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ESTIMATION OF SYCHOPHYSIOLOGICAL STATUS OF STUDENTS ADAPTING IN THE SUB-ARCTIC REGION

ABSTRACT

The study was conducted on the basis of the Medical Institute NEFU. 44 volunteers from the university students between 18 and 23 years were the object of the study. All surveyed were male. We studied the features of psychophysiological state at forming adaptive reactions of the students M.K. Ammosov NEFU from countries with a hot climate (the main group). The control group consisted of students, representatives of indigenous ethnic groups (Yakuts, Evens). It was revealed that at adaptation to extreme subarctic climate in foreign students there are marked a shift in the balance towards the activation of the sympathetic part of the vegetative nervous system, moderate and high levels of personal anxiety, not accompanied by the perception of the majority of situations as threatening and the development of anxiety. On Harvard step-test graduation index in both groups there were no persons with the assessment of physical performance “excellent”. By indicators of heart rate variability in the main group the activity of stress-limiting systems dominated, whereas in the control – optimal adaptation indicators. It was found that the adaptive possibilities of the body of persons in the control group, estimated by the capacity of slow and fast waves, are characterized by low levels of mobilizing and reduction potential, in the main - a moderate level.

Keywords: psychophysiological status, population, adaptation, subarctic, region.

INTRODUCTION

The role of psychophysiological state in forming adaptive-adaptive reactions, and in the preservation of health allows expanding our knowledge of the mechanisms of regulation of adaptive processes in the conditions of emotional stress and exposure to stressful factors in extreme climatic conditions in Yakutia [3].

Objective: To evaluate the psychophysiological status of students in adapting to the subarctic region.

MATERIALS AND METHODS

The main group consisted of 14 people (Tajikistan - 8 Afghanistan - two, Kyrgyzstan - 3, Indonesia - 1), came from different regions. The second group (control) included 30 natives of indigenous nationality (Yakutsk, Evens) from different regions of the Republic of Sakha (Yakutia). All the examined were aged 17-19 years old. The survey was conducted due to ethics, with informed voluntary consent of the students to participate in the research. At the time of the research, all participants had no signs of any diseases and were considered relatively healthy.

The questionnaire of state anxiety (SA) and trait anxiety (TA) by C.D. Spielberger in adaptation of Y.L.Hanin (1976) was used to assess the mental and emotional condition of the person. As a functional test for the assessment of physical activity Harvard step test (HST), conducted by standard method (Dubrovsky V.I., 2002) was used [1, 5]. The indicators of respiratory rate (RR per minute), heart rate (HR, beats / min), systolic blood pressure (SBP, mmHg) and diastolic (DBP mmHg), pulse (PAD mm Hg .st.), mean dynamic (FBC mm Hg) at rest and after exercise were studied. Also Kerdo vegetative index (VIK, c.u) was used to assess vegetative tonus. Condition of the autonomic nervous system was determined on the basis of cardio-rhythm studies using diagnostic system “Valenta” (10 minutes record).

Statistical analysis of the material was performed by using IBM SPSS STATISTICS 22 package.

RESULTS AND DISCUSSION

The main and control groups were formed by anthropometric parameters, the main indicators of the cardiovascular system and respiratory rate were practically identical. At the same time, results in heart rate and FIV indicators suggested a displace of the representatives of the principal balance of the group towards the activation of the sympathetic part of the autonomic nervous system. Due to the fact that the cardiovascular system is an indicator of adaptive reactions of the whole organism [1], the detected changes can be regarded as a reflection of adaptation processes to the new climate and the learning process occurring in students from countries with the hot climate.

Some features of adaptive reactions taking place can be seen in the figures obtained state anxiety and trait anxiety among foreign students. If the groups did not differ in the level of state anxiety, the performance level of trait anxiety of the main group were significantly higher, not only compared to the control, but also with the available scientific data in the literature [8, 9]. This allows us to interpret the level of personal anxiety core group of students as high. When calculating the coefficients for indicators of state and trait anxiety by Spearman rank correlation (r) we‘ve got opposite results. May be it is possibly because of age-related psycho-emotional characteristics of the individuals. Students of the main group showed the moderate and high levels of trait anxiety, no one with the low levels. 35.7% of high level of trait anxiety among foreign students indicates the presence of their expression of emotional stress. However, they do not tend to take most of the situations as threatening and respond to the alarm condition. Results of the control group, the distribution of the first-year students by level of state anxiety and trait anxiety is different from the literature data, according to which most students have a domination of high- and moderate-anxiety (93.3%) and low- and moderate-anxiety (93.3%) respectively. At the same time the prevailing in the first case are high-anxiety (53.3%), in the second - low-anxiety (66.7%) first-year

students. [7] A limitation of this study is the small size of the main group.

The results of the research showed no statistically significant differences in the main indicators of the cardiovascular system at rest between the main and control groups, except for a high rate of heart rate in the group of foreign students. Some studies indicated the inertia of arterial pressure, which is associated with North people adaptability living in cold climatic conditions [3]. After physical exercises the main and control groups had statistically significant increase in heart rate indicators, SBP, DBP, FBC, VIK. PAD levels have not changed, the representatives of the main groups DBP values were significantly higher than in the control one, in other indicators, including IGST, no differences were found. From the data obtained, a more pronounced change in sympathicotonia values was observed in the control group. A number of the researches indicated that the activation of the tone of VNS values VIK exceed zero [4, 10]. From the values of VIK group were not significantly different, but the state of the autonomic nervous system tone at rest in the main group was evaluated as eutonia whereas in the control group - a preponderance of parasympathetic tone card.

In assessing the state of physical health on IGST in both groups there were no one with a rating "excellent". All the representatives of the control group the activity corresponded to the average or below average level. In the main - the similar estimation including students with bad and good physical condition.

The analysis of heart rate variability (AMO MI, BA, MB) showed that in the main group compared with the control had a statistically significant lower voltage value of the index, mode amplitude and higher power of fast and slow waves of the 2nd order. According to Baevsky's voltage index we can make a conclusion that [2, 3] that individuals in the main group with the position of physiological regulation had predomination the activity of stress-limiting systems and in the control group - optimum values of adaption.

High power of fast waves in the main group showed predominant influence of the parasympathetic part of the autonomic nervous system in the regulation of sinus rhythm. Adaptation capabilities of persons from the control group, estimated by the power of slow and fast waves were characterized by low levels of mobilizing and reduction potential. In the main group the same data correspond to the moderate level. A similar pattern is observed in relation to the power of slow waves of the 2nd order of values that reflect the activity of ergotropic and humoral-metabolic mechanisms of heart rate regulation, assessed as the moderate level of mobilizing potential.

The obtained results do not differ from those of other researches that the university students studying in extreme climatic conditions of the North have reduced adaptation mechanisms and functional system reserves [3, 6, 8]. A limitation of this study is the small size of the main group.

CONCLUSION

The peculiarities of psychophysiological state in forming adaptive reactions of organism, heart rate and VIK allow to suggest displace of the principal balance to the activation of the sympathetic part of the autonomic nervous system of the representatives of the main group. At the same time, the foreign students' high level of trait anxiety is not accompanied by the perception of the majority of situations as threatening and do not develop their anxiety. By graduation of GTS index in both groups, there was no one with the assessment of physical activity as "excellent". The activity of stress-limiting systems is dominated in assessing heart rate variability in the main group. Adaptive capacity of the organism in the control group estimated by the power of slow and fast waves were characterized by low levels of mobilizing and reduction potential, in the main group - the moderate level. It was found out that the relationship between psychological characteristics and environmental factors arising in the course of adaptation to extreme subarctic climate exists as to the successful adaptation influenced by subjective factors and environmental groups, including the physiological characteristics of a person.

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THE PRIMARY IMMUNODEFICIENCY IN PATIENT WITH BRONCHIAL ASTHMA

ABSTRACT
The article is devoted to an actual problem of primary immunodeficiencies. Primary immunodeficiencies are rare diseases, and awareness of this pathological condition is not enough. Itleads to late diagnosis and inadequate treatment of patients suffering from primary immunodeficiency. Allergic diseases often dominate clinical picture of immunodeficiency states. There is a case's descriptionof primary immunodeficiency in a child with asthma.

Keywords: bronchialasthma, primary immunodeficiency, clinical case.

INTRODUCTION

Primary immunodeficiency is the congenital disorder of the immune system associated with genetic defects in one or more host defense mechanisms, namely cellular and humoral immunity, phagocytosis, complement system. Despite the achievements in diagnostics, more than 70% of patients with immune deficiencies are not diagnosed, and their typical manifestations are severe bacterial, viral and fungal infections, autoimmune and allergic diseases. Primary immunodeficiency is diagnosed in children most times, commonly in early childhood [2].

We can identify common features characteristic of all primary immunodeficiency's forms despiteexpressed inhomogeneity of both clinical and immunological manifestations.

Primary immunodeficiency has a main feature – inadequate susceptibility to infections, while other manifestations of immunodeficiency are overfrequency of allergies and autoimmune manifestations, as well as propensity to neoplasia, which is relatively small and highly irregular.

Allergic manifestations occur in 17% of patients on average. Allergic diseases are obligated for Wiskott-Aldrich syndrome and hyper- IgE-syndrome and hurried in the selective deficiency (atopic dermatitis, bronchial asthma) – occurs in 40% with usual character of the course [3]. Observation is very important to understand the nature of allergic reactions. According to it, allergic diseases in the majority of primary immunodeficiency's more severe form absent together with the loss of ability to produce IgE and to develop a delayed type hypersensitivity reaction pseudoallergic (parallergic) reactions (toxicodermia,exanthema in drug and food intolerance) are possible for any form of immunodeficiency. Autoimmune diseases are diagnosed in 6% of patients, which is much higher than in normal pediatric population. However, their frequency is very irregular. The same goes for malignant diseases, which occur with overfrequency only in some forms of primary immunodeficiency [1, 4].

The aim of our study was demonstration of clinical case about primary immunodeficiency in a child with asthma.

MATERIALS AND METHODS

Clinical observation's data of primary immunodeficiency in a child with asthma.

RESULTS

Patient P., 6 years old, resident of Yakutsk, was repeatedly hospitalized in pediatric pulmonology department of the Republican hospital №1 with a diagnosis "bronchial asthma, atopic form, moderate-to-severe condition, uncontrolled; allergic rhinitis, persistent; atopic dermatitis; dysplasiaof connective tissue, undifferentiated".

From anamnesis we know that the child from a family with anamnesis record: mother - pollinosis, paternal grandfather – bronchial asthma, elder brother – pimary immunodeficiency, unspecified, bronchial asthma. Girl is from the second pregnancy that occurred with toxemia, threat of interruption, chronic pyelonephritis, from operative delivery at 35-36 weeks of pregnancy. Birth weight is 2995g, length is 49 cm, Apgar score - 8/8 points. Diagnosis in the first month: perinatal affection of CNS hypoxic genesis. Conjugationalhyperbilirubinemia. The child was breast-fed from birth until 4 months. BCG vaccination was in maternity hospital.

Allergic anamnesis: redness ofthe cheeks on fish, semolina, syrups.

Anamnesis of the disease: shortness of breath and rhythmic paroxysmal cough, recrudescing at night and during physical exertion, are marked from 4 months.The girl was repeatedly hospitalized and examined according to the place of residence.Also pains in stomach and legs, upregulation of AST in blood are periodically observed from an early age. Past medical history: frequent ARVI (10-12 times annually), bronchitis, chronic sinusitis, acute bilateral multisegmentalpneumonia (3 years).

In 2010, she was sent to the Institute of Medical Genetics in Tomsk, where cystic fibrosis was excluded.

In 2012, the diagnosis was found in the pulmonary department of the Republican hospital №1 for the first time: bronchial asthma, atopic form, mild disease; allergic rhinitis, persistent; atopic dermatitis; undifferentiated dysplasia of connective tissue; facial dysmorphia. Background therapy was assigned, strokes were observed once in every 2 months. According to computer assisted tomography, nothing abnormal was detected. Immunoassay: IgG 10,66 g/l, IgA 1,93 g/l, IgM 4,28 g/l, Ig E 8,3 g/l; immunophenotyping of lymphocytes CD3- 70 %, CD4 – 52, CD8 – 26, CD16 - 11, CD19 - 10, CD3/HLA – 8%, Immunoregulatory index - 2; ά1-antitrypsin - 271 mg/dL. In 2013,