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THE HEALTH STATUS OF ADOLESCENTS WITH THE PUBERTAL PERIOD HYPOTHALAMIC SYNDROME

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SUMMARY: 74 healthy adolescents and 142 patients with the pubertal period hypothalamic syndrome were examined. The indexes of protein, lipid and carbohydrate metabolic processes, hormone state, psychological peculiarities, quality of life, physical development peculiarities and reproductive function formation were investigated. Detected clinical and laboratory changes represent the early debut of the metabolic syndrome (MS) in the adolescents with hypothalamic syndrome (HS). The polymorphism of metabolic and endocrine disorders in the adolescents with HS reflects the high risk of early atherosclerosis and diabetes mellitus type 2 developments, progression of poly-endocrine pathology, resulting in reproductive disabilities.

Key words: adolescents, hypothalamic syndrome, health status, quality of life.

Pubertal period hypothalamic syndrome (HS) is the actual problem, depending variability of psychosomatic and neuroendocrine disturbances, influencing the quality of life, formation and prognosis of the adolescent's somatic and reproductive health. Actuality and social consideration of HS investigation were depended by the growth of such morbidity in children population, strong progression of the illness process, polymorphism of clinical manifestations and serious metabolic disorders [1, 2, 3, 4, 8, 9, 10]. For the last 5 years considerable growth of the HS patient's number was detected in Khabarovsk krai. The rate of this growth is much over than average for the whole Russia.

The aim of investigation: to examine the quality of life, health status, hormone status peculiarities in adolescents with HS in Khabarovsk krai.

Materials and methods.

142 adolescents with HS (78 girls and 64 boys) were examined. Physical and sexual development estimation [7], major indexes of protein, lipid and carbohydrate metabolism was investigated. Control group consists of 74 healthy adolescents with appropriate gender and age. Hormone state was detected by immune fluorescence analyze (IFA): insulin, luteinizing hormone (LH), follicular stimulating hormone (FSH), prolactin, TTH, T3, T4, ST4, estradiol, testosterone, cortizole, DHEA-acetate and C-peptide. Ultrasonic examination of the internal organs, gonads, endocrine glandules; complex neurophysiological examination (M-ECHO, reoencephalography, brain MRI) were made. Aiming to investigate personal psychological features in the adolescents with HS, psychological testing were provide with usage of Aizenk, Spilberg, Shmishek, Lusher tests. The quality of life was estimated by mean of standard questioner – SF-36 Ped. For statistical analyze Statistika 6.0 program was used. All the investigations were made in volunteers and anonymous, this permitted to get highly reliable results.

Results and discussion.

The prevalence of HS in girls was revealed (55%). The average age for the onset of the illness was $13,8 \pm 0,05$ years. The majority of the patients were urban citizens. This fact submits the role of emotional and physical stress, high living rhythm and unfavorable ecological situation in the pathology formation. Unfavorable family anamnesis had 73,9% of respondents: arterial hypertension and ischemic heart diseases – 16,9%; obesity – 15,5%; thyroid disorders – 12,9%; in 7% of cases relatives had diabetes mellitus type 2. Among the perinatal risk factors for HS formation were revealed: mainly, pathological pregnancy (64,8%); chronic fetus hypoxia (61,9%); fetus – placenta insufficiency (41,5%); the danger of spontaneous abortion (31,7%); anemic state (37,3%). In 23,9% the delivery were provided by Caesarian section. All the patient were under the neurologist control from the 1-st days of life because of perinatal encephalopathy with the further realization into residual encephalopathy in 45,8% of cases. Among the HS development risk factors were revealed: chronic inflammatory diseases of the oro-rhino-pharyngeal zone, such as chronic tonsillitis, adenoiditis, inflammatory of the additional nasal cavities (54,2%).

The quality of life estimation in patients with HS revealed: common health status is satisfy; physical activity, reflecting the level of physical load limiting, was high – 82%. Actual physical health, including subjective self-estimation of the pain syndrome intensiveness, physical working capacity and physical load endurance in HS patients were marked as low – 40,8%, while in healthy persons these indexes were 64,5% ($p < 0,005$). The adolescent's actual emotional functioning with such pathology in 1,75 times lower in comparison with healthy ones (36% and 63% correspondingly, ($p < 0,001$)). Every 3-rd respondent with HS suffers from constant psychological discomfort, has marked emotional instability, 33% of patients have decreased self-estimation, tendency for depression, moderate or severe anxiety level, disturbing normal functioning or any other every day activity (including increased time usage, decreased amount of work and it's depressed quality).

The considerable direct correlation of the neurophysiologic and psychological indexes with the anxiety and aggression, increasing under the pubertal hormone spurt, revealed ($r=0,6$).

Neurophysiological examination (EEG) revealed pathological deviation in the bioelectrical brain activity in 23,2% of patients. These changes predominate in girls and are characterized by paroxysmal epileptic activity in forms of primary generalized absence. In 64,5% of cases diffuse changes, reflecting functional reserve decompensation and immature brain structures were revealed: the absence of zonal bioelectrical activity distribution, weak cortex activity distribution and marked thalamic – cortical desynchronizes.

Reo-encephalography showed angio-hypotonic brain hemodynamic type: depressed magisterial vessels tonus, difficulties in vein drainage (72%), evidence of hyper tension –hydrocephalus syndrome (33, 8%). These facts explain the high frequency of the vegetative deregulation and cephalic pain syndrome (100%) and represent the main base for cognitive disorders in these patients (20, 4%).

Cardiac interval metric analyze revealed the predominance of hyper sympatic reactivity (64,8%), decreased level of heart rhythm management centralization, determined by unevenness and retardation of regulative mechanisms maturation. Physical development of the adolescents with HS is characterized by the predominance of macro somatic markedly disharmonious development (71,8%) with body mass index over 25 (56,3%) and over 30 (35,2%); the obesity of 3-rd stage detected in 6,3% of cases.

As for secondary sexual signs (SSS) in girls is concern, the high common index of sexual formula was detected as a result of intensive mammas growth – Ma ($12,21\pm1,2$ years), pubarche ($12,5\pm1,7$ years). In the structure of SSS formation disorders, the syndrome of incorrect pubertal period is prevailing and was detected in 5,6%: early adrenarche ($10,1\pm0,9$ years), hirsute syndrome (22,5%). It can be explained by laboratory submitted correspondingly functional hyperprolactinemia and hyperandrogenemia. The age of menarche appearance was $13,5\pm0,07$ years, the regular cycle established in a period of 1 year in 32% of cases. At the age of 17 years only 57,6% of girls with HS have stable menstrual cycle. The rate of menstrual cycle disorders increases at the age of 15-17 years: algomenorrhea diagnosed in 41,8% of cases, secondary amenorrhea in 6,3%. At the age of 16-17 oligomenorrhea registered more often (21,8%) and opsomenorrhea (34,6%). Fibrosis mastopathy revealed in 6% of cases. Menstrual function disturbances correlates with the obesity severity ($r=+0.5$), psychosomatic abnormalities ($r=+0.78$). Ultrasonic examination showed increased uterine size ($p<0.001$), ovaries ($p<0.001$), endometrium thickness, in 23% of cases multifollicular ovaries revealed. The SSS formation in boys accompanied by high frequency of prolonged gynecomastia up to the Ma 2, 3 (18,7%), hypogonadism (14%) and ginoid type of subcutaneous fat distribution.

In the structure of concomitant somatic pathology among the examined adolescents, the disorders of gastro intestinal tract (GIT) were revealed more often in boys vs girls (84,3% and 70,5% correspondingly) not only because of high spread of functional disorders (reflux; esophagus, stomach and intestine dyskinesia), but also because of liver fat dystrophy ($9,5\pm1,7\%$ in girls and $12,9\pm1,17\%$ in boys),

increased rate of chronic “adult” pathology: chronic gastroduodenitis, erosive gastritis, stomach and duodenum ulcers). Symptomatic arterial hypertension registered in every 3-rd boys. Intracranial hypertension was diagnosed reliably more often in boys vs girls ($38,0 \pm 4,12\%$ and $25 \pm 3,2\%$ correspondingly, $p < 0,05$). High correlation of HS and endocrine pathology was established: diffuse thyroid gland hyperplasia revealed in $26,9\%$ of girls and $34,3\%$ of boys; 26% of patients had pancreas reactive changes. Moderate insulin resistance ($4 < \text{HOMA-R} < 8$) revealed in detected in $22,5\%$ of patients. Lipid-grama examination showed low and moderate hypercholesteremia in $20,5\%$ of girls and in $32,8\%$ of boys; B-lipoprotein level was increased up to $62,0 \pm 4,8$ U/L in $20,5\%$ of girls and in $40,6\%$ of boys; triglycerides level up to $3,2 \pm 0,2$ nmol/ml ($p < 0,05$) in $33,3\%$ of girls and in 39% of boys; low density lipoproteins level up to $12,8\%$ of girls and $26,5\%$ of boys ($p < 0,001$).

In comparison with control group, the HS adolescents have reliably lower TTH level ($1,41 \pm 0,08$ and $1,56 \pm 0,08$ mIU/ml correspondingly) and considerable increased level of thyroxin active fraction – ST4 ($14,3 \pm 0,9$ and $12,4 \pm 0,2$ pmol/L correspondingly). Gender and age-dependent differences of the hypophysis-thyroid system functional activity were revealed. In girls, in comparison with control group, at the pre-pubertal period decreased level of TTH was established ($1,16 \pm 0,18$ and $2,0 \pm 0,3$ mIU/ml correspondingly, $P < 0,05$); at the pubertal period – decreased level of T3 ($1,9 \pm 0,09$ and $1,6 \pm 0,09$ mIU/ml correspondingly, $p < 0,05$). In the group of younger boys with HS no reliable differences in thyreotropic hormone content in comparison with control group was revealed; in the elder group, reliable decrease of blood T3 level ($1,72 \pm 0,1$ and $2,0 \pm 0,08$ nmol/L correspondingly, $p < 0,05$) and increased levels of T4 ($102,2 \pm 4,29$ and $89,4 \pm 2,7$ nmol/L correspondingly) and ST4 ($13,9 \pm 0,68$ and $12,1 \pm 0,41$ pmol/L correspondingly) were detected. These changes reflect the decreased processes of thyroxin deiodination under the situation of increased necessity in the active tryiodthronin. Relative sub clinical thyroid insufficiency was submitted by clinical status in the majority of teenagers with HS, which was characterized by increased rate of diffuse non toxic goiter of the 1-2 stages (WHO), structural thyroid gland changes – heterogeneity and decreased echogeneity, increased local blood flow.

The investigation of the pituitary gland gonad stimulating function revealed more early terms of the increased gonadotrophins secretion: high levels of the FSH and LH secretion in the young age group were established ($p < 0,005$, Fig. 1). Blood serum prolactin (PRL) level, does not exceeding referent norms, was 1,8 times over than the similar index in both gender groups of healthy adolescents ($p < 0,001$). PRL high concentrations aggravate vegetative dysregulation; contribute high frequency of psychosomatic disorders and menstrual function abnormalities. These symptoms widely spread in HS patients. Revealed changes show the serious tension of the adoptive homeostatic mechanisms in HS. It might be note, that in the gender groups of the HS adolescents, opposite PRL secretion direction revealed: there is a tendency to increased content of PRL in girls of pre-pubertal and pubertal periods, while in boys the tendency to decrease in PRL level was marked.

Sexual hormones (E_2) secretion in HS girls was reliably higher in comparison with healthy persons ($105,7 \pm 13,0$ and $68,2 \pm 7,6$ pg/ml correspondingly, $p < 0,03$). In boys, the tendency for testosterone level decrease ($13,9 \pm 2,0$ and $15,5 \pm 1,5$ nmol/L correspondingly, $p > 0,05$) and E_2 level increase ($50,6 \pm 6,4$ and $41,6 \pm 5,0$ pg/ml correspondingly) was revealed. This fact is explained by increased fat tissue aromatization in HS patients and can be used as a predictor for reproductive disorders in young males. The investigation of adrenal secretion in boys did not revealed any changes. But in the HS girls high levels of cortizole, testosterone and DHEA-s in comparison with healthy persons were detected ($p < 0,005$, Fig.2).

Reliable peculiarities of the somatotropin secretion were not detected; active growth acceleration in HS patients is provided, mostly, by synergic growth-stimulating effects of the thyroid, adrenal and sexual hormones.

In conclusion, detected clinical and laboratory changes show the early start of metabolic syndrome in the HS adolescents. Complete form (four and over metabolic syndrome markers) was diagnosed in 7,7% of cases, non-complete form in 67,6%. Clinical-metabolic variant of the metabolic syndrome is characterized by abdominal obesity (81,7%), cardiovascular (95,8%) and psychopathological (11,9%) disorders; mixed clinical features were revealed in 91,5% of cases. Among the all clinical cases metabolic syndrome had a stable type in 31,6%; progressive type in 27,4%; relapse type in 15,4%; regressive type in 25,6%. The polymorphism of the metabolic and endocrine disorders in adolescents with HS shows a high risk of the atherosclerosis early development, diabetes mellitus type-2 development, progressive poly endocrine pathology appearance.

All these changes contribute reproductive health disorders.

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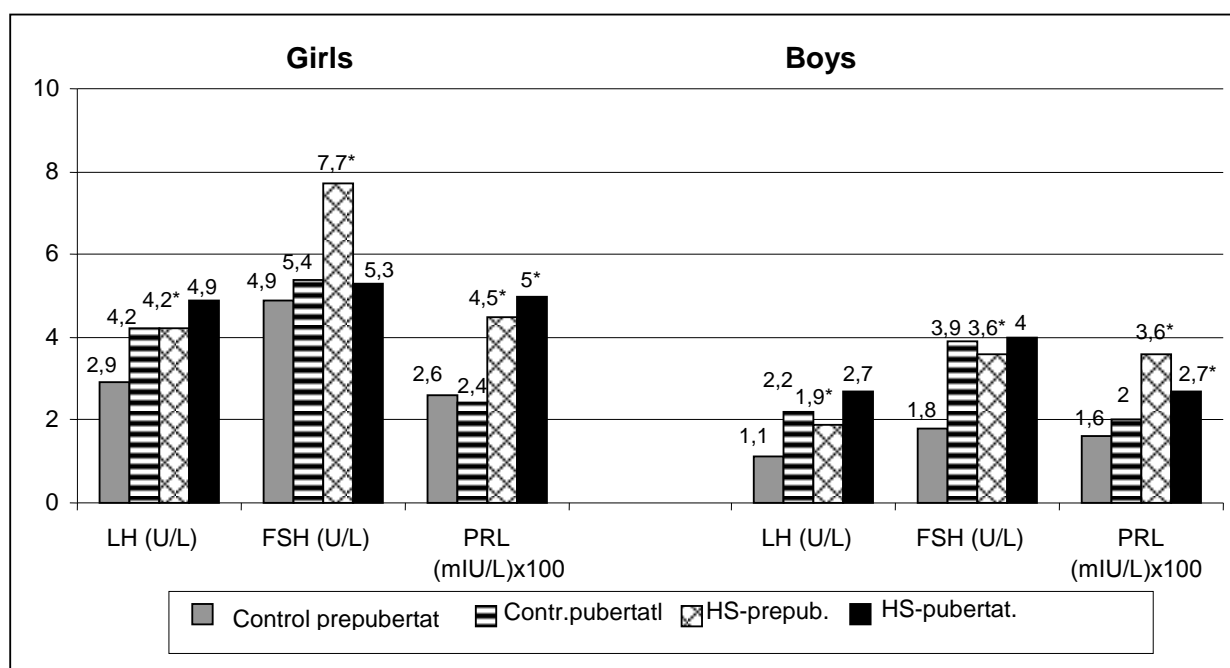


Fig.1 Gonadotropin and prolactin (PRL) levels in the HS adolescents in pre-pubertal and pubertal developmental periods

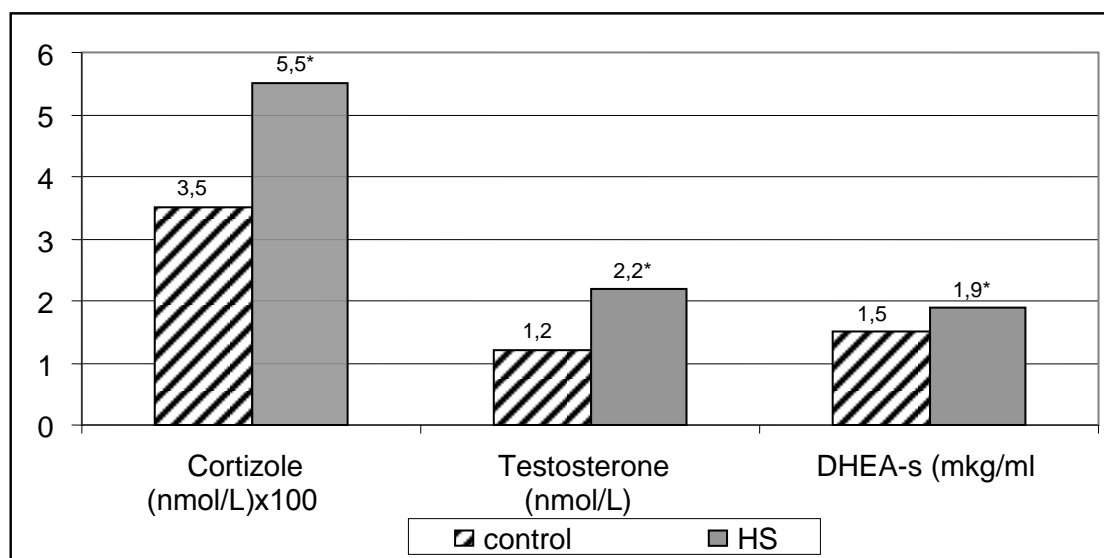


Fig.2 Glucocorticoids and androgens content in the adolescent girls blood serum

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IMMUNOLOGICAL INDICES OF PATIENTS WITH CHRONIC GASTRITIS ASSOCIATED WITH *HELICOBACTER PYLORI* IN YAKUTIA

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In research presents the immunological characteristics of patients with chronic gastritis. Survey participate 88 patients with chronic gastritis type B, indigenous (yakut), in age 30 to 50 years. In research the revealed dependence of the levels of immunoglobulins and cytokines on the degree of contamination *Helicobacter pylori* in the serum of patients with chronic gastritis.

Keywords: chronic gastritis, *Helicobacter pylori*, immunoglobulins, cytokines.

Introduction

In the Republic of Sakha (Yakutia), chronic gastritis (CG) is the most common disease in the structure of gastroenterological diseases [2,11]. According to the data of Goskomstat in Republic of Sakha (Yakutia) the diseases of the digestive system in the structure of general morbidity took third place (8.4%) in 2009. In 2008, the incidence reached 148.2 per 1,000 of population, while in Russia it is 112.7.