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MULTIPLE LAZEROTHERAPY AS A SITE OF REHABILITATION VEGETOLOGY

(INFORMATION 2)

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Наведені матеріали не мають аналогів. Вперше реабілітаційна ефективність розсіяної лазеротерапії оцінюється за впливом на функціональні рівні вегетативного гомеостазу. Робиться висновок про необхідність вегетативної діагностики за методом В.Макаца в фізіотерапевтичній практиці.
Ключові слова: розсіяна лазеротерапія, функціонально-вегетативна діагностика.

The above materials have no analogues. For the first time the rehabilitation efficiency of scattered laser therapy is evaluated for the effect on the functional levels of vegetative homeostasis. A conclusion is made on the necessity of vegetative diagnostics by the method of V.Makats in physiotherapeutic practice.
Key words: scattered laser therapy, functional-vegetative diagnostics.

Приставленные материалы не имеют аналогов. Впервые реабилитационная эффективность рассеянной лазеротерапии оценивается по влиянию на функциональные уровни вегетативного гомеостаза. Делается вывод о необходимости вегетативной диагностики по методу В.Макацу в физиотерапевтической практике.
Ключевые слова: рассеянная лазеротерапия, функционально-вегетативная диагностика.

Urgency of the issue of vegetative disorders. Disorders of the vegetative (autonomic) nervous system (VNS) cause from 25 to 80% of functional disorders of the reserves and mechanisms of adaptation to the changing environment, physical and psychosomatic loads [5]. By performing the integration role at the central level, the VNS provides regulation of vegetative homeostasis, systemic disorders of which determine the pathogenetic basis of functional and somatic diseases [2]. Their fundamental evaluation goes beyond certain parameters of vegetative regulation, requiring a systematic approach and the study of a holistic organism as a multilevel interdependent system [1,6,7]. Significant support for the problem of vegetative pathogenesis is the normalization of vegetative indicators in the rehabilitation period. In this case, special attention should be paid to the use of traditional FAZ (functional-active skin zones) [8,9].

Today, according to WHO recommendations, "electro-puncture diagnosis and reflexotherapy" should be the basis of rehabilitation medicine (WHO International Meeting, Yerevan, 19.09.03). At the same time, its General Assembly (2014) officially advises the states (participants of the WHO) to include these directions in the national health programs and draws attention to the development of biophysical methods for controlling the rehabilitation effectiveness of physiotherapeutic and preformed factors [6,7]. On this basis, it is worth paying attention to the recently discovered "Human functional-vegetative system " (FVS) [6], which proved the biophysical reality of traditional "acupuncture channels", their direct relation to vegetative homeostasis and requires its place in classical system physiology ...

As for laser therapy, note the following [4]. The use of low-intensity radiation of optical quantum generators (OQG) in physiotherapeutic practice has an extremely wide range of indications. Practically this is the only direction with minimal limitation (benign illness in the radiation zone, diabetes mellitus, individual intolerance to the factor). At the same time, attention is drawn to the complete absence of information on the impact of OQG on the

indicators of functional-vegetative homeostasis, the violation of which causes the development of any functional pathology...

The purpose and means of research. Our study has analogues and is a fragment of the program "Two-stage system of rehabilitation of vegetative disorders in children living in the zone of ecological (radiation) control of Ukraine" (Order of the Cabinet of Ministers of Ukraine № 12010/87). The purpose of the study is the autonomic orientation of the OQG at various initial levels of functional-vegetative disorders. The functional-vegetative diagnostic (FVD) method was chosen by the method of control of functional-β-autonomic efficiency of OQG by the method of V.G.Makats [6]. The latter is allowed for use in medical practice by the Academic Council of the Ministry of Health of Ukraine and its problem committees: Pediatrics, Obstetrics and Gynecology, Quantum Medicine, Hematology and Transfusiology, New Medical Technology and New Diagnostic Tools (Minutes No. 01.08-01 dated September 11, 1994).

The diagnostic complex "BIOTEST-12M" serves as the technical tool of the FVD. The latter does not use traditional external sources of current and admitted to the Ministry of Health of Ukraine (Minutes No.5 of December 25, 1991) for practical use. The probability of the obtained indicators was estimated by means of parametric and non-parametric statistics. The analysis of the results was carried out based on computer programs "Search" (development of the European Center for Postgraduate Education).

Table 1

Diagnostic Representative FAZ

Traditional channel	IAN *	FN	Traditional channel	IAN *	FN
Lungs	LU	P	Urinary bladder	BL	V
Large intestine	LI	GI	Kidney	KI	R
Stomach	ST	E	Pericardium	PC	MC
Spleen – Pancreas	SP	RP	Triple energizer	TE	TR
Heart	HT	C	Gall bladder	GB	VB
Small intestine	SI	IG	Liver	LR	F

Functional-autonomic systems ("acupuncture channels") are based on the international "acupuncture nomenclature" (MAN) proposed by the WHO (table 1). The following zones (levels) of functionally vegetative homeostasis [7]:

-PA-s (k to 0,75 = zone of significant parasympathetic activity) are scientifically substantiated according to the coefficients of functionally-vegetative homeostasis (k);

-PA-e (k 0,76-0,86 = zone of expressed parasympathetic activity);

-FcP (k 0,87-0,94 = functional compensation zone of parasympathetic activity);

-VE (k 0,95-1,05 = zone of vegetative equilibrium);

-FcS (k 1,06-1,14 = zone of functional compensation sympathetic activity);

-SA-e (k 1,14-1,26 = zone of expressed sympathetic activity);

-SA-s (k =>1,26=zone of significant sympathetic activity).

The planned research was conducted under the guidance of an expert of the higher level of the National Academy of Sciences of Ukraine, Doctor of Medical Sciences, Professor V.G. Makats.

Experimental part. 50 children of different sexes of junior and teenage school age were examined. FVD was twice held in the first half of the day (10^{00}-12^{00}) before and after the OQG session. The bioelectric activity of 12 symmetric pairs of functional-active skin zones (24 FAZs) was studied, 2204 tests were performed. The focus was on the direction of dispersion (dispersion) of the levels of integral vegetative homeostasis and the ratio of the activity of the leading systems of the first and second functional complexes: BL (controls the sympathetic) and SP (controls the parasympathetic) orientation of the vegetative

homeostasis. For OQG, the following areas of influence were selected: parasternal, epigastric and anterior abdominal wall, between the shoulder blade, lumbar sacral and hip (Femoral), knee and ankle joints.

Результати науково-дослідної роботи і її аналіз.

1. SETTLE-AGE FEATURES OF THE VEGETATIVE INFLUENCE "OQG". The conducted analysis shows that there is no gender-age specificity of the effect of rlt on the variance of vegetative levels. Under all conditions, the OQG causes a positive-vegetative orientation in the zone of permissible vegetative equilibrium: "FkP + VE + FkS" (fig.1.1). In this case, its use for the purpose of vegetative correction is inappropriate, but one should pay attention to the absence of "rehabilitation damage"... In other words, the use of rlt in physiotherapeutic practice does not have functional-vegetative contraindications (tab.1.1).

Vegetative levels dispersion in the female group (effect in %)

OQG	PA-s	PA-e	FkP	VE	FkS	SA-e	SA-s
to	8,00	8,00	44,00	24,00	12,00		4,00
after		8,00	32,00	48,00	4,00	8,00	

Impact on **SP-BL**

FVD	**SP**	**BL**
to		
after	+	+

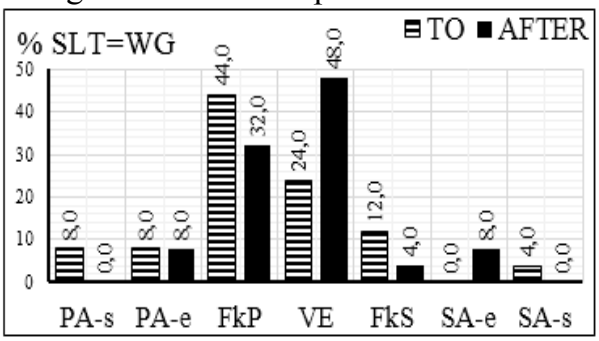
Dispersion of vegetative levels in the male group (effect in %)

OQG	PA-s	PA-e	FkP	VE	FkS	SA-e	SA-s
to		6,67	33,33	20,00	20,00	13,33	6,67
after		20,00	20,00	33,33	20,00		6,67

Impact on **SP-BL**

FVD	**SP**	**BL**
to		
after	+	+

Vegetative levels dispersion in theWG



Vegetative levels dispersion in the MG

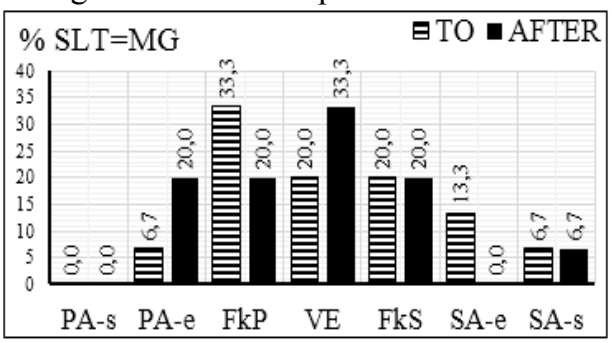


Fig.1

Table 1

Influence of OQG on variance of vegetative levels with initial (1) significant parasympathetic activity (PA-s) in female and male groups.

Vegetative disorientation in the WD (in%)								Vegetative disorientation in MD (in %)							
№	PAs	PAe	FkP	VE	FkS	SAe	SAs	№	PAs	PAe	FkP	VE	FkS	SAe	SAs
1	100							1							
2		50	50					2							

Influence of OQG on variance of vegetative levels with (1) initial expressed parasympathetic activity (PA-e) in female and male groups.

Vegetative disorientation in the WD (in%)								Vegetative disorientation in MD (in %)							
№	PAs	PAe	FkP	VE	FkS	SAe	SAs	№	PAs	PAe	FkP	VE	FkS	SAe	SAs
1		100						1		100					
2				50	50			2			100				

Influence of OQG on variance of vegetative levels with initial (1) functional compensation of parasympathetic activity (FkP) in female and male groups.

Vegetative disorientation in the WD (in%)								Vegetative disorientation in MD (in %)							
№	PAs	PAe	FkP	VE	FkS	SAe	SAs	№	PAs	PAe	FkP	VE	FkS	SAe	SAs
1			100					1			100				
2		9	53	28		10		2		20	40	40			

Influence of OQG on variance of vegetative levels at initial vegetative equilibrium (VE) in female and male groups.

Vegetative disorientation in the WD (in%)								Vegetative disorientation in MD (in %)							
№	PAs	PAe	FkP	VE	FkS	SAe	SAs	№	PAs	PAe	FkP	VE	FkS	SAe	SAs
1				100				1				100			
2			16,6	67,8	16,6			2		33,3		66,6			

Influence of OQG on variance of vegetative levels with initial (1) functional compensation of sympathetic activity (FkS) in female and male groups.

Vegetative disorientation in the WD (in%)								Vegetative disorientation in MD (in %)							
№	PAs	PAe	FkP	VE	FkS	SAe	SAs	№	PAs	PAe	FkP	VE	FkS	SAe	SAs
1					100			1					100		
2				100				2				66,6		33,3	

Influence of OQG on variance of vegetative levels with initial (1) expressed sympathetic activity (SA-e) in female and male groups.

Vegetative disorientation in the WD (in%)								Vegetative disorientation in MD (in %)							
№	PAs	PAe	FkP	VE	FkS	SAe	SAs	№	PAs	PAe	FkP	VE	FkS	SAe	SAs
1								1						100	
2								2		50			50		

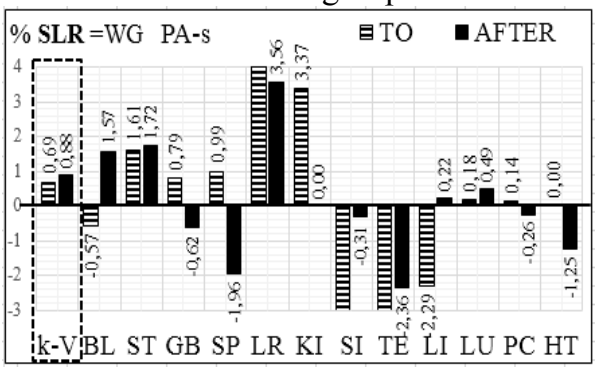
Influence of OQG on variance of vegetative levels with initial (1) significant sympathetic activity (SA-s) in female and male groups.

Vegetative disorientation in the WD (in%)								Vegetative disorientation in MD (in %)							
№	PAs	PAe	FkP	VE	FkS	SAe	SAs	№	PAs	PAe	FkP	VE	FkS	SAe	SAs
1							100	1							100
2				100				2				100			

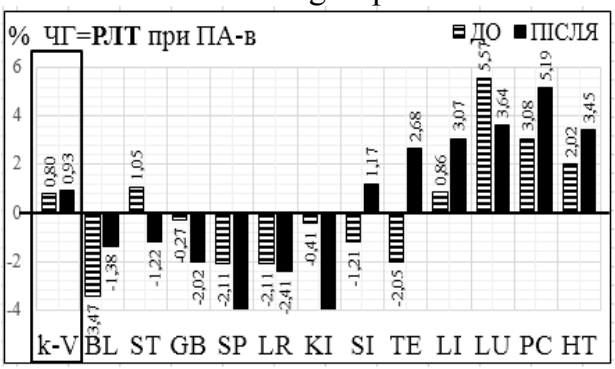
2. THE INFLUENCE OF OQG ON VEGETATIVE ACTIVITY AND SYSTEM DEPENDENCE

2.1. With initial significant parasympathetic activity. Influence of OQG in the female gro-up *positively* affects the vegetative homeostasis, translating it into a higher level - PA-e (fig.2.1, table 2.1). In this case the fuctional systems are in a state of interconnected dynamic-functional compensation ...

Women's group



Men's group



Influence of OQG on vegetative levels and systemic dependence in PA-s

Fig.2.1

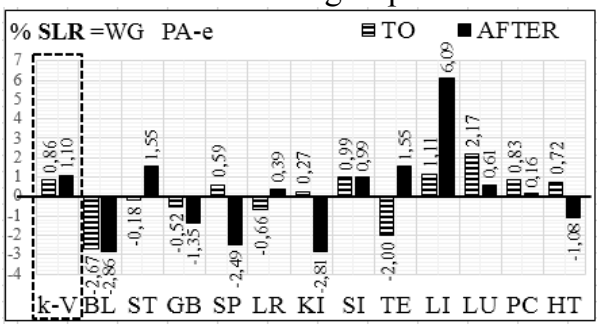
Table 2.1

Systemic dependence in the female group at the initial PA-s

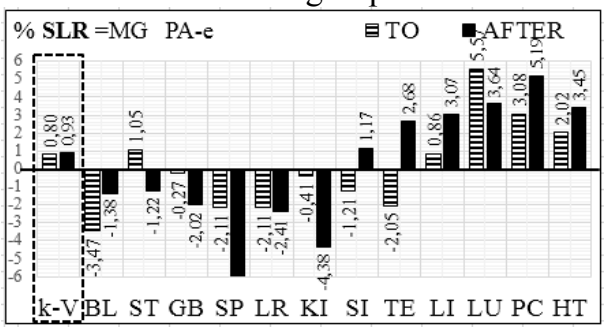
OQG	**k-BP**	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST
to	**0,69**	9,00	7,85	7,55	6,40	3,25	5,00	11,7	12,0	11,1	10,1	7,15	8,95
after	**0,88**	8,75	7,35	6,20	9,20	3,05	5,75	8,65	11,5	10,9	11,8	6,80	10,2

2.2. With initial pronounced parasympathetic activity. The impact of the OQG *positively* affects the vegetative homeostasis, translating it into a higher functional level - into the zone of permissible vegetative equilibrium (fig.2.2, tab.2.2). In this case, the fuctional systems are in a state of interdependent functional compensation ...

Women's group



Men's group



Influence of OQG on vegetative levels and systemic dependence in PA-e

Fig.2.2

Table 2.2

Systemic dependence in the female group at the initial PA-e

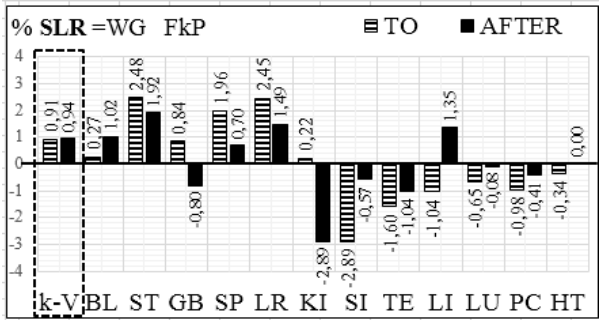
OQG	**k-BP**	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST
to	**0,86**	11,0	8,55	8,30	11,9	4,85	8,65	11,3	6,75	8,00	8,00	5,75	7,05
after	**1,11**	8,85	7,85	6,35	10,6	7,05	11,6	8,10	8,30	8,05	7,10	6,05	10,0

Systemic dependence in the male group at the initial PA-e

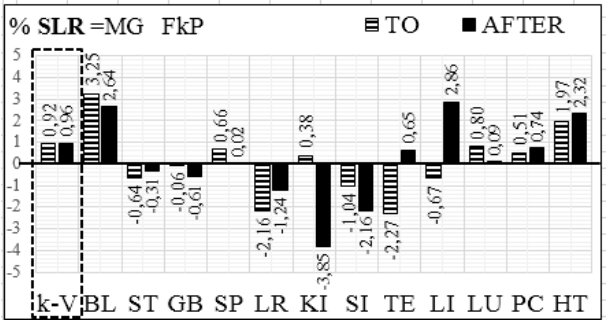
OQG	**k-BP**	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST
to	**0,80**	14,40	10,80	9,60	9,60	4,80	8,40	8,40	5,30	7,20	7,20	6,00	8,40
after	**0,93**	11,90	12,90	11,00	10,80	8,20	8,60	4,30	5,40	6,50	8,60	5,40	6,50

2.3. At initial compensation of parasympathetic activity. The impact of the OQG *positively* affects the vegetative homeostasis, translating it into a higher functional level - mainly in the zone of vegetative equilibrium (fig.2.3, tab.2.4). In this case, the fuctional systems are in a state of interconnected dynamic-functional compensation ...

Women's group



Men's group



Influence of OQG on vegetative levels and systemic dependence in FkS

Fig.2.3

Table 2.3

Systemic dependence in the female group at the initial FkS

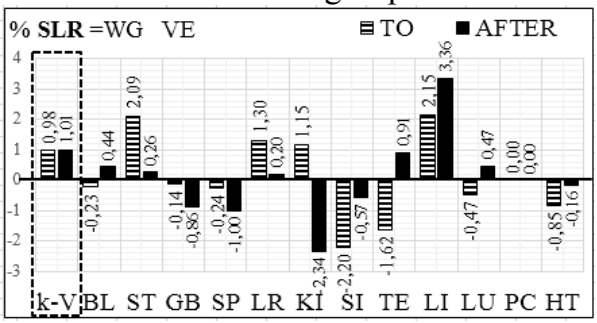
OQG	**k-BP**	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST
to	**0,91**	8,05	6,63	7,13	7,91	5,25	6,25	12,66	9,97	7,94	11,17	7,20	9,82
after	**0,94**	8,04	7,18	7,49	8,92	4,37	6,87	11,49	9,40	7,97	11,22	6,61	10,37

Systemic dependence in the male group at the initial FkS

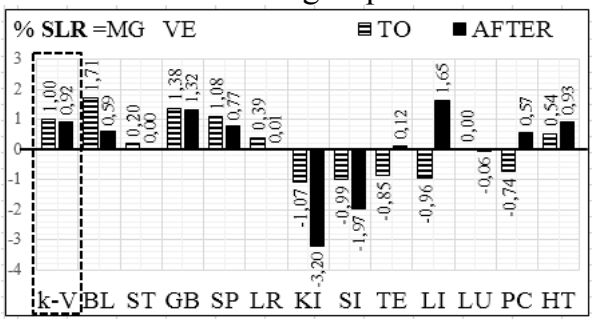
OQG	**k-BP**	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST
to	**0,92**	9,62	8,22	9,54	9,76	4,58	6,62	11,36	5,24	8,10	14,14	6,20	6,58
after	**0,96**	8,34	8,44	9,86	7,34	6,16	8,38	10,82	6,56	7,02	12,84	6,80	7,40

2.4. At the initial vegetative equilibrium. Influence of RLT is *n e u t r a l* in relation to functional-vegetative homeostasis (fig.2.4, tab.2.4). In this case functional systems in the state of interrelated dynamically-functional compensation ...

Women's group



Men's group



Influence of OQG on vegetative levels and systemic dependence in VE

Fig.2.4

Table 2.4

Systemic dependence in the female group at the initial VE

OQG	**k-BP**	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST
to	**0,98**	8,23	7,68	6,62	8,60	5,23	9,68	10,25	8,82	8,87	10,42	6,12	9,43
after	**1,01**	8,72	7,63	7,28	8,93	6,42	8,88	9,60	8,12	8,53	10,65	6,55	8,72

Systemic dependence in the male group at the initial VE

OQG	**k-BP**	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST
to	**1,00**	8,77	6,87	8,10	9,80	6,00	6,33	11,77	7,90	6,53	12,60	7,73	7,53
after	**0,92**	8,07	8,27	8,47	7,53	5,63	7,17	11,57	7,93	7,67	10,80	8,83	8,07

2.5. At the initial functional compensation of sympathetic activity. The impact of the OQG *p o s i t i v e l y* affects the vegetative homeostasis, mainly translating it to the lo-wer functional level - into the zone of vegetative equilibrium (fig.2.5, tab.2.5). In this case, the functional systems are in a state of interdependent dynamic-functional compensation

Table 2.5

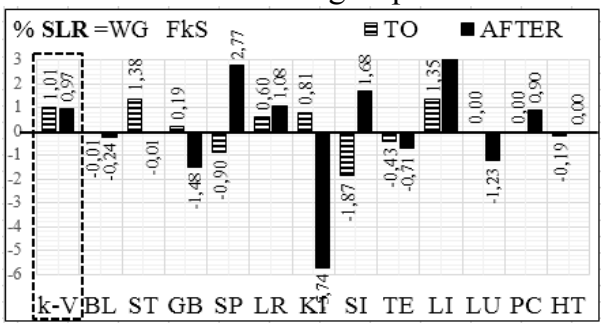
Systemic dependence in the female group at the initial PA-s

OQG	**k-BP**	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST
to	**1,01**	8,72	7,63	7,28	8,93	6,42	8,88	9,60	8,12	8,53	10,65	6,55	8,72
after	**0,97**	6,90	8,60	7,53	11,30	4,70	9,93	13,57	9,00	5,13	9,73	5,93	7,70

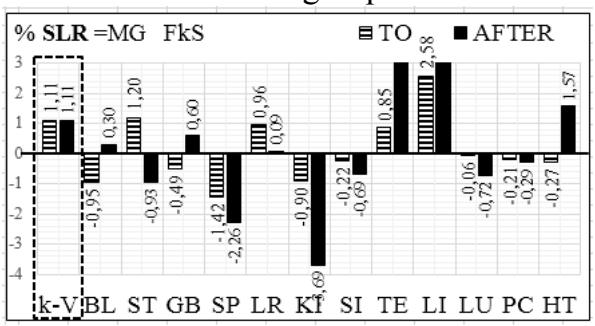
Systemic dependence in the male group at the initial PA-s

OQG	**k-BP**	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST
to	**1,11**	8,63	7,40	7,20	10,57	7,80	10,10	9,07	8,47	6,70	9,70	5,77	8,53
after	**1,12**	7,40	7,30	9,10	8,80	9,33	9,10	8,33	8,00	7,17	10,50	8,10	6,77

Women's group



Men's group



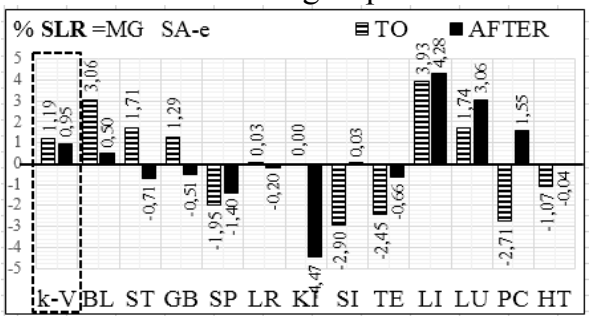
Influence of OQG on vegetative levels and systemic dependence in FkS

Fig.2.5

2.6. With initial pronounced sympathetic activity. The impact of the OQG in the male group positively affects the vegetative homeostasis, translating it into lower functional levels (fig.2.6, tab.2.6). In this case, the fuctional systems are in a state of interconnected dynamic-functional compensation ...

Women's group

Men's group



Influence of OQG on vegetative levels and systemic dependence in SA-e

Fig.2.6

Table 2.6

Systemic dependence in the male group at the initial PA-s

OQG	**k-BP**	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST
to	**1,20**	10,55	4,90	6,40	7,90	4,40	11,45	8,55	7,55	7,60	13,95	7,65	9,05
after	**0,96**	11,30	9,25	7,40	9,65	4,75	9,80	9,20	7,60	6,40	10,70	6,90	7,00

2.7. At the initial significant sympathetic activity. The impact of the OQG *p o s i t i- v e l y* affects the vegetative homeostasis, translating it into significantly lower levels of functional activity - to the state of vegetative equilibrium (fig.2.7, tab.2.7). In this case, the fuctional systems are in a state of interdependent dynamically-functional compensation ...

Table 2.3

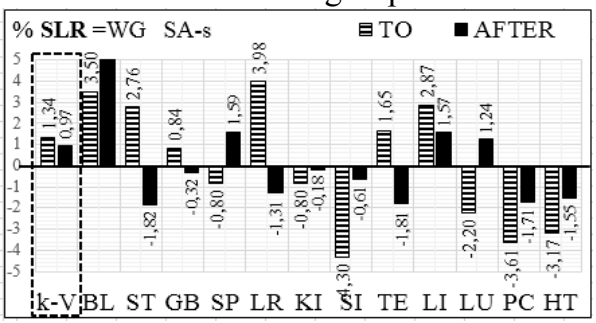
Systemic dependence in the female group at the initial PA-s

OQG	**k-BP**	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST
to	**1,34**	6,5	4,0	4,3	6,5	8,6	10,4	9,70	11,5	6,80	14,4	7,20	10,1
after	**0,97**	9,50	5,90	5,90	8,90	3,60	7,10	12,4	6,50	10,7	16,6	7,10	5,90

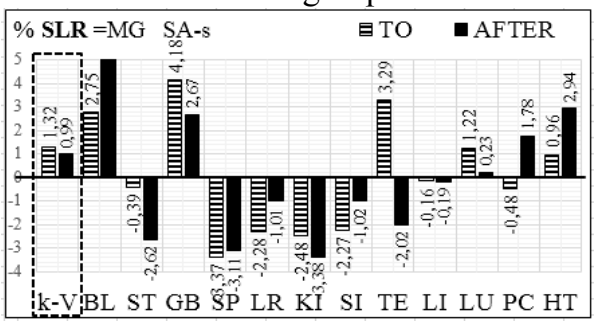
Systemic dependence in the male group at the initial PA-s

OQG	**k-BP**	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST
to	**1,31**	10,	7,10	8,50	8,50	10,20	7,10	7,10	5,10	5,10	13,60	10,50	6,80
after	**0,99**	8,5	9,50	10,50	8,50	3,40	5,10	7,50	6,80	7,50	17,60	10,20	5,10

Women's group



Men's group



Influence of OQG on vegetative levels and systemic dependence in SA-s

Fig.2.3

Thus, irrespective of the topographic zone of laser irradiation, OQG with a variety of therapeutic pathologies has a specific effect on the functional-vegetative homeostasis of sick children (translates initial parasympathetic inhibition to a higher vegetative level, and sympathetic excitation to a lower one). The conclusion is drawn about its normalizing functional and vegetative orientation, which is more pronounced in cases of significant and pronounced sympathetic-vegetative superiority. At the same time, the analysis carried out shows the absence of sexual features of functional-vegetative reactions to the influence of a non-focussed laser in the conditions of a physiotherapeutic hospital. Under all conditions, the observation of the OQG causes a normalizing effect at different initial levels of parasympathetic and sympathetic activity. It is worth noting the practical absence of sexual dependence of the impact of the RLT of various topographical zones in the female and male groups of aftershocks.

Conclusions

1. For the first time, an experimental study of functional and vegetative efficiency of OQG was conducted. It establishes its normalizing functional-ventual orientation, which is more pronounced in cases of significant and pronounced advantage of sympathetic activity.

2. Functional-vegetative diagnostics by the method of V.Makats is easy to use, gives comparable results and can be used in stationary, ambulatory and field conditions.

USED BOOKS

1.Василенко А.М., Брук Б.И., Усупбекова Б.Ш., Розанов А.Л. Электропунктурная диагностика как метод мониторинга пациентов с головной болью, направленный на повышение эффективности рефлексотерапии (Сборник научных трудов конгресса "Традиционная медицина", 2007) // М.: 2007. - С.279-280.

2.Вейн А.М. Вегетативные расстройства: Клиника, лечение, диагностика (под ред. А.М.Вейна) // М, МИА - 2000-752 с.

3.Єрмішев О.В., Петрук Р.В., Овчинникова Ю.Ю., Костюк В.В. Функціональне здоров'я дітей як екологічний біоіндикатор України (Вінницька, Львівська, Чернігівська області) - Вінниця, Нілан-ЛТД, 2017, 226С.ISBN 978-966-924-510-6

4.Макац В., Нагайчук В., Єрмішев О., Основи функціональної вегетології і фізіотерапії) – Україна, Вінниця, 2017, 254 С. ISBN 978-966-924-529-8

5.Кушнир С.М. Антонова И.К. Адаптация к физическим нагрузкам у подростков с различными кардиоваскулярными вариантами синдрома вегетативной дистонии // Российский вестник перинатологии и педиатрии. 201?03.- № 5. - С.36.

6.Makats V., Makats E., Unknown Chinese acupuncture (reality, errors, problems). Vol. I – Ukraine, Vinnytsia, 2016, P. 276 ISBN 978-966-2932-80-5 (*на українській і англійській мовах*).

7.Makats V., Makats E., Unknown Chinese acupuncture (biophysical atlas of systemic dependency). Vol. II – Ukraine, Vinnytsia, 2016, P.204, ISBN 978-966-2932-80-5 (*на українській і англійській мовах*).

8.Makats V., Nagaychuk V., Makats E., Yermyshev O. Unknown Chinese acupuncture (problems of vegetative pathogenesis). Vol. IV – Vinnytsia: “Naukova Initsiatyva”, Editorial office “Nilan Ltd.”, 2017, 286 P. ISBN 978-966-924-583-0 (*на українській і англійській мовах*).

9.Makats V., Nahaychuk V., Makats E., Unknown Chinese acupuncture (problems of functional vegetales). Vol. III – Ukraine, Vinnytsia, 2017, P.204, ISBN 978-966-2932-80-5 (*на українській і англійській мовах*).

10.8.Єрмішев О.В. Розфокусована лазеротерапія як розділ реабілітаційної вегетології // Наукові записки Тернопільського національного педагогічного університету імені Володимира Гнатюка. Серія: біологія. № 2(73), 2018 рік, 202-208 с.