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THE DEVICE FOR ELECTROSTIMULATION "VEB-1" MODULATES PARAMETERS OF ELECTROENCEPHALOGRAM AND GAS DISCHARGE VISUALIZATION

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МОДУЛЮВАННЯ ПАРАМЕТРІВ ЕЛЕКТРОЕНЦЕФАЛОГРАМИ І ВІЗУАЛІЗАЦІЇ ГАЗОВОГО РАЗРЯДА ЗА ДОПОМОГОЮ ЕЛЕКТРОСТИМУЛЯТОРА "ВЕБ-1"

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МОДУЛИРОВАНИЕ ПАРАМЕТРОВ ЭЛЕКТРОЭНЦЕФАЛОГРАММЫ И ВИЗУАЛИЗАЦИИ ГАЗОВОГО РАЗРЯДА С ПОМОЩЬЮ ЭЛЕКТРОСТИМУЛЯТОРА "ВЭБ-1"

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Summary/Резюме

Background. We created and patented device for electrostimulation "VEB-1". It is intended for activation of functional systems of organism by wave influence on nerve plexus by frequency beats method. This article launches a series of articles on the influence of this device on the parameters of the neuroendocrine-immune complex and the metabolism of various categories of people. *Materials and Methods.* The object of observation were 14 males aged 24-59 years without clinical diagnose but with dysfunction of neuro-endocrine-immune complex and metabolism. In the basal conditions we recorded electroencephalogram (EEG) a hardware-software complex "NeuroCom Standard" (KhAI Medica, Kharkiv, Ukraine) as well as the Kirlianogram by the method of gas discharge visualization (GDV) with the use the device "GDV Chamber" ("Biotechprogress", SPb, RF). Then the volunteers were subjected to an electrostimulation session lasted for 21 minutes in four days. One day after the last session, the EEG and GDV was re-registered. *Results*. 20 parameters of EEG were identified, in which the volunteers' neurodynamics before and after the course of electrostimulation differed considerably. The neurotropic stimulation effect has a modulating character, namely: the initially decreased spectral power density (SPD) of the alpha-rhythm in F3, F4, T4, T5 loci as well as of theta-rhythm in P3 locus increases; decreased SPD of beta-rhythm in the F3, C3, C4, P3, P4 and O2 loci as well as Amplitude of beta-rhythm becomes even smaller; the initially increased SPD of delta-rhythm in the loci Fp1, F8 and P4 rises further. Among the GDVs parameters we found that the electrostimulation course increases the reduced area of GDI to the lower normal zone. However, the initial asymmetry of the GDI (f) becomes even more pronounced.

Changes in the symmetry of virtual chakras are also found. *Conclusion***.** A four-day electrostimulation course causes on males with dysfunction of the neuro-endocrine-immune complex and metabolism a notable neuro-modulating effect evaluated by changes in basal EEG. This is accompanied by changes to a number of GDV parameters.

Keywords. *Device for electrostimulation, frequency beats method, electroencephalogram, gas discharge visualization.*

Вступ. Ми створили і запатентували пристрій для електростимуляції “ВЕБ-1”, призначений для активації функціональних систем організму хвильовим впливом на нервове сплетення методом частотних ударів. Ця стаття запускає серію статей про вплив цього пристрою на параметри нейроендокринно-імунного комплексу, а також на метаболізм різних категорій людей. *Матеріали та методи*. Об’єктом спостереження були 14 чоловіків у віці 24-59 років без клінічного діагнозу, але з дисфункцією нейроендокринно-імунного комплексу та метаболізму. У базових умовах нами були записані електроенцефалограма (ЕЕГ) за допомогою апаратно-програмного комплексу «НейроКом Стандарт» («ХАІ Медика», Харків, Україна), а також так звана кірліанограмма, отримана методом газорозрядної візуалізації (ГРВ) з використанням приладу «ГРВ Камера» («Биотехпрогресс», СПб, РФ). Потім добровольці піддавалися електростимуляції протягом чотирьох днів, кожен сеанс тривав 21 хвилину. Через день після останнього сеансу ЕЕГ і ГРВ були перереєстровані. *Результати*. Було ідентифіковано 20 параметрів ЕЕГ, при яких нейродинамика добровольців до і після курсу електростимуляції істотно відрізнялася. Ефект нейротропної стимуляції має модулюючий характер, а саме: спочатку знижується спектральна щільність потужності (SPD) альфа-ритму в локусах F3, F4, T4, T5, а також збільшується тета-ритм в локусі P3; зниження SPD бета-ритму в локусах F3, C3, C4, P3, P4 і O2, а також амплітуда бета-ритму стає ще менше; спочатку збільшений SPD дельта-ритм в локусах Fp1, F8 і P4 збільшується далі. Серед параметрів ГРВ ми виявили, що курс електростимуляції збільшує зменшену площу GDI до нижньої нормальної зони. Однак початкова асиметрія GDI (f) стає ще більш вираженою. Крім того, було виявлено зміну симетрії віртуальних чакр. *Висновок*. Чотириденний курс електростимуляції викликає у чоловіків з дисфункцією нейроендокринно-імунного комплексу та метаболізму помітний нейромодулюючий ефект, оцінений по змінам базальної ЕЕГ. Це супроводжується змінами ряду параметрів ГРВ.

Ключові слова. *Пристрій для електростимуляції, метод частотних ударів, електроенцефалограма, газорозрядна візуалізація.*

Введение. Мы создали и запатентовали устройство для электростимуляции “ВЭБ-1”, предназначенное для активации функциональных систем организма волновым воздействием на нервное сплетение методом частотных ударов. Эта статья запускает серию статей о влиянии этого устройства на параметры нейроэндокринно-иммунного комплекса, а также на метаболизм различных категорий людей. *Материалы и методы.* Объектом наблюдения были 14 мужчин в возрасте 24-59 лет без клинического диагноза, но с дисфункцией нейроэндокринно-иммунного комплекса и метаболизма. В базовых условиях нами были записаны электроэнцефалограмма (ЭЭГ) при помощи аппаратно-программного комплекса «НейроКом Стандарт» («ХАИ Медика», Харьков, Украина), а также так называемая Кирлианограмма, полученная методом газоразрядной визуализации (ГРВ) с использованием прибора «ГРВ Камера» («Биотехпрогресс», СПб, РФ). Затем добровольцы подвергались электростимуляции в течение четырех дней, каждый сеанс длился 21 минуту. Через день после последнего сеанса ЭЭГ и ГРВ были перерегистрированы. *Результаты*. Было идентифицировано 20 параметров ЭЭГ, при которых нейродинамика добровольцев до и после курса электростимуляции значительно различалась. Эффект нейротропной стимуляции имеет модулирующий характер, а именно: первоначально снижается спектральная плотность мощности (SPD) альфа-ритма в локусах F3, F4, T4, T5, а также увеличивается тета-ритм в локусе P3; снижение SPD бета-ритма в локусах F3, C3, C4, P3, P4 и O2, а также амплитуда бета-ритма становится еще меньше; первоначально увеличенный SPD дельта-ритма в локусах Fp1, F8 и P4 увеличивается далее. Среди параметров ГРВ мы обнаружили, что курс электростимуляции увеличивает уменьшенную площадь GDI до нижней нормальной зоны. Однако начальная асимметрия GDI (f) становится еще более выраженной. Кроме того, было обнаружено изменение симметрии виртуальных чакр. *Заключение*. Четырехдневный курс электростимуляции вызывает у мужчин с дисфункцией нейроэндокринно-иммунного комплекса и метаболизма заметный нейромодулирующий эффект, оцениваемый по изменениям базальной ЭЭГ. Это сопровождается изменениями ряда параметров ГРВ.

Ключевые слова. *Устройство для электростимуляции, метод частотных ударов, электроэнцефалограмма, газоразрядная визуализация.*

Introduction

We created device for electrostimulation “VEB-1”. It is intended for activation of functional systems of organism by wave influence on nerve plexus by frequency beats method. The generator is assembled on the basis of the patent of Ukraine for utility model 105875 “Portable device for electrotherapy and stimulation” [1]. Its operation is described in [2].

Material and research methods

The object of observation were 14 males aged 24-59 years (including three authors) without clinical diagnose but with dysfunction of neuro-endocrine-immune complex and metabolism, characteristic for premorbid (intermediate between health and illness) state.

In the morning on an empty stomach we recorded electroencephalogram during 25 sec a hardware-software complex “NeuroCom Standard” (KhAI Medica, Kharkiv, Ukraine) monopolar in 16 loci (Fp1, Fp2, F3, F4, F7, F8, C3, C4, T3, T4, P3, P4, T5, T6, O1, O2) by 10-20 international system, with the reference electrodes A and Ref on tassels the ears. Among the options considered the average EEG amplitude (мV), average frequency (Hz), frequency deviation (Hz), index (%), coefficient of asymmetry (%), absolute (мV^2/Hz) and relative (%) spectral power density (SPD) of basic rhythms: в (35ч13 Hz), б (13ч8 Hz), и (8ч4 Hz) and д (4ч0,5 Hz) in all loci, according to the instructions of the device.

In 1996 KG Korotkov created a new scientific approach, based on the digital videotechnics, modern electronics and computer processing quantitative data, called as method gas discharge visualization (GDV bioelectrography). Parallel uses the terms Kirlianography and Electrophotonics. Method of GDV, essence of which consists in registration of photoelectronic emission of skin, induced by high-frequency electromagnetic impulses, allows to estimate integrated psycho-somatic state of organism. The first base parameter of GDV is area of gas discharge image (GDI) in Right, Frontal and Left projections registered both with and without polyethylene filter (f). The second base parameter is a coefficient of shape (ratio of square of length of external contour of GDI toward his area), which characterizes the measure of serration/fractality of external contour. The third base parameter of GDI is entropy, id est measure of chaos. Program estimates also Energy and Asymmetry of virtual Chakras. It is considered that parameters of GDV, taken off without filter, characterizes the current psychophysiological condition of organism while registered with a filter characterizes vegetative regulation at the level of stable physiological processes [3,4]. Since ambiguous attitude to the method (between excellent and fickle), previously we conducted the study on its verification and have shown that GDV parameters are correlated with HRV, EEG and endocrine parameters as well as can change with variation in other functional parameters of the body [5-10].

The Kirlianogram have been registered by the method of GDV with the use the device “GDV Chamber” (“Biotech-progress”, SPb, RF).

Then the volunteers were subjected to an electrostimulation session lasted for 21 minutes in four days. One day after the last session metabolic testes was re-registered.

Results processed using the software package “Statistica 5.5”.

Results and Discussion

A fragment of the results was published earlier [11].

For the purpose of adequate comparative assessment changes in data EEG they are transformed into normalized parameter Z, calculated by formula:

$Z = (V/N - 1)/Cv$; where V is individual value of variable; N is its mean of normal (reference) value; Cv is coefficient of variation (SD/N) in norm.

By the results of the screening of the Z values of the EEG parameters, we identified a series of patterns. The first pattern reflects an increase in the initially lower levels of SPD alpha- and theta-rhythms. While moderately decreased SPD levels of beta-rhythm as well its Amplitude becomes even smaller. To this pattern we also included an increase in the Asymmetry of the theta-rhythm. The third pattern includes SPD of delta-rhythm, which initially were on the upper limit of the norm or were moderately elevated, and under the influence of electrical stimulation significantly increased, in particular in locus F8 drastically. The last pattern included parameters of the EEG, whose initial normal levels, judging by the mean values, did not significantly change under the influence of electrostimulation. The reason for taking them to consideration will be discussed later.

And now we suggest looking at Fig. 1, which shows integrated patterns. The first pattern displays a normalizing increase in the low-

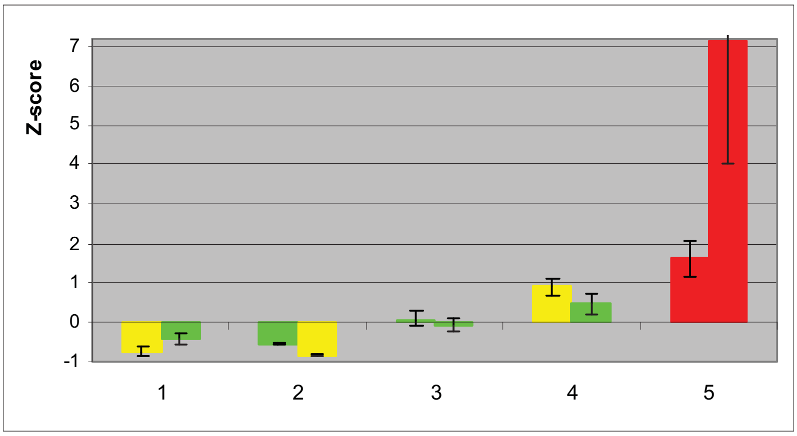

Fig. 1. Integrated patterns of electrostimulation effects on EEG

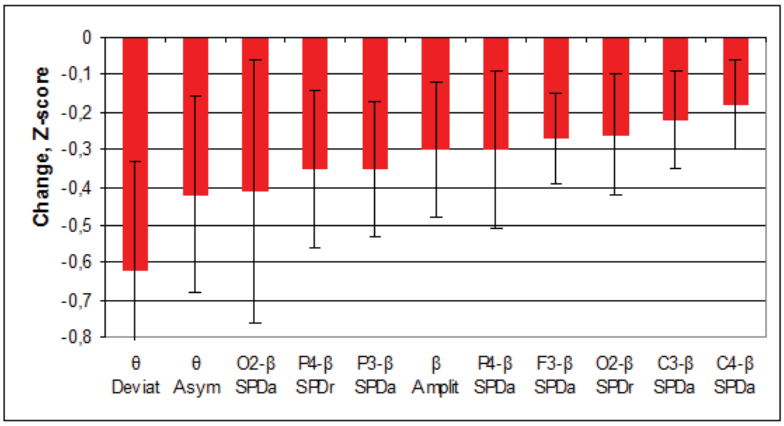

Fig. 2. Ranking of inhibiting neurotropic effects of electrostimulation

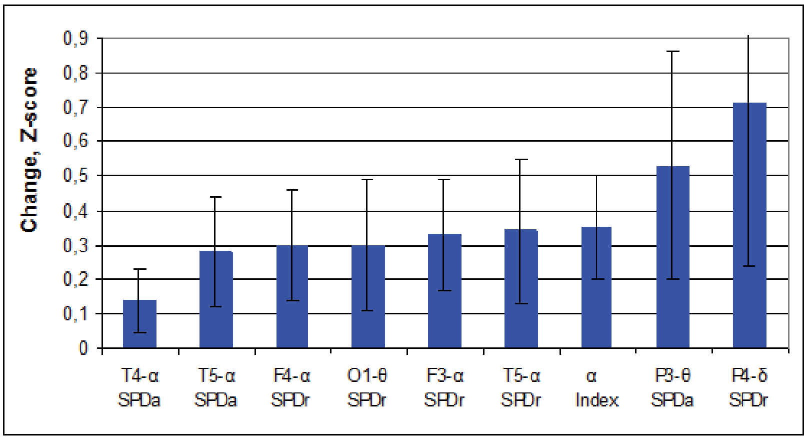

Fig. 3. Ranking of enhancing neurotropic effects of electrostimulation.

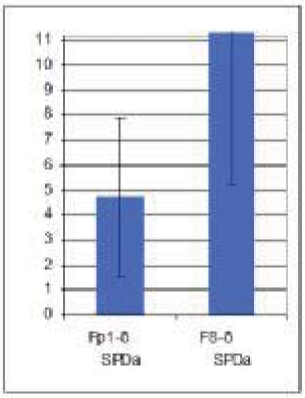

Fig. 4. Drastically enhancing neurotropic effects of electrostimulation

ered parameters. Instead, the second pattern reflects the further decrease of the initially lower parameters. The third pattern visualizes the irregularity of the initially normal parameters. The fourth pattern reflects the normalizing decline of the initially elevated SPD of beta-rhythm in locus O2. The fifth pattern demonstrates the further increase of the initially elevated parameters.

As we see, only the first, third and fourth patterns correspond to the classical JF Wilder's "law of the initial level". However, going ahead, we note that the second and fifth patterns also reflect physiologically favorable changes in the EEG.

If we calculate the changes of the considered parameters of EEG by the method of direct differences, then they are significant for all, including initially normal (Fig. 2-4).

Based on the results of discriminant analysis [12] by the method of forward stepwise the model included 20 parameters of EEG (Table 1).

Information about the parameters is condensed in the canonical discriminant root, which correlates with some of them **positively**, and with others **negatively** (Table 2). The same table shows the Raw Coefficients and Constant for discriminant variables, based on which as well as on the individual values of the parameters of the EEG, the individual values of the canonical root before and after electrostimulation course were calculated (Fig. 5).

As you can see, electrostimulation makes a tangible neurotropic effect in all volunteers without exception.

Among the GDV registered parameters, we restrict ourselves to those that were included in the discriminant model as well as those that were out of the model but changed statistically significantly (Table 3).

It has been found that the electro-

Table 1

Discriminant Function Analysis Summary for parameters of EEG
Step 20, N of vars in model: 20; Grouping: 2 grps. Wilks' Λ: 0,020; approx. $F_{(21)}$ = 16,7; $p < 10^{-3}$

Variables currently in the model	Reference level (*n* = 88)	Initial level (*n* = 14)	Final level (*n* = 14)	Change after 4 Seanses	Wilks' Λ	Partial Λ	F-remove	p-level	Tolerancy
θ-rhythm Deviation, Hz	1,06 ± 0,07 0	1,21 ± 0,18 +0,22 ± 0,26	0,79 ± 0,11 -0,40 ± 0,17	-0,43 ± 0,20 -0,62 ± 0,29	,134	,153	38,8	10^{-4}	,072
F3-β SPD, μV^2/Hz	89 ± 5 0	59 ± 7 -0,61 ± 0,15	45 ± 4 -0,88 ± 0,08	-13 ± 6 -0,27 ± 0,12	,052	,391	10,9	,013	,088
β-rhythm Amplitude, μV	13,6 ± 0,5 0	11,6 ± 0,7 -0,48 ± 0,17	10,3 ± 0,5 -0,79 ± 0,12	-1,3 ± 0,8 -0,30 ± 0,18	,107	,191	29,6	,001	,017
O2-β SPD, μV^2/Hz	117 ± 8 0	97 ± 20 -0,27 ± 0,28	66 ± 9 -0,69 ± 0,12	-31 ± 19 -0,42 ± 0,26	,147	,140	43,1	10^{-4}	,011
δ-rhythm Asymmetry, %	33 ± 3 0	57 ± 6 +0,90 ± 0,21	46 ± 7 +0,48 ± 0,26	-11 ± 9 -0,41 ± 0,35	,178	,115	54,0	10^{-4}	,033
C3-β SPD, μV^2/Hz	96 ± 5 0	62 ± 8 -0,70 ± 0,16	51 ± 4 -0,92 ± 0,08	-11 ± 6 -0,22 ± 0,13	,035	,581	5,0	,060	,066
P4-β SPD, %	25,5 ± 1,8 0	24 ± 4 -0,11 ± 0,23	18 ± 3 -0,46 ± 0,19	-5,8 ± 3,5 -0,35 ± 0,21	,026	,791	1,9	,215	,089
P4-β SPD, μV^2/Hz	90 ± 4 0	66 ± 8 -0,63 ± 0,21	54 ± 7 -0,93 ± 0,17	-12 ± 8 -0,30 ± 0,21	,040	,514	6,6	,037	,015
O2-β SPD, %	26 ± 2 0	21 ± 4 -0,24 ± 0,19	16 ± 4 -0,50 ± 0,18	-5,2 ± 3,1 -0,26 ± 0,16	,042	,486	7,4	,030	,107
C4-β SPD, μV^2/Hz	88 ± 5 0	66 ± 8 -0,53 ± 0,20	58 ± 6 -0,71 ± 0,16	-8 ± 5 -0,18 ± 0,12	,102	,200	28,0	,001	,025
F8-δ SPD, μV^2/Hz	71 ± 14 0	252 ± 106 +1,38 ± 0,81	1730 ± 831 +12,61 ± 6,3	+1478 ± 790 +11,23 ± 6,0	,062	,328	14,3	,007	,016
Variables currently not in the model	**Reference level (*n* = 88)**	**Initial level (*n* = 14)**	**Final level (*n* = 14)**	**Change after 4 Seanses**	**Wilks' Λ**	**Partial Λ**	**F to enter**	**p-level**	**Tolerancy**
P3-θ SPD, %	7,6 ± 0,3 0	6,1 ± 0,9 -0,53 ± 0,32	7,6 ± 0,8 0,00 ± 0,28	+1,5 ± 0,9 +0,53 ± 0,33	,223	,092	69,3	10^{-4}	,022
Fp1-δ SPD, μV^2/Hz	63 ± 13 0	358 ± 146 +2,51 ± 1,25	910 ± 449 +7,23 ± 3,83	+552 ± 374 +4,71 ± 3,19	,088	,232	23,2	,002	,013
P4-δ PSD, %	19,1 ± 1,3 0	31 ± 5 +0,98 ± 0,43	40 ± 7 +1,69 ± 0,53	+9 ± 6 +0,71 ± 0,47	,065	,313	15,4	,006	,023
T5-α SPD, %	37 ± 2 0	22 ± 4 -0,69 ± 0,19	29 ± 6 -0,35 ± 0,27	+7 ± 4 +0,34 ± 0,21	,026	,775	2,0	,197	,079
T5-α SPD, μV^2/Hz	134 ± 16 0	69 ± 25 -0,43 ± 0,16	112 ± 39 -0,14 ± 0,26	+43 ± 25 +0,28 ± 0,16	,169	,121	50,8	10^{-4}	,010
T4-α SPD, μV^2/Hz	134 ± 13 0	42 ± 8 -0,75 ± 0,06	59 ± 16 -0,61 ± 0,13	+17 ± 11 +0,14 ± 0,09	,063	,327	14,4	,007	,017
F4-α SPD, %	41 ± 2 0	20 ± 4 -1,07 ± 0,19	26 ± 5 -0,77 ± 0,29	+6 ± 3 +0,30 ± 0,16	,085	,241	22,1	,002	,017
O1-θ SPD, %	5,27 ± 0,34 0	5,55 ± 0,85 +0,09 ± 0,27	6,49 ± 0,85 +0,39 ± 0,27	+0,95 ± 0,60 +0,30 ± 0,19	,027	,768	2,1	,189	,190
O1-α SPD, %	48 ± 3 0	28 ± 7 -0,77 ± 0,26	33 ± 7 -0,58 ± 0,28	+4,9 ± 2,5 +0,19 ± 0,10	,047	,434	9,1	,019	,023
P3-β SPD, μV^2/Hz	100 ± 5 0	74 ± 11 -0,54 ± 0,23	57 ± 6 -0,89 ± 0,12	-17,1 ± 8,6 -0,35 ± 0,18	,020	1,0	,00	,99	,040
α-rhythm Index, %	50 ± 3 0	40 ± 9 -0,32 ± 0,30	51 ± 9 +0,03 ± 0,28	+11 ± 5 +0,35 ± 0,15	,020	,992	,05	,83	,014
F3-α SPD, %	42 ± 2 0	23 ± 4 -0,97 ± 0,22	29 ± 6 -0,63 ± 0,31	+6,5 ± 3,1 +0,33 ± 0,16	,020	,983	,08	,78	,039

stimulation course increases the reduced area of GDI to the lower normal zone. However, the initial asymmetry of the GDI (f) becomes even more pronounced. Other biophysical parameters do not change significantly. Instead, changes in the parameters of the virtual Chakras were detected.

According to existent ideas, Chakras are power centers, related to the endocrine glands and neural plexus as well as to some organs. In particular, the first Chakra is related to the testicles and sacral plexus, second Chakra to the ovaries, adrenals and kidneys, third Chakra to spleen, liver and solar plexus, fourth

Table 2

Standardized, Structural and Raw Coefficients and Constant for EEGs variables

Variables currently in the model	Standardized	Structural	Raw
F8-δ SPD, μV²/Hz	-6,539	,050	-,003
P3-θ SPD, %	6,510	,036	2,011
Fp1-δ SPD, μV²/Hz	7,778	,033	,006
P4-δ PSD, %	5,472	,029	,240
T5-α SPD, %	1,710	,029	,090
T5-α SPD, μV²/Hz	9,432	,026	,076
T4-α SPD, μV²/Hz	-6,276	,027	-,132
F4-α SPD, %	6,676	,025	,383
O1-θ SPD, %	1,118	,022	,351
O1-α SPD, %	-4,994	,014	-,190
θ-rhythm Deviation, Hz	-3,458	-,057	-6,153
F3-β SPD, μV²/Hz	-2,660	-,045	-,121
β-rhythm Amplitude, μV	7,003	-,042	3,010
O2-β SPD, μV²/Hz	-9,131	-,040	-,156
δ-rhythm Asymmetry, %	-5,209	-,035	-,217
C3-β SPD, μV²/Hz	2,541	-,034	,109
P4-β SPD, %	1,546	-,033	,119
P4-β SPD, μV²/Hz	5,713	-,031	,205
O2-β SPD, %	-2,218	-,028	-,161
C4-β SPD, μV²/Hz	-5,664	-,020	-,201
Eigenvalue	47,856	**Constant**	-33,1
R = 0,990; Wilks' Λ = 0,020; $\chi^2_{(20)}$ = 62; $p < 10^{-5}$			

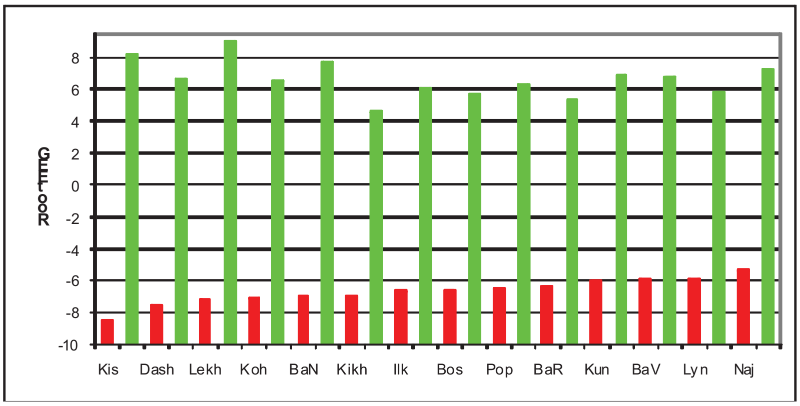

Fig. 5. Individual values of the canonical discriminant EEGs root before (red columns) and after (green columns) four-day electrostimulation course with the device "VEB-1"

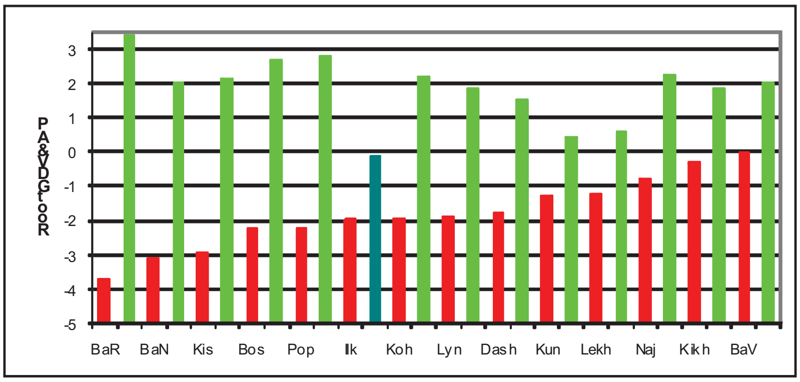

Fig. 6. Individual values of the canonical discriminant GDVs root before (red columns) and after (green columns) four-day electrostimulation course with the device "VEB-1"

Chakra to thymus, heart and cardial plexus, fifth Chakra to thyroid and parathyroid glands, sixth Chakra to pituitary gland and brain, seven Chakra to pineal gland [13].

As you can see, the second, third, fourth, sixth and seventh Chakras were shifted to the right, and after the course of electrostimulation, the asymmetry of the volunteers was leveled out. However, right-side asymmetry of the second Chakra, registered with the filter, reversed to the left-hand side. The decrease of energy deficit of the second and seventh chakras was also revealed.

Conclusion

A four-day electrostimulation course causes on males with dysfunction of the neuro-endocrine-immune complex and metabolism a notable neuro-modulating effect evaluated by changes in basal EEG. This is accompanied by changes to a number of GDV parameters.

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Table 3

Discriminant Function Analysis Summary for parameters of GDV

Step 9, N of vars in model: 9; Grouping: 2 grps;
Wilks' Λ: 0,219; approx. $F_{(9,2)} = 7{,}1$; $p < 10^{-3}$

Variables currently in the model	Reference level (*n* = 88)	Initial level (*n* = 14)	Final level (*n* = 14)	Change after 4 Seanses	Wilks' Λ	Partial Λ	F-remove (1,2)	p-level	Tolerancy
Area GDI in Left projection, kPixels	24,5 ± 0,50	22,3 ± 1,2 -0,51 ± 0,27	23,4 ± 0,9 -0,25 ± 0,21	+1,1 ± 0,5 +0,26 ± 0,11	,397	,552	14,6	,001	,063
Symmetry GDI (f), %	94,7 ± 0,10	93,67 ± 0,31 -1,55 ± 0,47	92,62 ± 0,47 -3,14 ± 0,70	-1,05 ± 0,46 -1,58 ± 0,69	,337	,648	9,8	,006	,352
Chak 2 Asymmetry (f)		+0,06 ± 0,04	-0,09 ± 0,05	-0,15 ± 0,05	,225	,970	,5	,468	,406
Chakra 2 Asymmetry	+0,11 ± 0,04	+0,12 ± 0,06	0,00 ± 0,07	-0,12 ± 0,11	,243	,902	2,0	,179	,538
Chak 7 Asymmetry (f)		+0,06 ± 0,03	-0,05 ± 0,03	-0,11 ± 0,04	,269	,813	4,1	,057	,393
Chakra 6 Asymmetry	+0,04 ± 0,02	+0,08 ± 0,05	-0,02 ± 0,05	-0,09 ± 0,05	,268	,816	4,1	,059	,550
Chak 4 Asymmetry (f)		+0,04 ± 0,03	-0,03 ± 0,05	-0,07 ± 0,06	,282	,776	5,2	,035	,499
Chakra 2 Energy	-0,08 ± 0,05	-0,32 ± 0,16	-0,24 ± 0,10	+0,08 ± 0,07	,268	,817	4,0	,060	,081
Variable currently not in the model	**Reference level (*n* = 88)**	**Initial level (*n* = 14)**	**Final level (*n* = 14)**	**Change after 4 Seanses**	**Wilks' Λ**	**Partial Λ**	**F to enter**	**p-level**	**Tolerancy**
Chakra 7 Energy	+0,04 ± 0,03	-0,29 ± 0,07	-0,22 ± 0,07	+0,08 ± 0,03	,217	,99	,141	,71	,161
Chakra 7 Energy (f)		-0,10 ± 0,05	-0,05 ± 0,06	+0,05 ± 0,02	,218	,99	,078	,78	,504
Chakra 3 Asymmetry	+0,22 ± 0,04	+0,15 ± 0,04	+0,04 ± 0,04	-0,10 ± 0,04	,212	,97	,527	,48	,401
Chakra 7 Asymmetry	+0,10 ± 0,03	+0,12 ± 0,04	-0,02 ± 0,05	-0,14 ± 0,06	,218	1,0	,047	,83	,826

Accordance To Ethics Standards

Tests in volunteers are conducted in accordance with positions of Helsinki Declaration 1975, revised and complemented in 2002, and directive of National Committee on ethics of scientific researches. During realization of tests from all participants the informed consent is got and used all measures for providing of anonymity of participants.

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ОСОБЛИВОСТІ МІКРОТВЕРДОСТІ ЕМАЛІ ПОСТІЙНИХ ПРЕМОЛЯРІВ ТА ІКЛІВ ЛЮДИНИ В РІЗНИХ ЧАСТИНАХ КОРОНКИ ЗУБА

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ОСОБЕННОСТИ МИКРОТВЕРДОСТИ ЭМАЛИ ПОСТОЯННЫХ ПРЕМОЛЯРОВ И КЛЫКОВ ЧЕЛОВЕКА В РАЗНЫХ ЧАСТЯХ КОРОНКИ ЗУБА

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THE FEATURES OF DENTAL ENAMEL MICROHARDNESS IN DIFFERENT ZONES OF CROWN OF HUMAN PERMANENT PREMOLAR AND CANINE TEETH

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Summary/Резюме

The microhardness of the tooth enamel of human permanent premolars and canines differs in different parts of the crown. The microhardness of the enamel is lower in the sections of the predominantly straight-line orientation of enamel prisms.