.017±1.23	**436.442±21.328***	**454.951±10.521***	14.011±3.93	**82±3.1***	**64±5.4***
		III	10,881±3.488	28.26±2.19	10.232±2.22	12.104±0.661	**457.145±43.243***	**491.179±8.992***	13.13±2,843	**90±0.8***	**74±3.6***
	M	I	11,431±0.22	28.93±5.831	14.292±1.092	13.923±1.88	**396.092±29.232***	**444.81±9.892***	14.81±3.49	**78±1.2***	**49±3.3***
		II	10.97±0.767	29.19±1.021	14.026±1.666	13.257±1.24	**406.524±12.432***	**464.165±7.32***	14.31±3,543	**76±0.3***	**62±0.45***
		III	9.543±0.981	27,989±1.45	12.255±1.114	12.123±2.354	**451.913±41.499***	**499.944±14.727***	13.817±2,032	**88±1.6***	**76±1.4***
On the 7th day of hospital stay	D	I	6.5±8.921	26,763±1.44	7,212±0.092*	14.014±0.321	**387.56±20.401***	**414.511±16.15***	12.324±0.413	**84±2.6***	**61±4.4***
		II	7.65±8,743	24,533±3.9706	7.81±0.981*	14.091±0.401	**413.560±19.4eleven***	**424.221±21.22***	12.437±0,131	**88±2.4***	**78±3.6***
		III	6.03±0.216*	24,673±2.094	6,640±1.51	14.12±0.21	**402.116±39.493***	**440.914±30.05***	11.224±0,298	**93±1.1***	**80±2.2***

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					3*						
	M	**I**	8.5±5.932	26,093±2.981	7.91±0.532*	14.09±0.93	**376.56±27.912***	**404.771±23.32***	12.46±0,31	**86±0.7***	**63±10.1***
		II	6.554±7,967	25,575±1.554	7.21±0.583*	14.811±0.303	**381.508±22.296***	**421.092±26.523***	12.112±0,199	**86±1.8***	**69±3.3***
		III	7.534±5,954	24,443±1.915	7.09±0.912*	13.121±0.509	**413.522±22.422***	**464.132±6.223***	11.947±0,121	**91±1.5***	**88±0.6***
Healthy children	**D**	**I**	3.9±7.3	32.12±17.76	4.85±2.31	13.3±0.93	346.31±45.61	250.43±184.6	12.34±3,32	89.6 ± 0.6	82.7± 4.4
		II	2.5±8.8	30.07±19.81	5.32±0.31	14.1±0.4	401.34±78.21	220.51±96.9	11.34±4,02	89.2 ± 1.9	86.7± 3.2
		III	1.1±9.2	29.9±23.8	6.23±0.72	12.21±0.9	453.17±128.23	199.2±32.54	10.32±3,7	92.6 ± 0.9	96.1± 3.6
	M	**I**	4.2±7.8	33.12±21.31	5±1.03	14.9±5.56	321±60.187	190.34±145.36	12.65±4,32	89.3 ± 1.3	81.8±2.8
		II	2.9±9.01	31.38±22.56	5.21±0.45	13.3±1.71	386.73±54.91	160.43±102.9	11.53±5,21	90.9 ± 0.6	84.7± 3.21
		III	1.5±8.9	30.35±19.15	5.8±1.53	12.3±0.31	462.01±101.33	194.45±22.1	10.56±3,76	91.3± 2.9	91.9± 1.2
Note*: $\chi^2$1.2=7.69 (p≤0.05);); $\chi^2$1,к=8.02 (p≤0.05); $\chi^2$2,к=4.01 (p≥0.05)											

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The statokinesigram indicators in the selected groups of children and adolescents with duration of type 1 diabetes according to Table 3 demonstrated both differences in the control group in the main indicators and a more stable result, regardless of age and gender differences.

Since with the duration of type 1 diabetes exceeding a 10-year history, Table 4 does not contain a group of children under 5 years of age. However, the trend defined in the previously given tables can also be traced in the statistical assessment of the main parameters of the statokinesiogram.

Table 4. Variability of stabilometric parameters in group D (duration of type 1 diabetes more than 10 years) in the study upon admission and on the 7th day of observation (relief of elevated glycemic values) in accordance with the selected groups

Characteristics			X, mm	U, mm	x, mm	y, mm	L,mm	S, sq. mm	V,mm/s	KFR,%	
										OG	ZG
Upon admission to hospital	D	II	11.39±8.2	31,231±1.421	14.04±1.34	11.231±1.198	**441.23±13.72***	**524.217±16.42***	12.91±2,83	**69±1.2***	**53±3.1***
		III	11,991±6.254	29.84±1.95	10.31±1.65	11.091±1.81	**401.2±11.91***	**574.217±6.99***	13.25±1,04	**68±0.7***	**54±2.1***
	M	II	12.03±5.6	30,972±2.08	13.39±1.09	12.28±1.22	**440.2±9.794***	**556.867±8.46***	13.256±2.861	**66±1.7***	**50±2.2***
		III	11.57±7.4	28.26±1.657	10.31±1.34 43	11.21±1.821	**399.683±23.725***	**577.297±4.498***	11.91±2,61	**68±2.2***	**53±2.1***
7th day of stayin hospital	D	II	6.76±1,09	27.85±2,411	8.12±0.139	12.832±0.902	**423.52±14.47***	**502.614±34.072***	10.62±0,66	**73±2.1***	**66±0.5***
		III	5.943±1.732*	27,554±1.618	8,329±0.1326	12.21±0.593	**373.11±11.117***	**532.637±30.175***	10.325±0.295	**75±1.8***	**64±0.8***
	M	II	4.19±8,01	27,091±1.784	8.125±0.135	12.331±0.533	**423.51±15.261***	**512.622±42.87***	10.925±0,254	**71±1.7***	**62±3.6***
		III	6.2±3.23	27.67±0.345	8.92±0.102	12.828±0.991	**383.56±13.27***	**542.542±38.279***	10.02±0,545	**74±0.4***	**67±0.8***
Healthy childre n	D	I	3.9±7.3	32.12±	4.85±	13.3±0.93	346.31±45.61	250.43±184.6	12.34±3,	89.6 ± 0.6	82.7± 4.4

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				17.76	2.31				32		
		II	2.5±8.8	30.07±19.81	5.32±0.31	14.1±0.4	401.34±78.21	220.51±96.9	11.34±4,02	89.2 ± 1.9	86.7±3.2
		III	1.1±9.2	29.9±23.8	6.23±0.72	12.21±0.9	453.17±128.23	199.2±32.54	10.32±3,7	92.6 ± 0.9	96.1±3.6
	M	**I**	4.2±7.8	33.12±21.31	5±1.03	14.9±5.56	321±60.187	190.34±145.36	12.65±4,32	89.3 ± 1.3	81.8±2.8
		II	2.9±9.01	31.38±22.56	5.21±0.45	13.3±1.71	386.73±54.91	160.43±102.9	11.53±5,21	90.9 ± 0.6	84.7±3.21
		III	1.5±8.9	30.35±19.15	5.8±1.53	12.3±0.31	462.01±101.33	194.45±22.1	10.56±3,76	91.3± 2.9	91.9±1.2
Note*: $\chi^2$1.2=7.28 (p≤0.05);); $\chi^2$1,к=7.7 (p≤0.05); $\chi^2$2,к=6.04 (p≤0.05)											

Thus, when conducting a stabilometric study in children and adolescents with type 1 diabetes, the following conclusions were highlighted:

- the statokinesiogram can have a very complex trajectory, but the presence of computer processing included in the research methodology makes it possible to evaluate differences in the main indicators in children and adolescents with type 1 diabetes, regardless of the timing of the underlying disease, age and gender characteristics;
- the presence of statistically significant differences in the interpretation of the main indicators of the statokinesiogram occurs in all selected groups of patients with type 1 diabetes from the control group;
- the area of the statokinesiogram, its length and CFR (%) are the main indicators characterizing vestibular function disorders in the studied category of patients;
- a duration of 7 days does not allow us to evaluate dynamic changes in statokinesiogram parameters and does not correlate with changes in glycemic levels, even with its normalization.

LITERATURE:

1. Ametov A.S. Diabetic peripheral polyneuropathy: pathophysiology, clinical manifestations, principles of treatment // Ametov A.S. Selected lectures on endocrinology. – M.: Medical Information Agency, 2011. – L. 4. – P. 58-90.
2. Drozdova E.A. Epidemiology of diabetes mellitus and the main directions for improving diabetes care for the population at the regional level (using the example of the Amur region): Abstract of thesis. dis. ...cand. honey. Sciences: 14.00.33. – 2007. – P. 24.
3. Zakharov V.V., Voznesenskaya T.G. Neuropsychiatric disorders: diagnostic tests. — M.: Medpress-Inform, 2013
4. O.S. Fedorova, I.A. Strokov, I.V. Guryeva, L.T. Akhmedzhanova, L.V. Kokhnenko. The role of polyneuropathy in imbalance in diabetes mellitus. Neurological Journal, No. 1, 2013
5. Usachev V.I. Spatial sense, vestibular apparatus and statokinetic system // Materials of the XV All-Russian. Congress of Otorhinolaryngologists. – St. Petersburg, 1995. – T. 1. – P. 49–54.
6. M.T. Nasretdinova.Changes in stabilometric parameters in patients with systemic vertigoOtorhinolaryngology. Eastern Europe 9 (2), 135-139 pp.
7. Sh.E. Omonov, M.T. Nasretdinova, F.A. NurmukhamedovOptimization
8. methods for determining ear noise in various pathologies. Herald
9. Kazakh National Medical University, 2014. 67-68 pages
10. MTNasretdinova, HEKarabaev, IASharafovaApplication of
11. methodologies of diagnostics for patients with dizziness.ь Central Asian
12. Journal of Medical and Natural Science 1 (1), 2020. 29-33
13. M.T.Nasretdinova, H.E.KarabaevPathogenetic aspects of ear
14. noise and its features in various ear diseases.

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-28, November 2023
ISSN: 2749-3644

15. Experimental and clinical otorhinolaryngology, 2020.67-69
16. M.T.Nasretdinova, Kh.E.Karabaev, I.A. SharafovaApplication of methods
17. diagnosis in patients with dizziness. Otorhinolaryngology.
18. Eastern Europe 8 (4), 2018. 390-396
19. Brach JS, Talkowski JB, Strotmeyer ES, Newman AB Diabetes mellitus and gait dysfunction: possible explanatory factors // Phys. ther. - 2008. - Vol. 88, N 11. - P. 1365—1374
20. Centomo H., Termoz N., Savoie S., Béliveau L., Prince F. Postural control following a self-initiated reaching task in type 2 diabetic patients and age-matched controls // Gait & Posture. - 2007. - Vol. 25. - P. 509-514.
21. Li J., Zhang T., Shen J. et al. The changes in vestibular function in patients with diabetes mellitus and its clinical signifi cance // Lin Chung Er Bi Yan Hou Tou Jing Wai Ke Za Zhi. - 2008. - Vol. 22, N 1. - P. 10-13.
22. Rigon R., Rossi AG, Cóser PL Otoneurologic findings in Type 1 Diabetes mellitus patients // Braz. J. Otorhinolaryngol. - 2007. - Vol. 73, N 1. - P. 100-105.
23. Toledo DR, Barela JA Sensory and motor differences between young and older adults: somatosensory contribution to postural control // Rev. Bras Fisioter. - 2010. - Vol. 14, N 3. - P. 267—275