

Popovych Igor L., Babelyuk Valeriy Ye., Zukow Walery, Muszkieta Radoslaw, Dubkova Galyna I., Nesterova Liliya F., Hubyts'kyi Viktor Y., Bilas Volodymyra R., Musiyenko Vira Y., Seniv Teodor S., Mis'ko Volodymyr T., Babylyuk Roman V., Yaremchuk Yaroslava M., Barylyak Liliya G., Gozhenko Anatoliy I. Liturgy affects the parameters of gas discharge visualization, acupuncture points and neuro-endocrine-immune complex. *Pedagogy and Psychology of Sport*. 2020;6(2):61-73. eISSN 2450-6605. DOI <http://dx.doi.org/10.12775/PPS.2020.06.02.006> <https://apcz.umk.pl/czasopisma/index.php/PPS/article/view/PPS.2020.06.02.006> <https://zenodo.org/record/3766916>

The journal has had 5 points in Ministry of Science and Higher Education parametric evaluation. § 8. 2) and § 12. 1. 2) 22.02.2019.

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The authors declare that there is no conflict of interests regarding the publication of this paper.

Received: 05.04.2020. Revised: 16.04.2020. Accepted: 26.04.2020.

Liturgy affects the parameters of gas discharge visualization, acupuncture points and neuro-endocrine-immune complex

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Abstract

Background. The impact of religion on the human body has been the subject of a number of studies, including ours. The proposed article is a continuation of them. **Purpose** of the study: to detect in the supervised observation the characteristic effects of the Liturgy on some biophysical and physiological parameters of healthy people. **Materials and methods.** Under a observations were 10 healthy men by age 26-56 years. In the morning in basale condicions registered parameters of Gas Discharge Visualization (GDV), electroskin conductivity of Points Acupuncture (CPA), Heart Rate Variability (HRV), Leukocytogram, phagocytic function of neutrophils as well as anxiety and plasma levels of main adaptive hormones: Cortisol, Triiodothyronine and Testosterone. After testing, one volunteer went to a chapel to attend a half-hour Liturgy, and another volunteer was in the park nearby, serving as a control. After that, both participants returned to their duties, and after 1 hour all tests were repeated. **Results.** The characteristic effects of the Liturgy are: minimization the decrease in CPA TR(X) and G8Dg on the right, reactive anxiety, cortisolemia and one marker of vagal tone; limitation the increase in the area of the GDV in the frontal projection and the intensity of phagocytosis; initiation an increase in plasma testosterone, entropy of the leukocytogram and the proportion of rod-core neutrophils, as well as reversion the decrease in the tone of the vagus and the decrease of the energy of the virtual seventh chakra, which takes place in the control group. **Conclusion.** Liturgy

affects the parameters of gas discharge visualization, acupuncture points and neuro-endocrine-immune complex in healthy men.

Key words: Liturgy, gas discharge visualization, acupuncture point electroconductivity, heart rate variability, testosterone, cortisol, triiodothyronine, phagocytosis, entropy, anxiety.

INTRODUCTION

*Science without religion is lame,
religion without science is blind.
There can be no real conflict
between religion and science.*

Albert Einstein.

Science and Religion. Nature. 1940.

The impact of religion on the human body has been the subject of a number of studies [5,13], including ours [2,3,16-20]. The proposed article is a continuation of them. **Purpose** of the study: to detect in the supervised observation the characteristic effects of the Liturgy on some biophysical and physiological parameters of healthy people.

To achieve this goal, we have applied Western and Oriental medicine approaches.

According to existent paradigm, 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 Chakra to thymus, heart and cardiac plexus, fifth Chakra to thyroid and parathyroid glands, sixth Chakra to pituitary gland and brain, seven Chakra to pineal gland [22].

It is believed that the state of the Chakras can be estimated by gas-discharge visualization (GDV) [11,12].

Previously, we showed that in practically healthy men the parameters of GDV are appropriately related to their trait and reactive anxiety, levels in plasma of triiodothyronine, testosterone and cortisol as well as mineralocorticoid activity, appraised after Na/K-ratio of plasma. Most determined from the side of psychophysiological and endocrine parameters is entropy of gas discharge image in the left projection with a filter and without filter, symmetry and area of GDV in a frontal projection with a filter and coefficient of form of GDV in the left projection with a filter and in a frontal projection without filter. On the whole endocrine status determines kirlianogram on 90%. Thus, the parameters of GDV represent the registered psychophysiological and endocrine parameters of organism of human objectively [1]. We showed also relations between the parameters GDV and HRV [15]. In another study, we found links between the parameters of the neuroendocrine-immune complex and the electrical conductivity of acupuncture points [8].

This was the basis for the design of this study.

MATERIAL AND RESEARCH METHODS

Under a observations were 10 men by age 26-56 years, workers of sanatorium "Moldova", four of them are the authors of this article

In the morning in basale condicions at first registered (**GI Dubkova**) kirlianogram by the method of Gas Discharge Visualization (GDV) by the device "GDV Chamber" ("Biotechprogress", St-Pb, RF) [11,12]. For further analysis the following parameters were selected: Area of gas discharge image; Coefficient of Shape as ratio Square Length of outward contour gas discharge image to its Area; Entropy of contour in Right, Frontal and Left projections as well as Energy and Asymmetry of virtual Chakras registered both with and without poliethylene filter.

Then recorded (**LF Nesterova**) ECG in standard lead II by the hardware-software complex "Cardiolab+VSR" ("KhAI Medica", Kharkiv). For further analysis the following parameters heart rate variability (HRV) were selected. Temporal parameters (Time Domain Methods): the standart deviation of all NN intervals (SDNN) and the square root of the mean of the sum of the squares of differences between adjacent NN intervals (RMSSD). Spectral parameters (Frequency Domain Methods): spectral power density (SPD) of HRV bands: high-frequency (HF, range 0,4÷0,15 Hz), low-frequency (LF, range 0,15÷0,04 Hz), very low-frequency (VLF, range 0,04÷0,015 Hz) and ultra low-frequency (ULF, range 0,015÷0,003 Hz) [4,7].

Electroskin conductivity recorded (**VY Hubyts'kyi**) in follow points of acupuncture: G8Dg, Pg(ND), TR(X) and MC(AVL) at Right and Left side. Used complex "Medissa".

In portion of capillary blood counted up Leukocytogram (**VY Musiyenko**), on the basis of which calculated Entropy (h) by the formula:

$$h = - (Eo \cdot \log_2 Eo + StubN \cdot \log_2 StubN + SegN \cdot \log_2 SegN + Mon \cdot \log_2 Mon + Lym \cdot \log_2 Lym) / \log_2 5.$$

Whereupon took from an ulnar vein the blood for determination (**YM Yaremchuk**) of plasma levels of main adaptive hormones: cortisol, triiodothyronine and testosterone by the ELISA with the use of analyser "Tecan" (Österreich) and corresponding sets of reagents from "Alkor Bio" Ltd (St-Pb, RF [9].

In this blood determined (**VR Bilas**) also parameters of phagocytic function of neutrophils: activity (percentage of neutrophils, in which found microbes - Phagocytic Index), intensity (number of microbes absorbed one phagocytes - Microbial Count) and completeness (percentage of dead microbes - Killing Index) using museum culture Staphylococcus aureus (ATCC N 25423 F49) obtained from Laboratory of Hydrogeological Regime-operational Station spa Truskavets'.

At last volunteers filled a questionnaire with the purpose of estimation of level of the trait and reactive anxiety [21].

After testing, one volunteer went to a chapel located on the territory of the sanatorium to attend a half-hour Liturgy conducted by Greek Catholic Father Zynoviy, and another volunteer was in the park nearby, serving as a control. After that, both participants returned to their duties, and after 1 hour all tests were repeated. The investigation have been conduct during 9-13 August 2010.

Results processed by method of discriminant analysis, using the software package "Statistica 5.5".

RESULTS AND DISCUSSION

Based on the results of the screening, a constellation of parameters was selected, the relationship between the levels of which at first and retesting is worth considering. Further, for the construction of profiles, actual values (V) were expressed in Z-scores:

$Z = (V/N-1)/Cv$, where
 N is norm level, Cv is coefficient of variation.

It was first discovered (Fig. 1) that, despite the absence of a clinical diagnosis, volunteers have deviations from the narrowed norm ($\pm\sigma$) of a number of parameters. In particular, they have increased levels of cortisol and electrical conductivity of **right** (but not left) acupuncture points, as well as trait anxiety (in six in the range 46÷59, in four in the range 30÷39, not displayed on the profile) combined with reduced reactive anxiety (in five<31).

Further, in the control group, the results of retesting and initial testing differed to one degree or another. Apparently, this is a consequence of the biorhythmic trend and/or professional activity for an hour.

In particular, the electrical conductivity of acupuncture points and cortisol levels were completely normalized, sympathetic tone markers (LF/HF and LFnu) tended to increase, while vagal correlates (HF and RMSSD as well as LF) decreased to a narrowed norm, and the marker of total Autonomous Regulation (SDNN) declined significantly. In addition, a tendency for an increase in the Area of GDI in the Frontal projection as well as the intensity of phagocytosis was detected.

Let us consider separately the laterality (L) of the electrical conductivity calculated by the formula:

$$L(\%) = 200(R-L)/(R+L).$$

It was found (Fig. 2) that in the control group minimal right-sided lateralization of the three points remained unchanged, and for MC(AVL) points there was a complete symmetry of electrical conductivity.

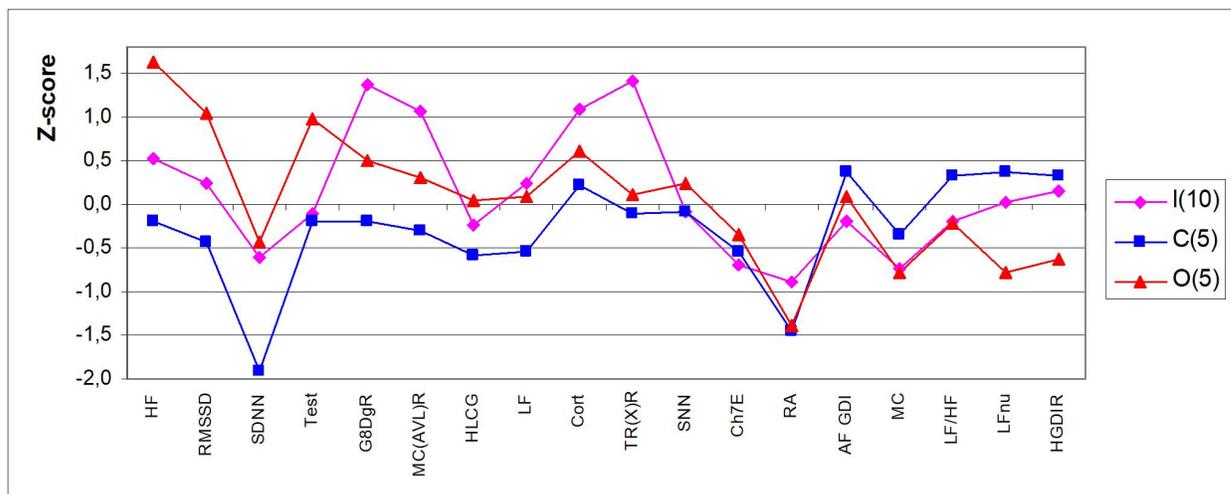


Fig. 1. Profiles of normalized parameters: initial (I) and after 1,5 hours in control (C) and main (O) groups

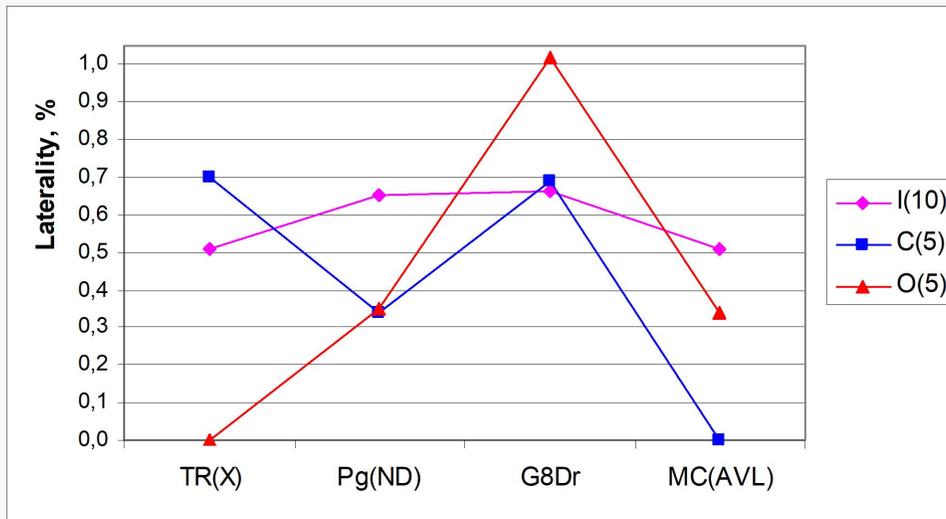


Fig. 2. Profiles of Laterality of the electrical conductivity of acupuncture points: initial (I) and after 1,5 hours in control (C) and main (O) groups

The profile of the members of the main group differs from the initial and the control group. Apparently, it reflects the result of the interaction of control factors (biorhythm trends, professional work, etc.) and Liturgical factors. An estimation of the independent (itself/per se) effect of the Liturgy, in our opinion, can be obtained as the algebraic sum of both profiles. In particular, if the deviation of the parameter level relative to the initial one in the main and control group is in the opposite direction, then the stimulating or suppressing effect of the Liturgy itself is actually greater. Conversely, in cases of one-way deviations, the independent influence of the Liturgical factors as such is weaker.

If we take the proposed approach to assess the impact of Liturgy on the registered parameters of the organism, we reach the following conclusions (Fig. 3).

First of all, the Liturgy has a significant **upregulating** effect on HRVs markers of vagal tone and plasma testosterone levels. The conductivity of the AP G8Dg and MC(AVL) on the right increases to a lesser extent, which makes the right asymmetry even more pronounced (Fig. 4), as well as the entropy of the leukocytogram. The minimal stimulating effect of the Liturgy is on the level of cortisol and rod-nuclear neutrophils, as well as the energy of the seventh chakra and the electrical conductivity of AP TR (X) on the right, which is accompanied by its left-sided lateralization (Fig. 4).

On the other hand, the maximum **downregulating** effect of Liturgy is on sympathetic tone and entropy of GDI, less pronounced on GDI area and intensity of phagocytosis. And the adjusted impact of the liturgy on reactive anxiety was **null**.

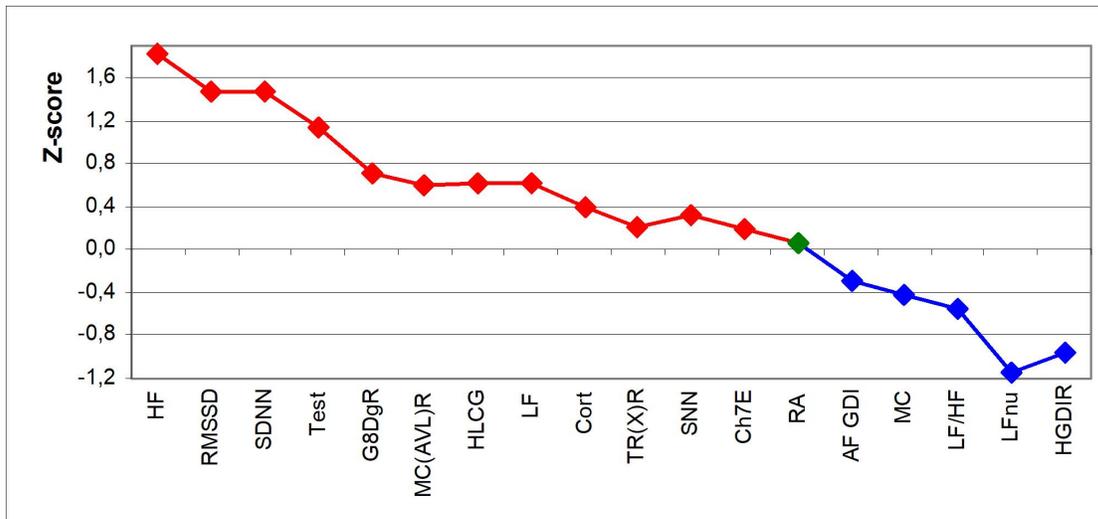


Fig. 3. The profile of the effects of the Liturgy itself (per se), reconstructed according to the differences between the parameters of the main and control groups

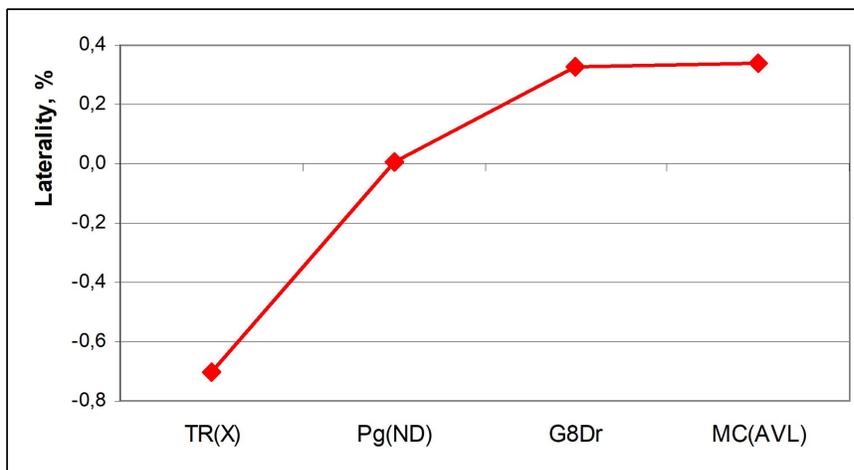


Fig. 4. The profile of the effects of the Liturgy itself on Laterality of the electrical conductivity of acupuncture points, reconstructed according to the differences between the parameters of the main and control groups

However, discriminant analysis (method forward stepwise [10]) as characteristic selected only 13 parameters, including 3 HRVs, 3 immune, 2 endocrine, 2 GDV, 2 PAs as well as reactive anxiety (Table 1).

Discriminant information is condensed into two roots. The major root contains 95,7% of the recognition capabilities, and the minor one only 4,3%.

The factor structure of the major root is formed by 7 variables, 5 of which correlate with the root **inversely**, and 2 **directly**. The minor root represents **directly** 6 discriminant variables (Table 2).

The sum of products of raw coefficients on the value of discriminant variables together with the constant (Table 2) gives the values of root for each person and allow their visualization.

Table 1. Discriminant Function Analysis Summary
 Step 13, N of variables in model: 13; Grouping: 3 grps
 Wilks' Lambda: 0,0011; approx. $F_{(26,1)}=11,2$; $p=0,0002$

Variables currently in model	Wilks' Λ	Partial Λ	F-remove (2,5)	p-level	Tolerance	
Conductivity PA TR(X) R, un	,0043	,257	7,2	,033	,039	
Reactive anxiety, points	,0267	,041	57,9	10^{-3}	,024	
PSD HF HRV, msec ²	,0056	,197	10,2	,017	,007	
Microbial Count, Bact./Phagoc.	,0019	,575	1,8	,251	,053	
Testosterone, nM/L	,0014	,765	0,8	,512	,439	
PSD LF HRV, msec ²	,0020	,540	2,1	,214	,060	
Entropy of Leukocytogram	,0172	,064	36,5	,001	,029	
Area frontal GDV, kpixels	,0186	,059	39,6	10^{-3}	,010	
Chakra 7 Energy	,0092	,120	18,3	,005	,009	
Cortisol, nM/L	,0062	,177	11,6	,013	,024	
Stubnucleary Neutrophils, %	,0048	,232	8,3	,026	,086	
RMSSD HRV, msec	,0027	,409	3,6	,107	,010	
Conductivity PA G8Dg R, un	,0021	,526	2,3	,201	,030	
Chi-Square Tests with Successive Roots Removed						
Roots Removed	Eigen-value	Canonical R	Wilks' Λ	χ^2	Degree freedom	p-level
0	131	0,996	0,0011	75	26	10^{-6}
1	5,85	0,924	0,1460	21	12	,048

Table 2. Standardized, Raw and Structural Coefficients and Constants for Canonical Variables

Variables currently in model	Standardized		Raw		Structural	
	Root 1	Root 2	Root 1	Root 2	Root 1	Root 2
Conductivity PA TR(X) R, un	-4,33	-0,91	-3,419	-0,717	-0,101	-0,137
Conductivity PA G8Dg R, un	-3,86	1,03	-2,313	0,618	-0,074	0,005
Reactive anxiety, points	-6,30	-0,53	-1,078	-0,090	-0,029	-0,044
SPD LF HRV, msec ²	1,77	-2,30	0,0030	-0,0040	-0,028	0,025
Cortisol, nM/L	5,83	-1,17	0,0215	-0,0043	-0,027	0,002
Area frontal GDV, kpixels	9,23	-2,55	3,20	-0,90	0,047	-0,014
Microbial Count, Bacter/Phag	-2,73	-0,84	-1,053	-0,324	0,014	-0,052
Testosterone, nM/L	0,21	0,76	0,0269	0,0956	0,007	0,213
Entropy of Leukocytogram	-5,46	1,75	-136	43,69	-0,010	0,104
Stubnucleary Neutrophils, %	-2,82	1,11	-3,607	1,414	0,005	0,097
SPD HF HRV, msec ²	10,19	-3,24	0,0078	-0,0025	-0,009	0,144
RMSSD HRV, msec	-6,30	4,61	-0,223	0,163	-0,012	0,138
Chakra 7 Energy	-9,71	2,79	-54,23	15,57	0,013	0,073
Constants			389,6	1,357		
Discriminant Properties			95,7 %	4,3 %		

As we can see (Figs. 5-6, Table 3), the characteristic effects of the Liturgy are, first and foremost, to minimize the decrease in electrical conductivity in PA TR(X) and G8Dg on the right, reactive anxiety, cortisolemia and the spectral power density of the LF band HRV, observed in the control group. On the other hand, the Liturgy restrains the increase in the area of the gas-discharge image in the frontal projection and the intensity of phagocytosis Staph. aureus by

neutrophils, which takes place in the control group.

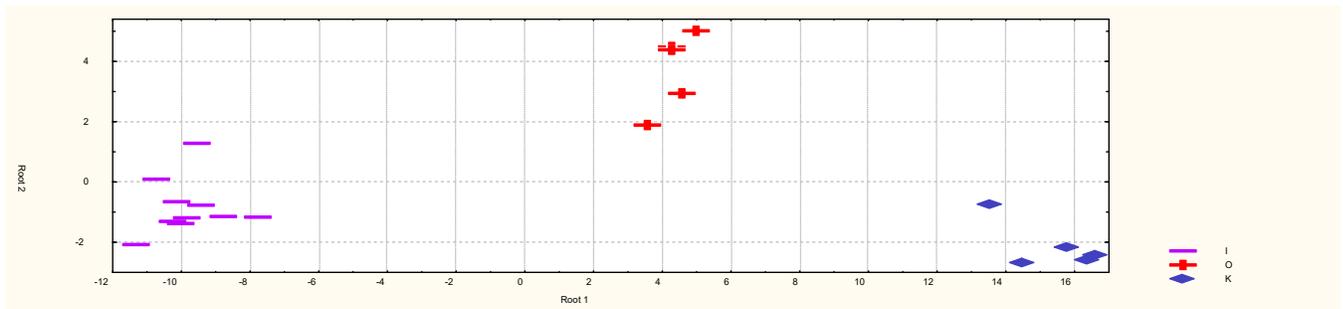


Fig. 5. Individual values of the two roots, in which condensed recognition information about the initial condition of the person (I) and after the Liturgy (O) or retest (K)

Table 3. Summary of Stepwise Analysis

Variables currently in model	Initially state (n=10)	Oranta group (n=5)	Control group (n=5)	F to enter	p-level	Λ	F value	p-level
Conduct PA TR(X) R, un	60,8±0,5	58,2±0,4	57,8±0,4	12,4	,001	,407	12,4	10 ⁻³
Conduct PA G8Dg R, un	60,7±0,6	59,0±0,3	57,6±0,8	2,25	,201	,001	11,2	10 ⁻³
Reactive anxiety, points	31,8±1,9	28,2±3,1	27,8±1,7	5,79	,013	,236	8,5	10 ⁻⁴
SPD LF HRV, msec ²	882±232	718±146	452±151	2,75	,104	,045	7,4	10 ⁻⁴
Cortisol, nM/L	634±86	534±148	451±84	1,86	,217	,007	9,0	10 ⁻⁴
Area frontal GDV, kpixel	23,67±1,09	25,39±1,03	27,12±0,77	4,44	,042	,016	8,5	10 ⁻⁵
Microbial Count, B/Phag	12,3±0,8	12,2±1,1	13,4±1,4	3,86	,046	,095	7,9	10 ⁻⁴
Testosterone, nM/L	24,4±2,9	32,9±3,3	23,6±1,8	2,81	,097	,066	7,5	10 ⁻⁴
Entropy Leukocytogram	0,66±0,01	0,68±0,02	0,65±0,01	2,54	,124	,031	7,3	10 ⁻⁴
Stubnucl. Neutrophils, %	3,40±0,22	3,80±0,37	3,40±0,40	3,09	,109	,004	10,1	10 ⁻⁴
SPD HF HRV, msec ²	767±311	1457±996	229±92	4,53	,029	,147	8,0	10 ⁻⁴
RMSSD HRV, msec	37±8	50±18	23±6	2,05	,210	,002	10,4	10 ⁻⁴
Chakra 7 Energy	-0,14±0,05	-0,05±0,08	-0,10±0,09	3,10	,094	,010	9,1	10 ⁻⁴
Means of Canonical Roots	Root 1	-9,8±0,3	+4,3±0,2	+15,3±0,6				
	Root 2	-0,82±0,29	+3,75±0,58	-2,11±0,35				

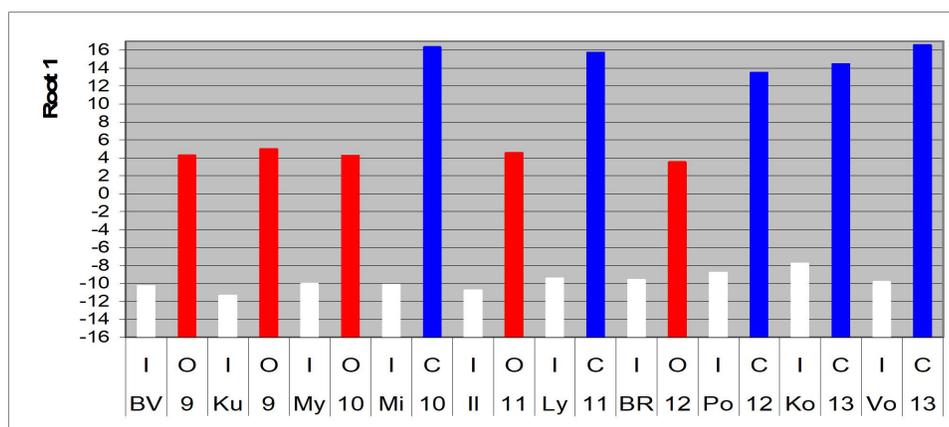


Fig. 6. Individual magnitudes of the major discriminant root of members of the main and control groups, which reflect the moderating effect of the Liturgy on the decrease/increase of the levels of parameters, the information of which is condensed in this root. Volunteer code and date (August 2010) of testing submitted

At the same time, the Liturgy initiates an increase in plasma testosterone, entropy of the leukocytogram and the proportion in it of rod-core neutrophils, as well as reverses the decrease in the tone of the vagus and the decrease of the energy of the virtual seventh chakra, observed in the control group (Figs. 5 and 7, Table 3).

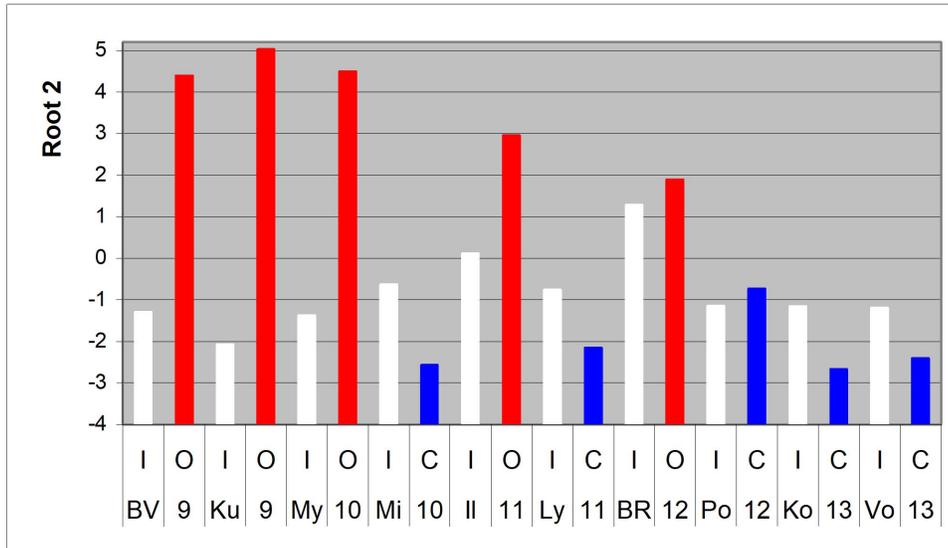


Fig. 7. Individual magnitudes of the minor discriminant root of members of the main and control groups, which reflect the initiation/enhancement under the influence of the Liturgy of raising the levels of parameters, the information of which is condensed in this root

The described specific effects of the Liturgy are even more clearly illustrated in Figs. 8-10.

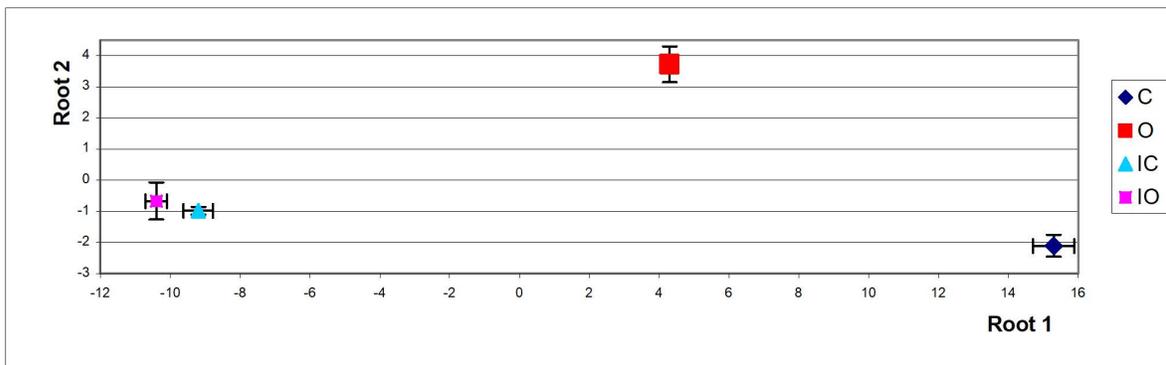


Fig. 8. Average levels (Mean±SE) of the two roots, in which condensed information about the condition of the person before (IO&IC) and after the Liturgy (O) or retest (C)

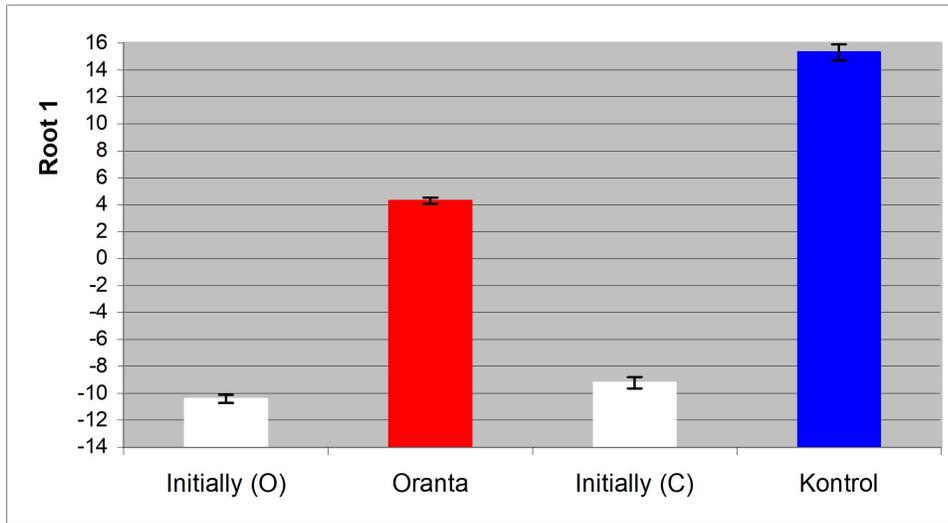


Fig. 9. Average levels of the major root, reflecting the moderating effect of the Liturgy

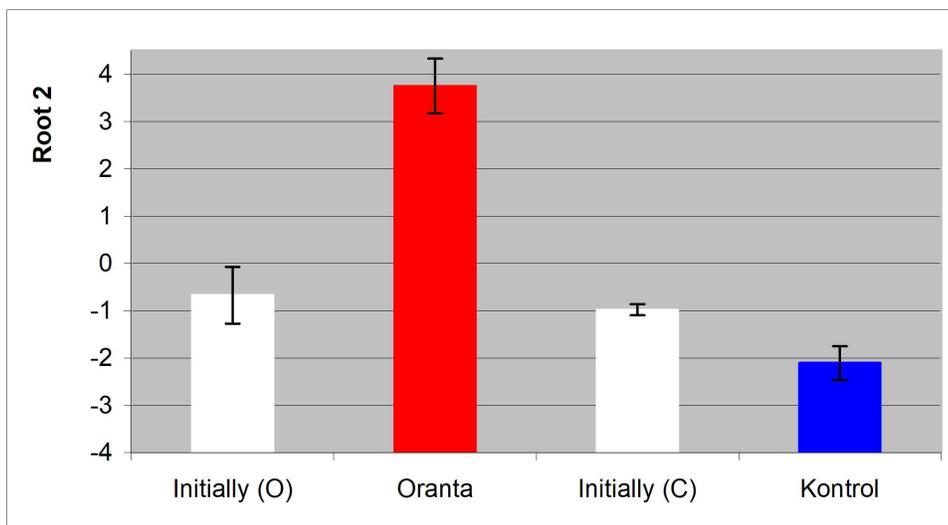


Fig. 10. Average levels of the minor discriminant root of members of the main and control groups, which reflect the enhancing effect of the Liturgy

Despite the obvious cluster delineation, we document it by calculating Mahalanobis distances (Table 4).

Table 4. Squared Mahalanobis Distances (above), F-values (df = 13,5) (below) and p-levels

Clusters	I	O	C
Initially State (I)		259	745
Oranta group (O)	16,2 0,003		183
Control group (C)	46,7 <10⁻³	8,3 0,015	

Finally, we present the classification discriminant functions that allow for the error-free retrospective identification of the members of each cluster (Table 5).

Table 5. Coefficients and Constants for Classification Functions

Variables currently in model	Initially State	Oranta group	Control group
	n=10	n=5	n=5
Conductivity PA TR(X) R, units	1365	1313	1280
Reactive anxiety, points	429,4	413,8	402,5
SPD HF HRV, msec ²	-3,27	-3,17	-3,07
Microbial Count, Bacter/Phagoc	484,6	468,3	458,6
Testosterone, nM/L	-9,38	-8,56	-8,82
SPD LF HRV, msec ²	-1,47	-1,45	-1,39
Entropy of Leukocytogram	53478	51759	50004
Area frontal GDV, kpixels	-1290	-1240	-1200
Chakra 7 Energy, units	21808	21114	20425
Cortisol, nM/L	-8,91	-8,63	-8,37
Stubnucleary Neutrophils, %	1502	1458	1410
RMSSD HRV, msec	96,7	94,3	90,9
Conductivity PA G8Dg R, units	1000	970	941
Constants	-82134	-76600	-72417

CONCLUSION

So, in a controlled study, we showed that Liturgy affects the parameters of gas discharge visualization, acupuncture points and neuro-endocrine-immune complex in healthy men.

Earlier IL Popovych in autoexperiments found that immediately after the Prayer **silently** "Our Father ..." and "Hail Mary ..." as well as immediately after the swallow Holy Water, parameters of HRV and EEG, recorded synchronously significantly differ from the initial settings [17-20].

To identify the effects of Holy water on the parameters of HRV and EEG and clarify the role of autosuggestion and information a separate study was conducted [16]. In 5 male volunteers performed 79 items HRV and EEG in the basal period and 25 tracks with 1,5 h after drinking 30 ml of water well, distilled, filtered, Holy (blind) and the well water indicates that it Holy (placebo). Preliminary analysis revealed no significant differences between neurotropic effects of well, distilled and filtered waters, because for further analysis they were combined in a cluster "control waters". We found 48 parameters of HRV and EEG, in which a set of clusters "control waters", "Holy water" and "placebo" significantly different from each other and from the basal level. These parameters formed 9 patterns that demonstrate the stimulating or inhibitory neurotropic effect: 1) only placebo; 2) only Holy water; 3) placebo and Holy water as 3.1) opposite and 3.2) approximately equally. Thus, neurotropic effects the Holy water is like

autosuggestion and information (Divine) nature.

It seems to us that these conclusions are acceptable for this study.

ACKNOWLEDGMENT

We express sincere gratitude to administration of JSC “Truskavets’kurort” and clinical sanatorium “Moldova” for help in conducting this investigation. Special thanks to Father Zynoviy and the volunteers.

ACCORDANCE TO ETHICS STANDARDS

Tests in patients 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.

For all authors any conflict of interests is absent.

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