NAGAJCHUK V. I.

FUNCTIONAL DIAGNOSTICS OF FEVETATIVE DISORDERS AS THE MEASURE FOR THE ASSESSMENT OF PATIENTS WITH THERMAL INJURIES

(INFORMATION 1)

Expert of the highest level of NAS of Ukraine, MD, associate professor of the chair of gen-eral surgery
(Vinnytsia state university named after Pirogov M.I., Ukraine)

The research introduces the results of diagnostics of the functional state of the vegetative nervous system (VNS) of burn patients with the index of severity from 60 to 90 points.

Key words: diagnostics, vegetative nervous system, power-informational system, burn, burn injury.

В роботі представлені результати діагностики функціонального стану вегетативної нервової системи обпечених з індексом тяжкості ураження від 60 до 90 од.

Ключові слова: діагностика, вегетативна нервова система, енергоінформаційна система, опік, опікова хвороба.

В работе представлены результаты диагностики функционального состояния вегетативной нервной системы обожженных с индексом тяжести поражения от 60 до 90 ед.

Ключевые слова: диагностика, вегетативная нервная система, энергоинформационное система, ожог, ожоговая болезнь.

Introduction

The assessment of the vegetative homeostasis (VH) allows identifying the pathology on the functional level before its appearance on the physical one. This approach proves to benefit treatment faster than other contemporary means for diagnostics [1].

The reflection of internal information into the epidermal biologically active zones has been genetically conditioned, as the skin and the nervous system derive from the ectoderm, which allows to use the method of diagnostics for the assessment of the functional state and the activity of internal organs and systems [2]. The elaborated method of functional diagnostics of the vegetative disorders is based on the following principle positions: a) the received indices of the bioelectric activity of biologically active zones (BAZ) should be viewed from the position of the assessment of the activity of the sympathetic and parasympathetic divisions of the vegetative nervous system (VNS), that sustain the state of activation or oppression of the functional activity of the dependent organs and systems; b) the parasympathetic and sympathetic divisions of VNS, and the dependent on them cholinergic and adrenergic systems in the organism, interact according to the general law YIN-YANG of the Eastern school of the therapeutic philosophy; c) the functional setting of the organs of the YANG system is active and catabolic action, while the organs of the YIN system – organs of patience and anabolic action; d) dynamic-stable correlation of the activity of Yin and YANG states associates with the dynamic stability of the VNS, i.e. with the state of balance of the interdependent activity of its sympathetic and parasympathetic divisions; e) the prevalence of YANG over YIN testifies to the disorder of the vegetative homeostasis (VH) with the presence of excitation of the sympathetic division; f) the prevalence of YIN over YANG testifies to the disorder of the VH with the presence of excitation of the parasympathetic division. Both divisions of the VNS function antagonistically, and at the expense of the double innervation of the majority of the internal organs, sustain the stability of the dynamic equilibrium of the appropriate functions.

The studies of the vegetative nervous system allowed to identify its basic functions: trophotropic, which is targeted to maintain the dynamic stability of the internal environ-

ment of the organism, its biophysical, biochemical, enzymatic, humoral and other constants; b) ergotropic, which is targeted to provide vegetative-metabolic maintenance of various forms of the adaptive behavior, mental and physical activity, realization of biological motivations in relation to the volatile conditions of the external environment. At the same time, the sympathetic nervous system (SNS) is mainly activated during the realization of the ergotropic function. It changes the standard conditions of the internal environment and organs with the regard to their functions, inhibits anabolic processes and activates the catabolic ones. The parasympathetic nervous system (PNS) is activated during the realization of trophotropic function, which is targeted to maintain the homeostatic equilibrium, stimulation of the anabolic processes and inhibition of the catabolic ones.

In opposition to the parasympathetic division, the sympathetic division of the VNS mostly depends on the central nervous system (CNS), the endocrine system and the processes that run on the periphery and in the visceral area. That is why its tonus is unstable and requires continuous adaptation-compensational responses. Such sympathetic-parasympathetic duality conditions the control and the regulation of excitation or oppression of the working organs and systems, and maintains the stability of their dynamic functional equilibrium in relation to the conditions of the external environment [3].

The burn injury is one of one of the most powerful stressors that initiate an immediate disturbance of the vegetative homeostasis. In addition, numerous publications on various aspects of the pathogenesis of the burn shock do not take into account the functional state of the VNS during the burns and the burn disease, which may be evidently connected with the adequate methods for diagnostics [4].

Research objective: to study the state of the vegetative nervous system of the burn patients.

Resources and methodology. We studied the functional state of the VNS in 30 burn patients with the index of injury from 60 to 90 points at the burn department of the Vinnytsia regional clinical hospital named after M.I. Pyrogov. The burn traumas were estimated as severe. The burn patients received the appropriate, at the inpatient department, transfusion therapy. The local treatment of the wounds in the conditions of wet chamber under polyvinylchloride films. All patients passed surgery on the 2-3 day after the injury. The surgery – initial elimination of skin necrosis and xenoplasty. In the process of treatment, the patients were under the clinical observation, and the generally-required laboratory surveillance was also conducted. The diagnostics of the patients were performed from 10 to12 hours. We analyzed the dynamics of the activity of the functional power-informational systems and on their basis performed the assessment of the coefficient of the vegetative homeostasis (CVH). This coefficient was further used for the assessment of the functional state of the VNS.

Results and Discussion

According to the Table 1 and the Figure 1 on the first day of the trauma the CVH was 0,91. The excitation was of the channels HT-PC (heart-pericardium) and TE-LI (lymphatic system-large intestine). Channels SI and GB (small intestine-gall bladder) were oppressed. The functional health of the patients was in the state of compensation of the parasympathetic activity.

The dynamics of activity of the power-informational systems of the burn patients with the injury severity from 60 to 90 points (n = 30).

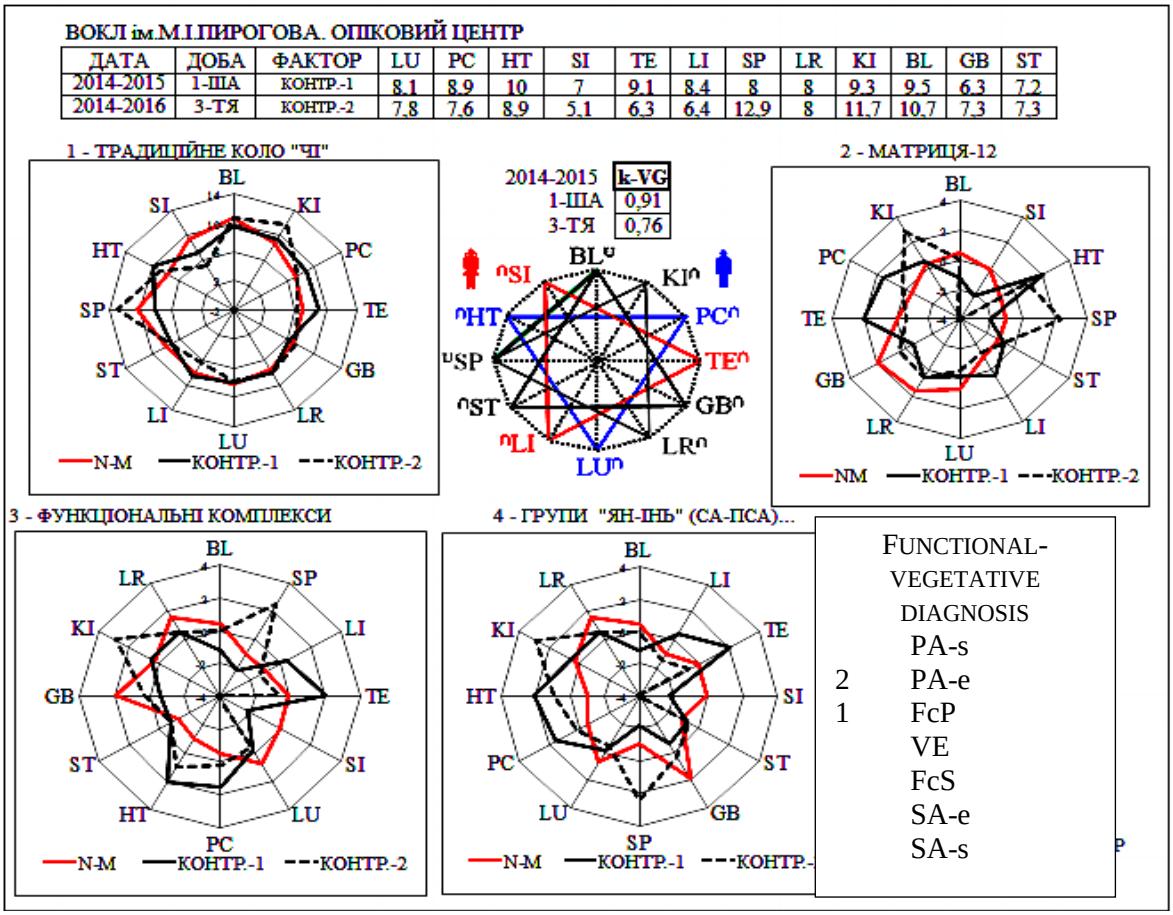
Table 1

The dynamics of activity of the power-informational systems of the burn patients with the injury severity from 60 to 90 points (n=30)

Доба	Активність функціонально-вегетативних систем в %												
	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST	KVG
1-ша	8,10	8,90	10,00	7,00	9,10	8,40	8,00	8,00	9,30	9,50	6,30	7,20	**0,91**
m+/-	0,08	0,06	0,04	0,03	0,08	0,03	0,07	0,08	0,09	0,04	0,06	0,07	
3-тя	7,80	7,60	8,90	5,10	6,30	6,40	12,90	8,00	11,70	10,70	7,30	7,30	**0,76**
m+/-	0,19	0,21	0,20	0,42	0,22	0,18	0,27	0,23	0,23	0,29	0,21	0,17	
7-ма	8,90	8,50	9,10	5,00	4,50	6,30	11,60	9,40	12,80	10,40	7,30	6,20	**0,66**
m+/-	0,16	0,21	0,23	0,32	0,22	0,18	0,17	0,13	0,23	0,25	0,22	0,11	
14-та	9,10	8,70	9,70	5,50	5,50	5,70	10,80	8,00	11,60	9,70	8,30	7,21	**0,72**
m+/-	0,05	0,08	0,07	0,07	0,05	0,05	0,07	0,05	0,08	0,10	0,06	0,18	
21-ша	9,80	9,50	8,80	4,90	3,30	5,80	9,30	8,90	9,20	10,60	11,70	8,00	**0,80**
m+/-	0,06	0,32	0,34	0,40	0,30	0,30	0,53	0,35	0,33	0,42	0,32	0,30	
50-та	11,70	11,60	11,40	10,10	12,80	14,30	5,70	5,00	5,90	5,40	3,40	2,70	**0,95**
m+/-	0,19	0,21	0,20	0,42	0,22	0,18	0,27	0,23	0,23	0,29	0,21	0,07	

Note. CVH – coefficient of vegetative homeostasis.

Day	Activity of the functional-vegetative systems in %												
	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST	**CVH**
1-st	8,10	8,90	10,0	7,00	9,10	8,40	8,00	8,00	9,30	9,50	6,30	7,20	**0,91**
3-rd	7,80	7,60	8,90	5,10	6,30	6,40	12,9	8,00	11,7	10,7	7,30	7,30	**0,76**



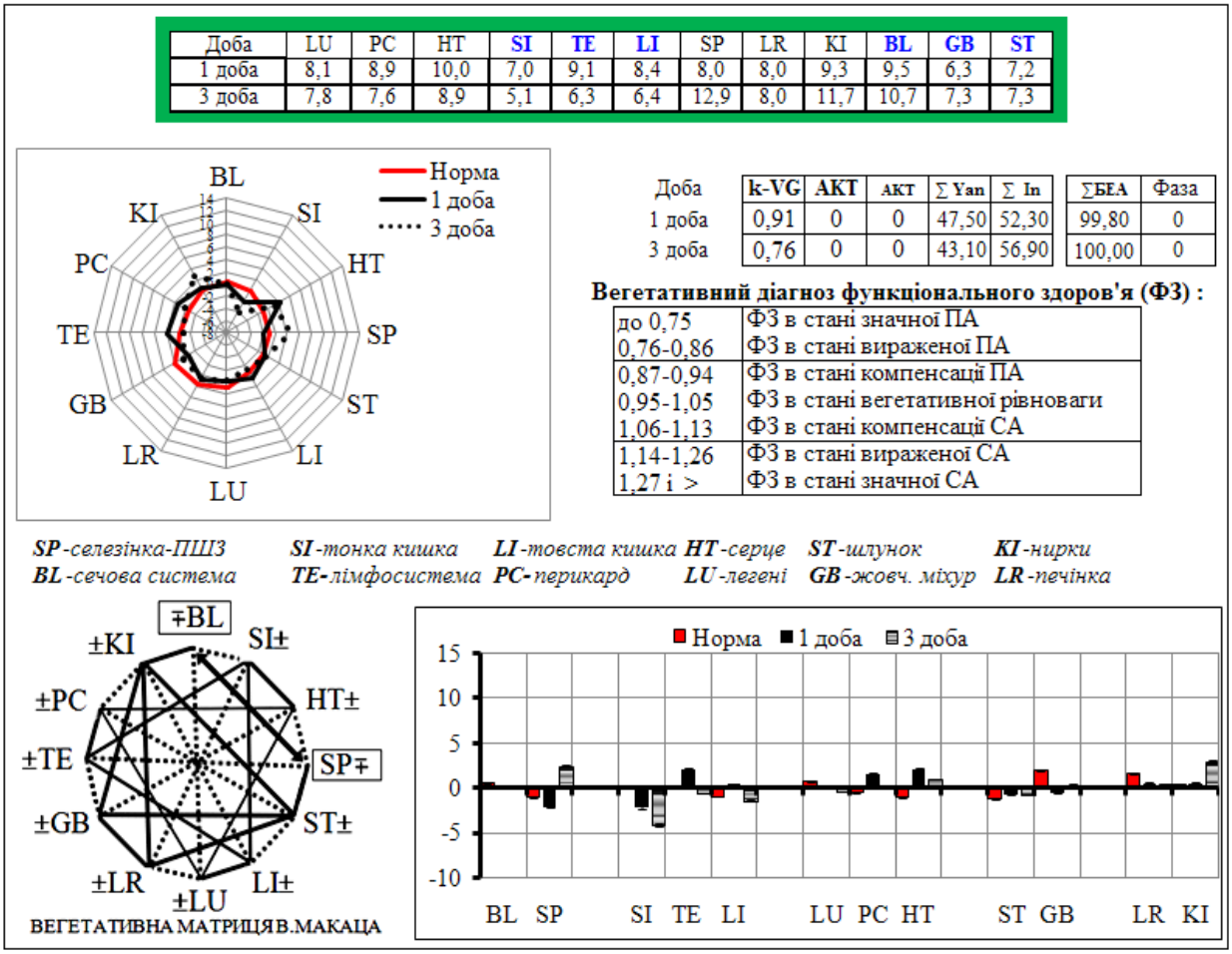


Fig. 1. Functional state of the vegetative nervous system of the burn patients with the index of injury severity from 60 to 90 points on the 1-3 day (n=30).

On the third day the CVH was equal to 0,76, which testified to the expressed parasympathetic activity. At the same time the channels SP (spleen) and KI (kidneys) were excited, while SI (small intestine) was oppressed.

On the seventh day (fig. 2) the following channels were excited PC-KI-HT-SP (pericardium-kidneys-heart-spleen), while the oppressed ones were SI-GB-TE (small intestine-gall bladder-lymphatic system). The CVH was 0,66, which testifies to the significant parasympathetic activity.

Day	Activity of the functional-vegetative systems in %												
	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST	**CVH**
1-st	8,10	8,90	10,0	7,00	9,10	8,40	8,00	8,00	9,30	9,50	6,30	7,20	**0,91**
7-th	8,90	8,50	9,10	5,00	4,50	6,30	11,6	9,40	12,8	10,4	7,30	6,20	**0,76**

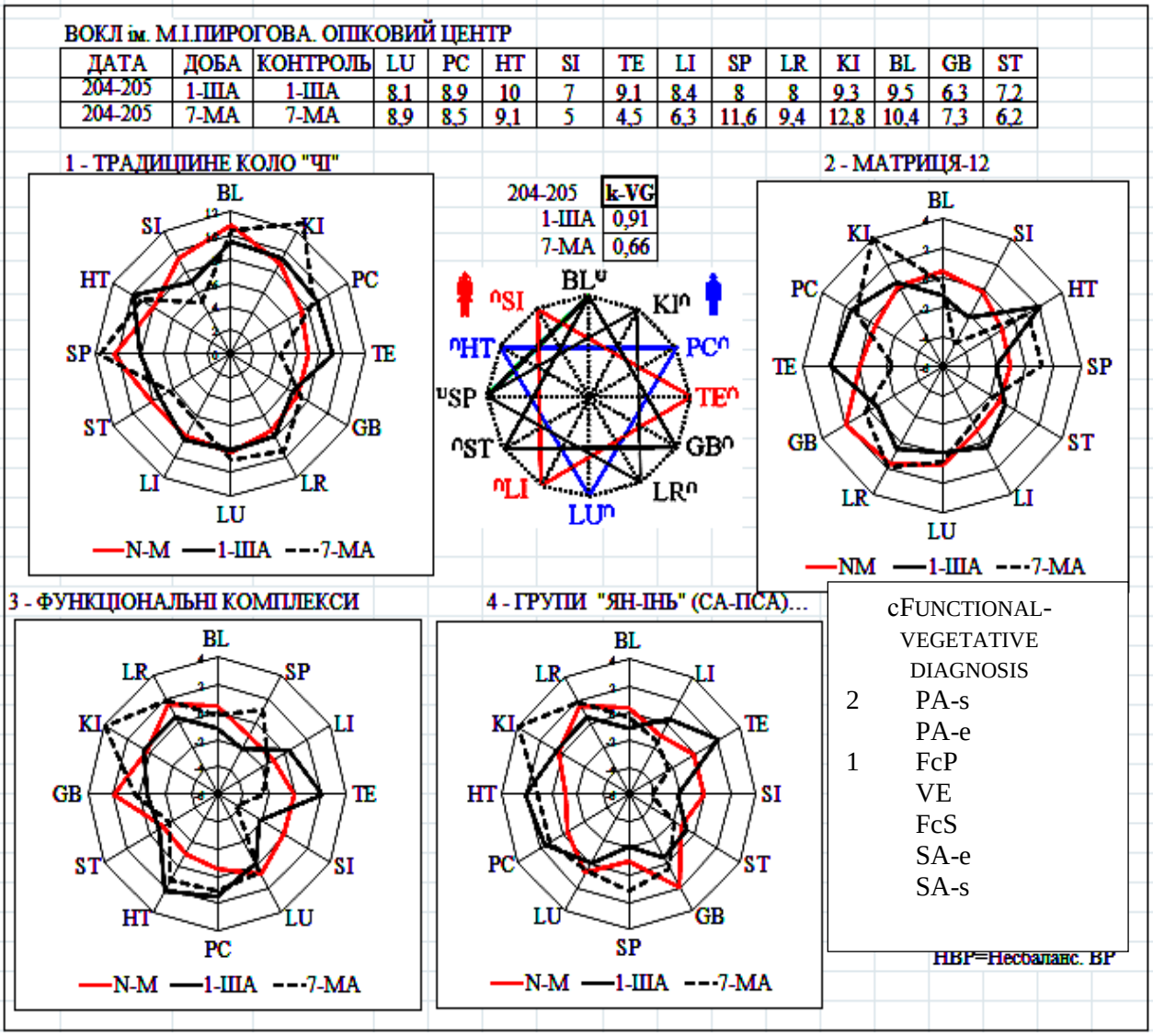


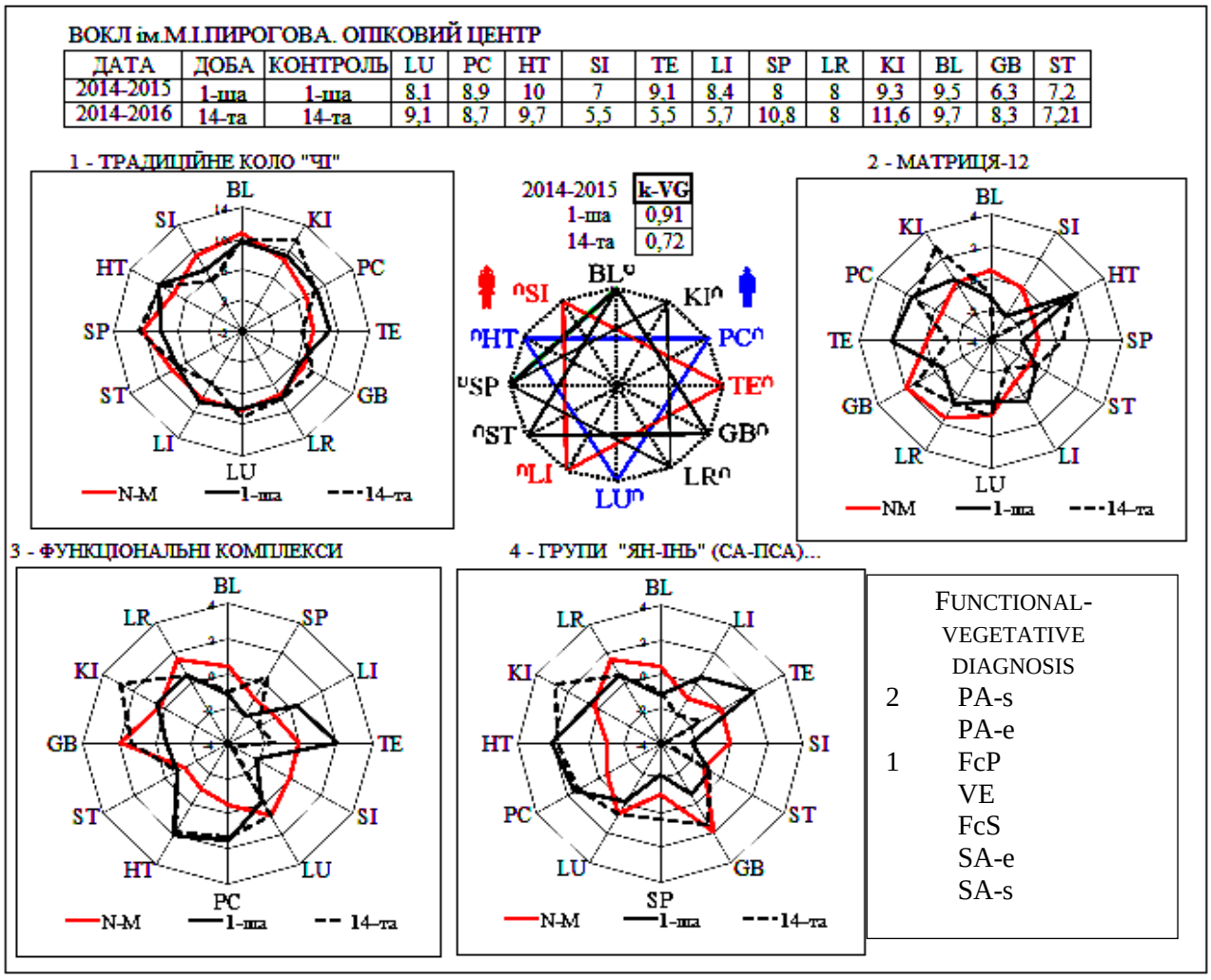
Fig. 2. Functional state of the vegetative nervous system of the burn patients with the index of injury severity from 60 to90 points on the 7-14 day (n = 30).

On the 14-th day the CVH increased from 0,66 to 0,72, which testified to the increase of the functional activity of the sympathetic division of the VNS and the tendency to rehabilitation of the vegetative equilibrium. The following channels continued to be excited: PC-KI-HT-SP (pericardium-kidneys-heart-spleen). The following channels remained oppressed SI-GB-TE (small intestine-gall bladder-lymphatic system).

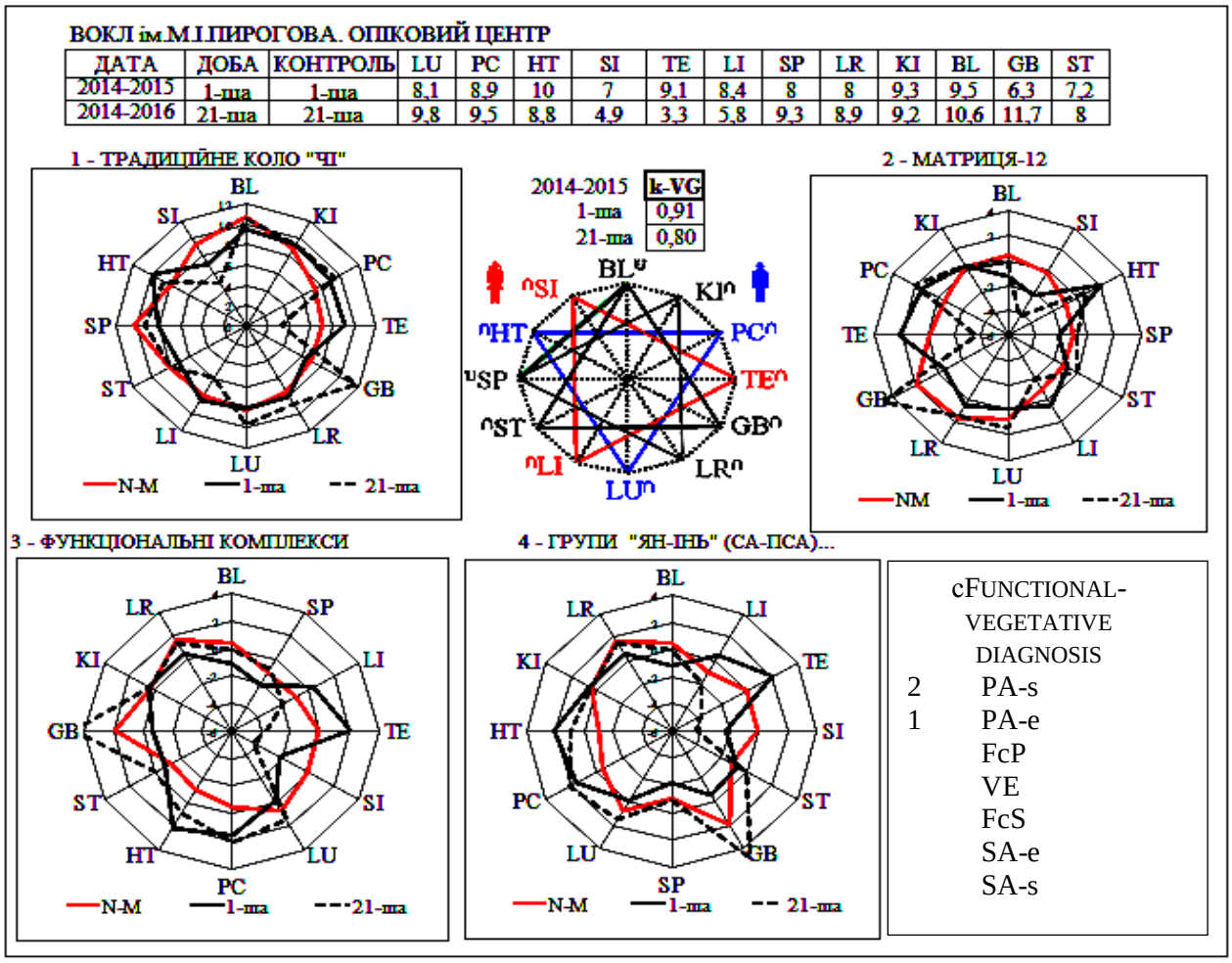
From the 14-th to the 21-st day the CVH continued to grow, and on the 21-st day it was 0,80. The parasympathetic activity of the VNS transferred from the state of the significant into the state of the expressed. In the state of excitation were the channels PC-BL-HT-ST-GB (pericardium-urinary bladder-heart-stomach-gall bladder). In the state of oppression were TE-SI-LI (lymphatic system-small intestine-large intestine).

By the 50-th day, the functional equilibrium of the VNS was renewing, which was testified by the level of the CVH that was 0,95 (fig. 3).

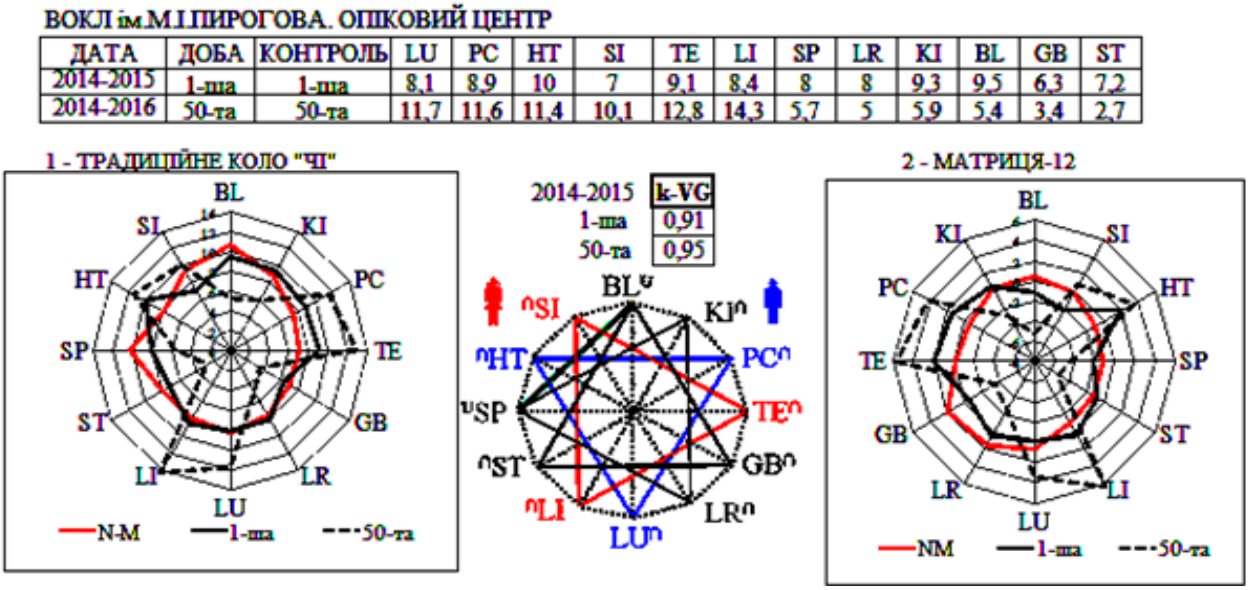
Day	Activity of the functional-vegetative systems in %												
	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST	**CVH**
1-st	8,10	8,90	10,0	7,00	9,10	8,40	8,00	8,00	9,30	9,50	6,30	7,20	**0,91**
14-th	9,10	8,70	9,70	5,50	5,50	5,70	10,8	8,00	11,6	9,70	8,30	7,21	**0,72**



Day	Activity of the functional-vegetative systems in %												
	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST	**CVH**
1-st	8,10	8,90	10,0	7,00	9,10	8,40	8,00	8,00	9,30	9,50	6,30	7,20	**0,91**
21-st	9,80	9,50	8,80	4,90	3,30	5,80	9,30	8,90	9,20	10,6	11,7	8,00	**0,80**



Day	Activity of the functional-vegetative systems in %												
	LU	PC	HT	SI	TE	LI	SP	LR	KI	BL	GB	ST	**CVH**
1-st	8,10	8,90	10,0	7,00	9,10	8,40	8,00	8,00	9,30	9,50	6,30	7,20	**0,91**
50-th	11,7	11,6	11,4	10,1	12,8	14,3	5,70	5,00	5,90	5,40	3,40	2,70	**0,95**



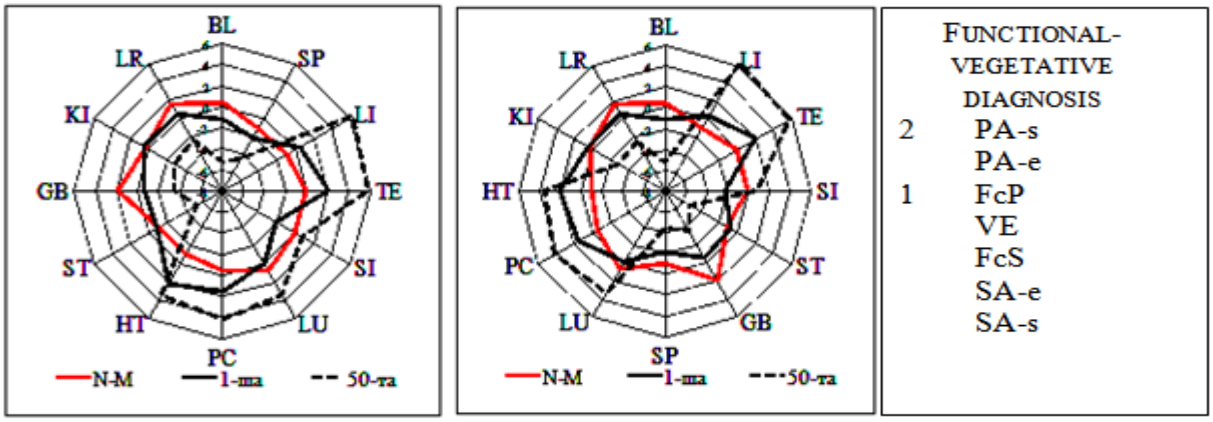


Fig. 3. Functional state of the vegetative nervous system of the burn patients with the index of injury severity from 60 to 90 points on the 50-th day (n=30).

Conclusions:

1. During the critical period of the burn injury, burn patients with the index of injury severity of 60-90 points demonstrated disturbance of the vegetative homeostasis in the direction of expressed and significant parasympathetic activity.

2. From the 14-th day, we noticed the tendency to independent renewal of the vegetative equilibrium, which is testified by the CVH.

3. Significant excitation and oppression of the acupunctural channels on the 50-th day after the trauma testify to the functional pathology and the necessity for the rehabilitation of the burn patients during the healing period, with the purpose of the renewal of the physiological circulation of energy through the channels.

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