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Features of the fetal alcohol syndrome manifestation in Republic Sakha (Yakutia)

58 children with fetal alcohol syndrome (FAS) from Republic Sakha (Yakutia) were detailed by means of 4-digit Diagnostic Code, routine and age-dependent developmental neurological assessment, brain ultrasonography, magnetic resonance imaging (MRI). In the various uluses of the RS (Y) the FAS rate varies from 0, 88 to 2, 10 per1000 live births, the fetal alcohol range disorders – from 0 up to 4, 86: 1000. Features of dysmorphic and structural cerebral abnormalities depending on ethnicity of the child are identified. Decrease of palpebral fissure length could be an early indicator of mental retardation

Keywords: fetal alcohol syndrome, ethnic features.

The aim of this investigation is to study ethnical features of fetal alcohol syndrome (FAS) in the Republic of Sakha (Yakutia, Russia).

Methods. Twenty-six Caucasian, 19 sakha and 13 native (even, evenks) babies in child hospitals and orphanages of 12 uluses (regions) and National Medical Center of Republic of Sakha (RS) with FAS aged from 40 postmenstrual weeks to 7 years were observed by means of 4-digit Diagnostic Code, routine and age-dependent developmental neurological assessment, brain ultrasonography, magnetic resonance imaging (MRI), Denver test and Zhurba Scale.

Results. Incidence of FAS varies from 0,06 to 0,9% in child population of different uluses, 0,3% in National Medical Center, and from 11.3 to 34.0% in orphanages.

Table 1.

The overall characteristics of observed children

Measures of variation	Caucasian			Sakha			Even/evenks		
	M	Me	Min-Max	M	Me	Min-Max	M	Me	Min-Max
Age, month	104.7	104.0	101-110	107.4	108.0	101-114	107.9	109.0	102-115
Gestational age.	35.8	37.0	27 – 40	37.2	38.0	28 – 41	35.9	36.0	30 – 40
Birth weight, g	2136	2060	900-3450	2140	2188	1120 – 2990	2099	2220	1350 - 2560
Birth height.	44.4	44.5	33.0-52.0	43.8	43.5	34.0 – 50.0	44.6	45.0	38.0 – 49.0
Weight at present	10518	9750	3600-19000	8125	7785	3000 - 18500	8527	8240	4200 - 14000
Height at present	84.8	85.0	52 – 108	70.1	71.0	56 – 112	75.5	69.0	56 - 108

Table 2.

Facial anomalies that are a key component of the diagnostic criteria for FAS

	Caucasian			Sakha			Even/evenks		
<i>Primary</i>	M	Me	Min- Max	M	Me	Min- Max	M	Me	Min- Max
Head circumference (centile)	4.4	3.0	3 – 10	6.4	3.0	3 – 25	3.5	3.0	3- 10
Palpebral fissures (mm)	18,8	19.0	15-22	15.6	16.0	14-25	16.7	16.5	12 – 20
Philtrum (score)	4.3	4.0	3 – 5	4.4	4.0	4 – 5	4.3	4.0	3 – 5
Upper lip (score)	4.2	4.0	3 – 5	4.0	4.0	3 -5	4.1	4.0	3 -5
<i>Additional</i>	Caucasian			Sakha			Even/evenk		
Low nasal bridge	16			17			11		
Low forehead	5			7			4		
Micrognathia	10			3			2		
Epicanthal folds	12			10			7		
Ptosis	9			5			4		
Short noses	6			9			5		
Minor ear anomalies	9			4			4		

Our investigation demonstrates that native babies with FAS were born pre-term more frequently than Sakha infants ($\chi^2 = 4.54$; $d = 0.033$). Sakha children with FAS have smaller birth weight and height than Caucasian ones ($\chi^2 = 4.35 - 5.90$; $d = 0.037 - 0.015$). Clinical assessment and neurovisualization show that Caucasian patients have ptosis and ventriculodilatation in significantly higher frequency than Sakha babies ($\chi^2 = 5.11 - 5.97$; $d = 0.024 - 0.015$); Sakha infants have muscle tone deviations, birth heart defects, visual nerve atrophy and subarachnoid space dilatation more often than other ones ($\chi^2 = 11.55 - 4.10$; $d = 0.0007 - 0.043$). Native children demonstrate better quality of social adaptation than Caucasian babies ($\chi^2 = 10.26 - 4.10$; $d = 0.0014$).

Spearman's correlation analysis achieved that quantity and frequency of the mothers drinking in

pregnancy correlate significantly with weight and height at present, smooth philtrum and micrognathia ($r = 0.28 - 0.33$; $p = 0.012 - 0.033$). The correlations are between age and social disadaptation ($r = -0.41$; $p = 0.007$).

Growth deficiency correlate with dysmorphology score (low nasal bridge, short noses, low forehead), malformation of locomotor system and congenital heart diseases ($r = 0.28 - 0.34$; $p = 0.01 - 0.37$).

The next high correlations are between decrease of palpebral fissure lengths and evidence of mental retardation ($r = 0.64$; $p = 0.001$).

There are the significant correlations between dysmorphology scores and defects in brain structure: between smooth philtrum and ventriculodilation; upper lip thinness and pachygyria; low forehead and subarachnoid space dilatation ($r = 0.35 - 0.4$; $p = 0.02 - 0.03$).

Magnetic resonance imaging studies have found the correlation between ventriculodilation with hearing disorders ($r = 0.59$; $p = 0.002$), anomalies of corpus callosum with hearing disorders and deformation of thorax ($r = 0.39 - 0.46$; $p = 0.002 - 0.05$).

We can do the following conclusions based on the previous research:

FAS and FASD among children in Republic of Sakha have specific difference in diagnostics depending from the institution and ethnical differences of places the research was made.

It's reliable that the diagnostics of FAS and FASD is much higher among native children.

There are the dysmorphical and structural cerebral disturbances depending from the nativity of child.

The multiple links revealed between anthropometrical, dysmorphical, structural cerebral parameters and the characteristics of clinical neurological status of disease. Particularly, the short palpebral fissures could be the early sign of mental retardation.

Our investigation shows the necessity of taking into account ethnical and regional features of FAS manifestation in epidemiological and clinical study.

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