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REPRINT [4] with additional illustrative material


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LEVELS OF FUNCTIONAL-VEGETATIVE HOMEOSTASIS AS A CRITERION OF BURN INJURY

(INFORMATION 2)

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Summary. *The paper presents the results of functional-vegetative diagnostics using the method of V.G.Makats, with a burn disease in the pathogenesis of which the functional state of VNS is not taken into account. The research included 141 patients aged 18 to 80 years, randomized according to the severity index of lesions from 60 units, 90 units and more. Patients underwent standard infusion-transfusion therapy, local treatment in a wet chamber, early necrectomy and xenoplasty. The vegetative pathogenesis was controlled by the levels of the functional-vegetative homeostasis k-V (FVD was performed from 10:00 to 12:00 on the 1,3,7,14,21 and the 50th day of stay in the hospital). Parasympathetic dynamics of vegetative homeostasis in the pathogenesis of the acute period of burn disease is shown. There is a positive conclusion about FVD, which allows you to monitor the course of the disease at the functional-vegetative level and outstrips the capabilities of modern diagnostic tools.*
Key words: functional-vegetative homeostasis, vegetative diagnostics (according to the method of V.G. Makats), burn disease.

Реферат. *Представлені результати функціонально-вегетативної діагностики (ФЗД) за методом В.Г.Макаца при опікової хвороби, в патогенезі якої не враховують функціональний стан ВНС. Під наглядом знаходилося 141 хворий у віці від 18 до 80 років, рандомізовані за індексом тяжкості ураження від 60 од., 90 од. і більше. Хворим проводили стандартну інфузійно-трансфузійну терапії, місцеве лікування в умовах вологої камери, ранню некректомія і ксенопластику. Вегетативний патогенез контролювали за рівнями функціонально-вегетативного гомеостазу k-V (ФЗД проводили з 1000 до 1200 на 1,3,7,14,21 і 50-й день перебування в стаціонарі). Показана парасимпатична динаміка вегетативного гомеостазу в патогенезі гострого періоду опікової хвороби. Робиться позитивний висновок про ФВД, яка дозволяє контролювати перебіг хвороби на функціонально-вегетативному рівні і випереджає можливості сучасних засобів діагностики.*
Ключові слова: функціонально-вегетативний гомеостаз, вегетативна діагностика за методом В.Г Макацу, опікова хвороба.

Реферат. *Представлены результаты функционально-вегетативной диагностики (ФВД) по методу В.Г.Макаца при ожоговой болезни, в патогенезе которой не учитывают функциональное состояние ВНС. Под наблюдением находились 141 больных в возрасте от 18 до 80 лет, рандомизированых по индексу тяжести поражения от 60 ед., 90 ед. и больше. Больным проводили стандартную инфузионно-трансфузионную терапию, местное лечение в условиях влажной камеры, раннюю некрэктомию и ксенопластику. Вегетативный патогенез контролировали по уровням функционально-вегетативного гомеостаза k-V (ФВД проводили с 10^{00} до 12^{00} на 1,3,7,14,21 и 50-й день пребывания в стационаре). Показана парасимпатическая динамика вегетативного гомеостаза в патогенезе острого периода ожоговой болезни. Делается положительный вывод о ФВД, которая позволяет контролировать течение болезни на функционально-вегетативном уровне и опережает возможности современных средств диагностики.*
Ключевые слова: функционально-вегетативный гомеостаз, вегетативная диагностика по методу В.Г Макаца, ожоговая болезнь.

Introduction. Evaluation of the integral vegetative status allows identifying the development of pathology at the functional level and outstrips the capabilities of modern diagnostic tools [1]. It is well known that the flow of information from the internal organs into the epidermal functionally active zones (FAZ) is genetically conditioned (the skin and nervous system originate from the ectoderm). It is well known that the flow of information from the internal organs into the epidermal functionally active zones (FAZ) is genetically conditioned (skin and nervous system originate from the ectoderm).

On the other hand, the activity of external FAZ directly depends on the Earth's electromagnetic oscillations (Schumann resonances), which determine the external shaping rhythm. As a result of long-term studies of individual FAZ and the acupuncture system, functional-vegetative diagnostics (FVD), which combined the methodology of traditional Zhen-chiu therapy and modern concepts of vegetative homeostasis, were developed [2]. Burn injury is one of the most powerful stress irritants, in which vegetative homeostasis is severely disrupted. At the same time, numerous publications on various aspects of the pathogenesis of burn shock do not take into account the functional state of the VNS for burns and burn disease.

Objective: to increase the effectiveness of controlled rehabilitation of burn patients by applying FVD and subsequent correction of levels of vegetative homeostasis.

Materials and methods. In the burn department of Vinnytsia Regional Clinical Hospital. N.I. Pirogov was examined and treated 141 patients aged 18 to 80 years with an index of severity lesions (ISL) from 60 to 90 units. in the acute period of burn injury. The injured received standard infusion-transfusion therapy (local treatment of wounds in a wet chamber under a PVC film). All patients were operated on for 2-3 days after injury (early necrectomy, xenoplasty). FVD was performed from 1000 to 1200. All patients were randomized according to the severity of the trauma. In the 1st group there were 30 patients with ISL up to 60 units, in the second group - 90 patients with ISL up to 90 units, in the third group - 21 patients with ISL above 90 units. The consequences of the burn injury tracing were controlled by the levels of the coefficients of the functional-vegetative homeostasis k-V [2, 3].

Results and discussion.

1. **Vegetative levels with burn injury with (ISL) up to 60 units**. With a burn injury with ISL up to 60 units. (1 g.) During the clinical period (50 days), the following vegetative dynamics were noted:

• On the 1st day signs of "functional compensation of parasympathetic activity" develop (FcP, k-V = 0,91);

• on the third day signs of "marked parasympathetic activity (PA-in, k-V = 0,76) develop with a transition to the significant state on the 7th day (PA-s, k-V = 0,66);

• on the 14th and 21st days, there is an increase in signs of "pronounced" parasympathetic activity (PAe. from k-V = 0,72 to k-V = 0,80);

• On the 50th day of stay in the hospital signs of "functional compensation of parasympathetic activity" develop (FcP, k-V = 0,95).

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• on the 14th and 21st days, there is an increase in signs of "pronounced" parasympathetic activity (from k-V = 0,72 to k-V = 0,80);

• On the 50th day of stay in the hospital signs of "functional compensation of parasympathetic activity" develop (FcP, k-V = 0,95).

The data given in Table 1 indicate that for burns with ISL up to 60 units. At all stages of clinical care in burn patients, parasympathetic depression (from the initial level of k-V 0.91-FcP) increases, which on the 50th day normalizes at the level of vegetative equilibrium (k-V 0.95-BP). In this case, vegetative transformations are accompanied by severe

systemic disorders (Fig.1-5), which are accompanied by increasing inhibition of the KI channel and the growing activity of the SI channel.

Table 1. Dynamics of vegetative levels and systemic dependence in the 1-st group (n = 30)

Day	Activity of functional-vegetative systems in% (M±m)													
	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST	k-V	
1	8,10 *0,07*	8,90 *0,10*	10,0 *0,07*	7,00 *0,09*	9,10 *0,07*	8,40 *0,06*	8,00 *0,14*	8,00 *0,06*	9,30 *0,07*	9,50 *0,11*	6,30 *0,06*	7,20 *0,06*	0,91	FcP
3	7,80 *0,19*	7,60 *0,21*	8,90 *0,20*	5,10 *0,42*	6,30 *0,22*	6,40 *0,18*	12,9 *0,27*	8,00 *0,23*	11,7 *0,23*	10,7 *0,29*	7,30 *0,21*	7,30 *0,17*	0,76	PAe
7	8,90 *0,05*	8,50 *0,08*	9,10 *0,07*	5,00 *0,07*	4,50 *0,05*	6,30 *0,05*	11,6 *0,07*	9,40 *0,05*	12,8 *0,08*	10,4 *0,10*	7,30 *0,06*	6,20 *0,06*	0,66	PAs
14	9,10 *0,19*	8,70 *0,21*	9,70 *0,20*	5,50 *0,42*	5,50 *0,22*	5,70 *0,18*	10,8 *0,27*	8,00 *0,23*	11,6 *0,23*	9,70 *0,29*	8,30 *0,21*	7,21 *0,17*	0,72	PAe
21	9,80 *0,07*	9,50 *0,06*	8,80 *0,04*	4,90 *0,01*	3,30 *0,08*	5,80 *0,03*	9,30 *0,07*	8,90 *0,05*	9,20 *0,09*	10,6 *0,04*	11,7 *0,04*	8,00 *0,07*	0,80	PAe
50	11,7 *0,04*	11,6 *0,38*	11,4 *0,38*	10,1 *0,40*	12,8 *0,30*	14,3 *0,30*	5,70 *0,53*	5,00 *0,35*	5,90 *0,33*	5,40 *0,62*	3,40 *0,32*	2,70 *0,30*	0,95	FcP

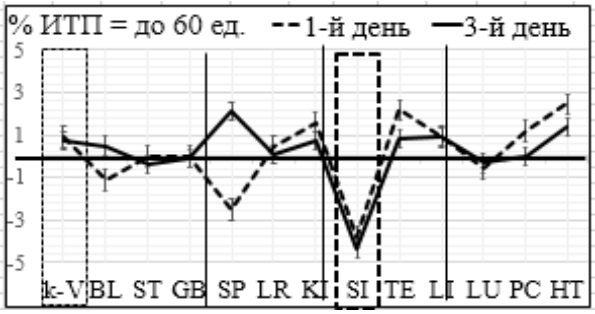

Fig.1 kV-1 (0,91-FcP) kV-3 (0,76-PAe)

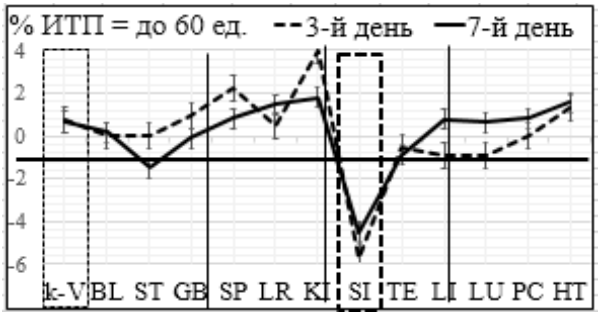

Fig.2 kV-3 (0,76-PAe) kV-7 (0,66-PAs)

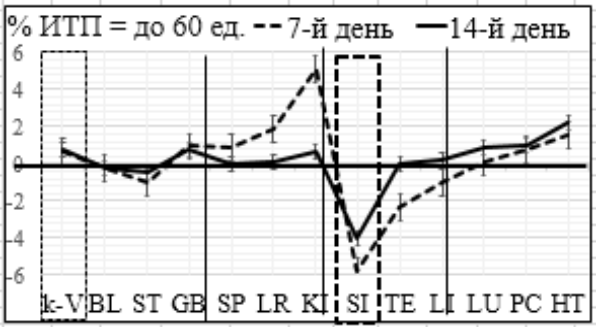

Fig.3 kV-7 (0,66-PAs) kV-14 (0,72-PAe)

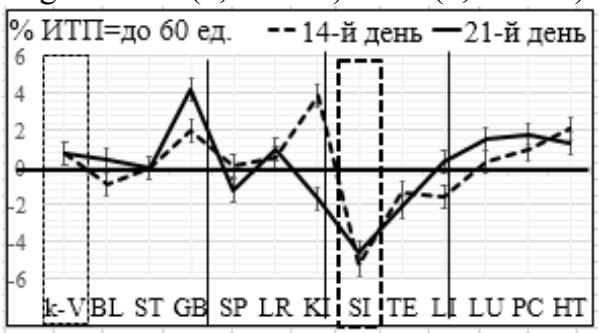

Fig.4 kV-14 (0,72-PAe) kV-21 (0,80-PAe)

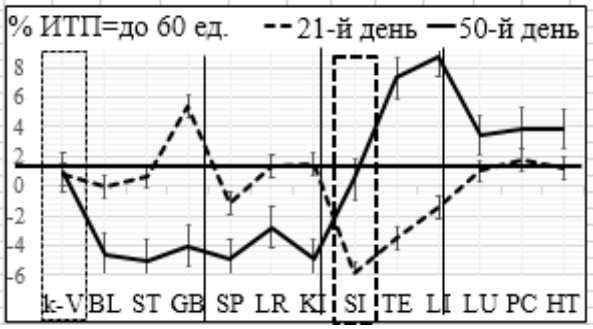

Fig.5 kV-21 (0,80-PAe) kV-50 (0,95-VE)

Fig.1-5 Dynamics of systemic activity with burn injury with ISL up to 60 units.
Note: k-V = vegetative level

2. Vegetative levels with burn injury with (ISL) up to 90 units. As in the 1 st group at all stages of clinical care burn patients with ISL up to 90 units. there was parasympathetic depression, accompanied by a significant systemic disorder in the form of the following dynamics:

• on the 1st day after the trauma there were all signs of pronounced parasympathetic superiority (PAe, k-V = 0,83), which on the third day passed into a significant (PAs, k-V = 0,69);

• on the 7th and 14th day there is an increase in signs of pronounced parasympathetic activity (PAe, from k-V = 0,78 to k-V = 0,84);

• on the 21st day the level of "expressed" parasympathetic activity decreases to "significant" (PAs, k-V = 0,76);

• On the 50th day of observation, parasympathetic depression slowly passes into the zone of "functional compensation of parasympathetic activity" (FcP, k-V = 0,87).

With burns with ISL up to 90 units. (Table 2) draws attention to the increase in parasympathetic depression (from k-V 0,83-PAv on the day of admission to k-V 0,87-FCF on the day of discharge). In this case, vegetative transformations are accompanied by systemic disorders (Fig. 6-10), which are accompanied by increasing inhibition of the KI channel (kidney) and the growing activity of the SI channel (small intestine).

Table 2. Dynamics of vegetative levels and systemic dependence in the 2nd group (n=90)

Day	Activity of functional-vegetative systems in% (M±m)													
	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST	k-V	
1	10,5 *0,07*	10,2 *0,10*	10,7 *0,07*	8,00 *0,09*	9,30 *0,07*	10,6 *0,06*	8,40 *0,14*	6,90 *0,06*	7,80 *0,07*	7,30 *0,11*	5,30 *0,06*	5,00 *0,06*	0,83	PAe
3	6,30 *0,19*	6,90 *0,21*	8,40 *0,20*	2,50 *0,42*	3,50 *0,22*	5,30 *0,18*	15,4 *0,27*	10,7 *0,23*	11,2 *0,23*	13,6 *0,29*	8,30 *0,21*	7,70 *0,17*	0,69	PAs
7	7,30 *0,05*	7,80 *0,08*	11,6 *0,07*	4,60 *0,07*	4,40 *0,05*	6,00 *0,05*	15,4 *0,07*	6,70 *0,05*	7,50 *0,08*	12,9 *0,10*	9,10 *0,06*	6,70 *0,06*	0,78	PAe
14	8,60 *0,19*	8,00 *0,21*	8,80 *0,20*	8,90 *0,42*	6,90 *0,22*	8,10 *0,18*	13,8 *0,27*	7,40 *0,23*	7,60 *0,23*	11,3 *0,29*	5,60 *0,21*	4,90 *0,17*	0,84	PAe
21	6,00 *0,07*	6,40 *0,06*	7,20 *0,04*	2,40 *0,01*	4,80 *0,08*	6,40 *0,03*	15,1 *0,07*	15,1 *0,05*	9,60 *0,09*	10,8 *0,04*	5,20 *0,04*	11,2 *0,07*	0,69	PAs
50	10,5 *0,04*	9,80 *0,38*	10,4 *0,38*	10,2 *0,40*	11,3 *0,30*	10,6 *0,30*	7,70 *0,53*	8,10 *0,35*	9,30 *0,33*	4,20 *0,62*	5,40 *0,32*	6,80 *0,30*	0,87	FcP

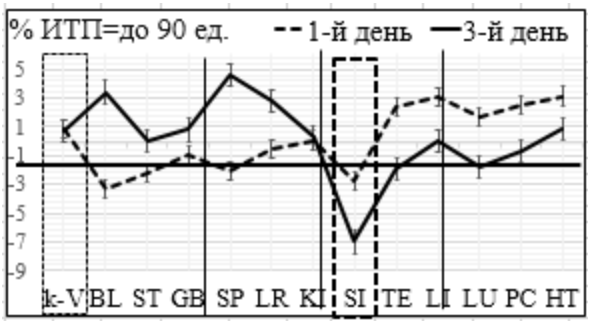

Fig.6 kV-1 (0,83- PAe) kV-3 (0,69-PAs)

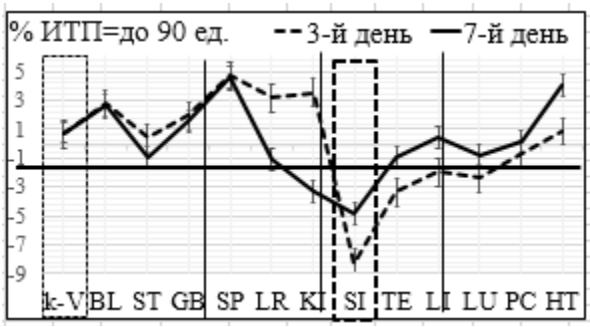

Fig.7 kV-3 (,69-PAs) kV-7 (0,78-PAe)

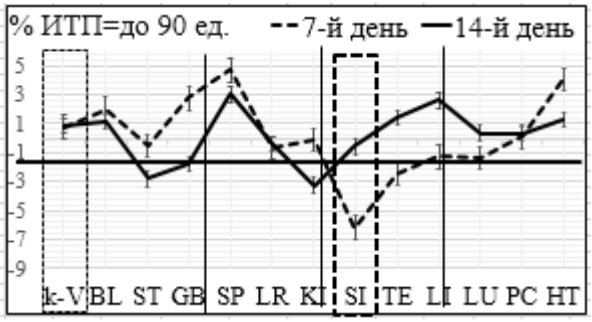

Fig.8 kV-7 (0,78- PAe) kV-14 (0,84-PAe)

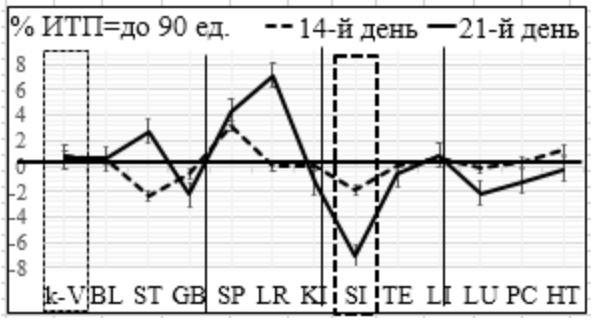

Fig.9 kV-14 (0,84-PAe) kV-21 (0,69-PAs)

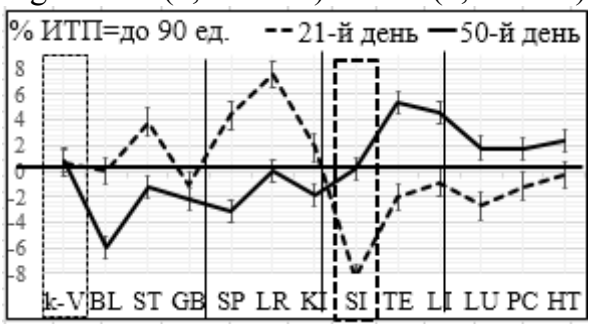

Fig.10 kV-21(0,69-PAs) kV-50(0,87-FcP)

Fig.6-10 Dynamics of systemic activity with burn injury with ISL up to 90 units.
Note: k-V = vegetative level

3. Vegetative levels for burn injury with ISL > 90 units. In this group of patients (Table 3), at all stages of treatment, parasympathetic depression was observed, accompanied by a significant systemic disorder in the form of the following dynamics:

• on the 1st day, all signs of functional compensation of parasympathetic activity were registered (FcP, k-V = 0.91);

• at the 3rd and 7th day, manifestations of a pronounced parasympathetic advantage increased (PAe, from k-V = 0.84 to k-V = 0.83);

• on the 14th day there appeared an abrupt predominance of pronounced sympathetic activity (SAe, k-V = 1,23.76);

• On the 21st and 50th day, the vegetative homeostasis levels returned to the zone of significant and expressed parasympathetic activity (within the range of k-V = 0.69-0.76).

With burns with ISL > 90 units. (Table 3) draws attention to the stable state of parasympathetic depression (from k-V 0.91-FCP on the day of admission to k-V 0.76-PAV on the day of discharge). At the same time, vegetative transformations are accompanied by systemic disorders (fig.11-15), which are accompanied by non-standard activity of KI (on-the-spot) and SI (small intestine) channels. After discharge from the hospital, this group of burned reconvalescents needs outpatient (or sanatorium) health improvement - a functional correction of autonomic homeostasis.

Table 3. Dynamics of vegetative levels and systemic dependence in the 3rd group (n = 21)

Day	Activity of functional-vegetative systems in% (M±m)													
	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST	k-VG	
1	8,30 0,07	7,00 0,06	13,2 0,11	7,40 0,06	9,30 0,06	10,1 0,08	5,70 0,08	9,30 0,09	8,80 0,10	7,50 0,10	8,50 0,08	4,90 0,08	0,91	FcP
3	8,60 *0,19*	8,00 *0,21*	8,80 *0,20*	8,90 *0,42*	6,90 *0,22*	8,10 *0,18*	13,8 *0,27*	7,40 *0,23*	7,60 *0,23*	11,3 *0,29*	5,60 *0,21*	4,90 *0,17*	0,84	PAe
7	9,30 0,04	7,70 0,06	6,70 0,06	3,00 0,06	4,00 0,05	9,30 0,05	6,90 0,08	7,00 0,05	16,9 0,05	6,90 0,10	12,7 0,05	9,60 0,05	0,83	PAe
14	8,90	6,80	9,60	6,60	10,5	6,30	3,70	4,60	11,2	4,30	14,8	12,7	1,23	CAв

	0,04	0,38	0,38	0,40	0,30	0,30	0,53	0,35	0,33	0,62	0,32	0,30		
21	17,8 0,07	8,20 0,05	10,9 0,06	2,50 0,07	2,30 0,08	5,90 0,06	7,60 0,09	5,80 0,09	8,90 0,06	8,90 0,15	12,0 0,08	9,30 0,08	0,69	PAs
50	10,9 0,03	9,40 0,39	9,30 0,35	9,20 0,43	8,30 0,30	8,60 0,32	8,10 0,51	9,20 0,32	9,30 0,60	4,20 0,28	5,40 0,34	6,80 0,32	0,76	PAe

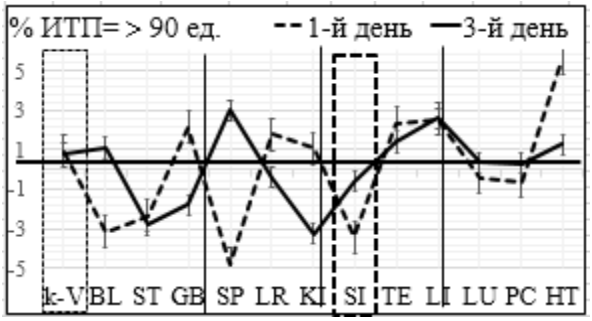

Fig.11 kV-1 (0.91- FcP) kV-3 (0,84-PAe)

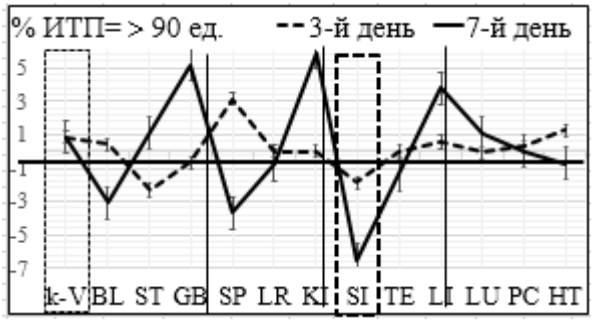

Fig.12 kV-3 0,84-PAe) kV-7 (0,83-PAe)

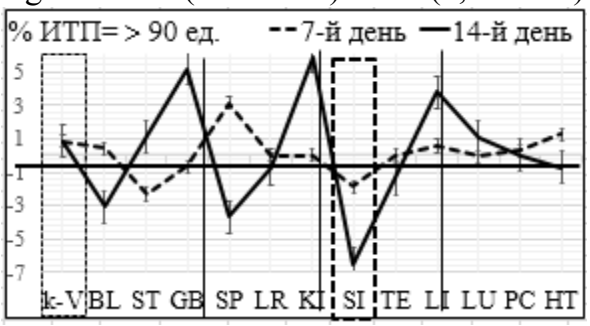

Fig.13 kV-7 (0,83-PAe) kV-14(0,84-PAe)

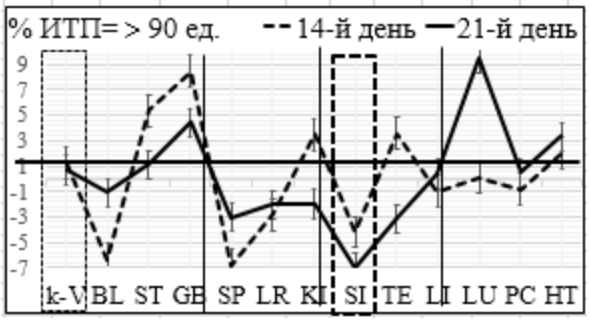

Fig.14 kV-14 (0,84-PAe) kV-21(0,69-PAs)

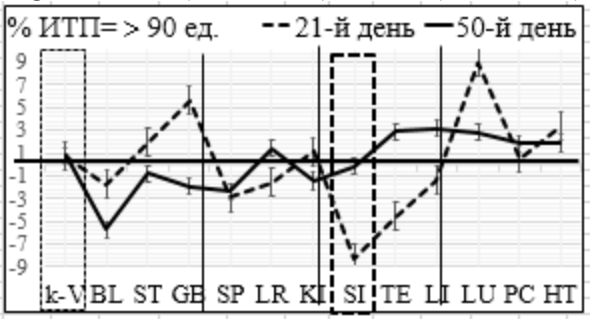

Fig.15 kV-21(0,69-PAs)kV-50(0,76- PAe)

Fig.11-15 Dynamics of systemic activity with burn injury with ISL > 90 units.
Note: k-V = vegetative level

Attention is drawn to the stable state of parasympathetic depression (from k-V 0,91-FcP on the day of admission to k-V 0,76 - PAe on the day of discharge). In this case, vegetative transformations are accompanied by systemic disorders, which are accompanied by non-standard activity of the KI and SI channels. After discharge from the hospital, this group of burned reconvalescents needs outpatient (or sanatorium) health improvement - a functional correction of autonomic homeostasis.

CONCLUSIONS

1. The FVD procedure is easy to use, it allows to control the vegetative pathogenesis of the burn disease and is allowed for use in stationary, outpatient and field conditions.

2. The most intense period of adaptation of the organism to thermal trauma is 7-14 days (the maximum imbalance of parasympathetic and sympathetic activity of the ANS).

3. Burn trauma leaves behind long systemic disorders, the consequences of which require functional-vegetative rehabilitation.

4. The earlier normalization of vegetative homeostasis in patients with burn injury revealed by FVD testifies to the advisability of tactics of early surgical treatment using lyophilized and bioactivated xenodermotransplants.
5. The use of HPD in case of burn injury is a promising area.

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