

Criteria for assessing the functional state of the body using algorithms of electropunctural diagnostics among students engaged in extreme sports (snowmobile tourism)

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Introduction

The transition of universities to a new system of higher education revealed a number of organizational and normative problems in the physical development of students in connection with the orientation towards the foreign system of physical education, based on the independence of students in the choice of means and the volume of physical culture lessons. In connection with the growing popularity of extreme sports and tourism, among young people aged 16 to 25, it is important to study the functional state of the body on the basis of electropunctural diagnostics (EPD), mathematical modeling, psychophysiological determination of the quality and quantity of health. Of particular interest are EPD methods for assessing the level of health and the degree of normalizing effect on biologically active points (BAP) of the body of students, which can be implemented in the conditions of the Northern Urals, where it is quite difficult,

Materials and methods

WITHhelp EPD developed a system methods prevention maladjustment states in persons involved in extreme sports (EMU). The effectiveness of regular EMU classes for a student's ABO has been proven. Physiological observations of the choice of EMU, attractive for students, revealed a steady interest in snowmobile tourism (ST), working with a navigator, getting acquainted with technical means. To achieve the goal and solve the set tasks, we carried out research in 72 practically healthy students from the 1st to the 5th year of the Faculty of Physical Culture of PSGPU. When dividing students into groups, not only the results of educational activities, physical culture and sports (FKiS) were taken into account, but also the experience of EMU

- ST. The first group (main) consisted of 35 students involved in ST. The average age of the group members was 20.10 ± 0.38 years. Boys in the group - 25, girls - 10. The second group (comparison) - 22 students involved in physical culture and sports. The average age is 18.42 ± 0.21 years. Boys in the group - 12, girls - 10. The third group (control) (CG) consisted of 15 students who are not involved in physical culture and sports. The average age was 19.28 ± 0.33 years. Boys in the group - 8, girls - 7. All students, according to the curriculum, underwent a health-improving complex: Iyengar yoga, training in self-massage techniques and hardening with water. We used the following research methods: analysis of scientific and methodological literature; questionnaire survey; analysis of morbidity according to the data of registration of medical visits in

polyclinic institutions, forms No. 039 / U-02, No. 12, No. 57; anamnesis vitae, morbi; health assessment according to the integrative point scale for the quantitative assessment of the health level according to G.L. Apanasenko; FSMK assessment; VNS, (Kerdo index) and VR using orthoclinostatic test; functionality of the body's CVS (veloergometry (VEM) - Ketler ergometrAX1, type 07992-600); assessment of the mental state according to the blank method "SAN" V.A. Doskin, Ch.D. Spielberger, Yu.L. Khanina; prediction of the body's adaptive reserves on the basis of mathematical methods using bioinformation technologies - EFI BAT according to the method of R. Voll, ART "IMEDIS-TEST"; methods of mathematical statistics. The studies were carried out on the APK "IMEDIS-EXPERT" (registration No. FSR 2010/08232) and the apparatus "MINI-EXPERT-DT" (registration No. RZN 2014/1393),

Research results

During the study of the initial functional reserves of students' mental health, the mental state was assessed before and after snowmobile expeditions. Assessment of the level of indicators of functional reserves of the body of students living in the Perm region, according to the survey, the overwhelming majority (84.5%) showed changes in the FS of the body. Among the students of the 1st and 2nd groups (n = 57), complaints of drowsiness prevailed - 56.8%; students of the 3rd group (n = 15) more often complained of fatigue - 50%; drowsiness - 18.8%; bad mood - 11.6%; headaches - 10.1%; dizziness - 9.5%. The assessment of the level of anxiety throughout the academic year was carried out using a self-assessment scale (Ch.D. Spielberger, Yu.L. Khanin) to analyze the dynamics of the psychological state (PS) of students. In the course of the study of the level of reactive anxiety (RT) and personal (LT), it was found that five students (13.5%) of the 1st and 2nd groups (n = 37) had a high level of RT (54.72 ± 1.12 points); two students (5.4%) had a high level of radiation therapy (54.47 ± 1.84 points) HP. RT was 29.72 ± 2.15 points (low), RT - 40.55 ± 1.57 points (moderate). Ten students (66.6%) of the 3rd group (n = 15) had high RT (55.31 ± 1.24 points), five students (33.3%) had high RT ($52.44 \pm 1, 06$ points). Group indicator RT 24 points), five students (33.3%) had high RT (52.44 ± 1.06 points). Group indicator RT - 42.01 ± 1.42 points (moderate), RT - 44.63 ± 1.26 points (moderate), p - 0.05. Influence of snowmobile expeditions on ODF indicators among students of the first groups after returning from snowmobile expeditions (SE): complaints of fatigue, drowsiness and decreased working capacity by the end of the day were noted in 23.3% (84.5% before the expedition). The students of the second group and the group monitored the dynamics of RT and RT after SE with the following indicators: in the 1st group (n = 35), the RT level significantly decreased - from 33.06 ± 1.86 points (moderate) to 20.22 ± 1.12 points (low) and RT - From 42.44 ± 1.26 to 30.12 ± 1.46 points (moderate), p < 0.05. In group 2 students (n = 22), there was a decrease in RT level - from 40.15 ± 1.06 to 32.11 ± 1.03 points (moderate), RT - from 43.98 ± 1.54 to 40.83 ± 1.72 points (moderate), p - 0.05, one week after the session. The students of the 3rd group (n = 15) showed a tendency towards an increase in the RT level from 40.42 ± 0.98 points (moderate) to 44.22 ± 1.26 points (high). LT decreased from 43.16 ± 1.18 to $40.32 \pm 1,$

According to the data of the research of physical health (FZ) of students according to G.L. Apanasenkov of the 1st and 2nd groups, engaged in physical culture and sports ($n = 57$), the following was established: in 11 students (19.3%) OB was $- 19.22 \pm 0.16$ (high); 28 students (49.1%) were above average $- 15.54 \pm 0.23$; eight students (14.1%) had an average of 11.12 ± 0.33 ; in ten (17.5%) OB is below average $- 7.04 \pm 0.28$. The indicator of the FZ level of these groups was 14.13 ± 0.39 points (above the average), which corresponds to a safe level of health. In the control group of two students (13.3%) OB was 18.05 ± 0.98 (high); three students (20%) OB was above average $- 14.98 \pm 0.52$; seven students (46.7%) had average OB $- 12.46 \pm 0.62$; three students (20%) had OB below average $- 6.28 \pm 0.15$. The indicator of the FZ level in the group was 12.91 ± 0.43 points (average), which corresponds to the tension of adaptation mechanisms, $p < 0.05$.

The assessment of the functional capabilities of the cardiovascular system (OFVSSS) of students according to the data of bicycle ergometry was carried out using a Ketler ergometr AX1 bicycle ergometer (type 07992-600) in 55 students. The data obtained indicate a significant increase in the functional performance of the CVS in the group of students involved in snowmobile tourism (first group) in the field conditions of the SS. So in the first group ($n = 20$), the power of the threshold load (MPN) increased by 32.5%, 1345.3 ± 37.2 kgm / min., In comparison with the second group ($n = 20$) - 24.2% , which amounted to 1180.6 ± 47.2 kgm / min., $p < 0.05$. The students of the 1st group showed the most pronounced increase in the "double product" indicator (by 28%) and did not reveal a decrease in the efficiency of the left ventricle of the heart during physical activity (with a norm of 6.4 ± 0.3), which indicates an increase in the functional reserves of the myocardium. At the same time, among the students of the second group, the "double product" indicator increased by 6%, $p < 0.05$. The control group students showed an insignificant increase in MPN (by 9.1%), which amounted to 1034.4 ± 45.5 kgm / min., $P - 0.05$. The functional state of the ANS in students was assessed by the Kerdo vegetative index (VI) in the first minute of the orthoclinostatic test (A.M. Wayne et al., 1981). According to Wayne et al., 1981). According to Wayne et al., 1981). According to toclinostatic test, for students of the first group ($n = 35$), the HR indicators improved, which was reflected in a decrease in the number of persons with a predominance of the parasympathetic influence of HR from 54.3% ($n = 19$) to 25.7% ($n = 9$). HP decreased from 13.27 ± 1.15 to 6.64 ± 1.12 bpm. ($p < 0.05$), which testifies to the undoubted positive effect of snowmobile tourism (FTZ) on the students' ABO. According to the orthostatic test, in 18.2% of students ($n = 4$) of the second group ($n = 22$), the changes were not statistically significant. According to the clinostatic test, in 13.3% of students ($n = 2$) indicators were 14.12 ± 1.06 bpm. ($p - 0.05$). In students of the third group ($n = 15$), according to the orthostatic test, the indicators of the activity of the sympathetic link of the ANS changed from 16.61 ± 0.93 to 18.16 ± 1.22 ($p - 0.05$). According to the study of the state of the parasympathetic link of the ANS (clinostatic test), indicators increased from 11.28 ± 1.44 to 13.98 ± 1.42 ($p - 0.05$). At the same time, the predominance of parasympathetic influences in reactivity was determined in seven people, which amounted to 46.7%. Thus, the research data allow us to conclude that with the help of the FTZ in combination with the health-improving complex, the VNS FS normalizes and, consequently, the students' ABO increases.

Assessment of the mental load (PN) of students using EPD. Grademental load (PN) among students before and after the expedition on snowmobiles in the conditions of SS was carried out by us using the ART method "IMEDIS-TEST". When testing PN, the task was set - to compare the PN among students of FTZs, and those who are not involved in FTZs. The results of the PN study were assessed by eight grades - from I to VIII. Moreover, the VIII degree is the highest. In total, 72 students took part in the study, including 46 boys and 26 girls. The dynamics of mental load under the influence of FTD in seven students (20%) of the first group (n = 35), according to the ART "IMEDIS-TEST", there was a tendency to decrease in PN from 7.41 ± 0.16 to 5.33 ± 0.03 degrees, while the number of persons with high PN decreased from 40.0 to 20.0%, with $p < 0.05$. Three months later, during the re-examination, a high degree of PN (7.62 ± 0.24) was observed in eight students (22.8%), $p = 0.05$. In two students (22.2%) of the second group (n = 22), PN decreased from 7.26 ± 0.07 to 5.68 ± 0.12 degrees. At the same time, the number of persons with high PN decreased from 40.9% to 31.8%, $p > 0.05$. Three months later, a high degree of PN (7.22 ± 0.06) was tested in seven (31.8%) individuals, $p = 0.05$.

The dynamics of EFI BAT indicators under the influence of FTZ was positive. So, in 19 students (54.3%) of the first group, the results on the meridians improved: H_d - from 10.30 ± 2.10 to 36.38 ± 1.88 ; End - from 11.17 ± 1.05 to 37.71 ± 1.89 ; T - from 9.33 ± 2.12 to 34.29 ± 1.87 arb. i.e., $p < 0.05$. In 13 individuals (37.1%), there was a tendency to improve indicators, $p = 0.05$. In 14 students (63.6%) of the second group, $p < 0.05$. Six students (27.3%) also improved their indicators, but $p = 0.05$.

We have developed and introduced into practice criteria for assessing the functional state of the body using EPD algorithms. Revealed:

1) a drying out level (D), which means a breakdown of adaptation mechanisms. It is characterized by low AVO, which requires examination by specialists; low level (B), characterized by overstrain of the body. The parameters indicate a decrease in the functional capabilities of the body. A rehabilitation program is required, because this is a risk group;

2) the average level (B), corresponding to the "borderline state". It is characterized by a reduced RF of the main body systems, by the stability of neurodynamic processes. It is necessary to streamline the regime of work and rest, to differentiate the FN. A correction program is required;

3) high (stable level) (A), characterized by high reserves adaptation (RA) of the main body systems.

Conclusions:

1. Application of methods of prevention of maladjustment states based on of the ART method "IMEDIS-TEST" in combination with a health complex promotes an increase in AVO with the most pronounced effect among students engaged in snowmobile tourism. A statistically significant decrease in the RT level was found from 33.06 ± 1.86 points (moderate) to 20.22 ± 1.12 points (low) and RT - from 42.44 ± 1.26 to 30.12 ± 1.46 points (moderate), $p < 0.05$; normalization

VR indicators in the clinostatic test - 13.27 ± 1.15 to 6.64 ± 1.12 bpm, $p < 0.05$; an increase in the functional efficiency of the CVS (an increase in the MPN by 30.5% and an increase in the indicators of the double product by 28%), $p < 0.05$; decrease in PN from 7.41 ± 0.16 to 5.33 ± 0.03 degrees; an increase in the electrical conductivity of the CTU on average by 12.64 ± 1.12 c.u.; a decrease in complaints about a feeling of fatigue, drowsiness in working capacity: before the expedition, 84.5% of students, - after - 23.3%) an increase in the level of FZ according to G.L. Apanasenko from 14.13 ± 0.39 (above average) to 17.22 ± 0.46 points (high).

2. Developed using EPD algorithms based on clinical and of experimental data, the criteria for assessing the functional state of the body made it possible to identify the levels of students' health: drying out (D), low (C), medium (B), high (stable) (A).

3. Decrease in ABO among students during the one-year cycle of study due to a high degree of PN (7.29 ± 0.12) in 41.7% of students, and low electrical conductivity of the CTE on the meridians involved in the regulation of immunological homeostasis in 86.1% of individuals, hyperactivity of the parasympathetic division of the ANS (in 54.1%), average and below average level of physical health (according to G.L. Apanasenko) (38.8%).

4. The scale for assessing the level of health based on the test system of mathematical methods, taking into account the level of tension of the psychophysiological load of students during the academic year, allows (according to objective conditional points) to distribute students according to the level of health: from 0 to 5 points - high adaptive capabilities of the organism; from 6 to 10 - medium; from 11 to 17 - low; - 18 and above - drying up adaptive possibilities - and, if necessary, carry out corrective procedures.

5. There was a decrease in the incidence (33.3%) and duration of diseases (26.8%), ($p = 0.05$) It was found that each student in the observation groups missed an average of 6.9 days due to illness in the first year of study, while in the second academic year, students who started snowmobiling, admissions decreased by 2.04 times and amounted to 3.4 days.

Literature

1. Pat. 41447. Transport sleigh / A.B. Sharov, L.V. Sharova. - No. 2004117423; Appl. 10.06.2004; Publ. 27.10.2004.

2. Pat. 76027. Snowmobile vehicle for people with disabilities opportunities / PGPU, A.V. Sharov, L.V. Sharova. - No 2009501312; Appl. 05/18/2009; Publ. September 16, 2010.

3. Sharova, LV, Kravtsov, YI Bio-resonant therapy in neurological rehabilitation of patients with cervical osteochondrosis // 6th congress of the European federation of neurological societies. - Vienna, Austria. - P. 56.

4. Sharova. L., Belokrylov N., Kravtsov Y. Bioinformation technologies in the complex assessment and correction of cerebral hemodynamic impairments in judo-fighters with cervical dorsopathy. Lase Journal of Sport Science. Vol. 4, 2013. - No. 1. - P.41-54, Riga. [p-ISSN: 1691-7669; e-ISSN: 1691-9912 (ISO 3297)<http://journal.lspa.lv>].

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