

## CONSIDERATIONS ON THE STATE OF CERTAIN HIGHER NERVOUS ACTIVITY INDICES IN PATIENTS WITH SKIN DISEASES UNDER VARIOUS CLIMATE INFLUENCES

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The skin is an organ closely related to the central nervous system, and is subjected to its constant effects. Numerous investigators (1, 4, 5, 6 etc.) draw attention to the direct relationship between the functional changes in the central nervous system, the brain cortex respectively, and the occurrence and course of some dermatoses (eczema, neurodermitis, urticaria, psoriasis etc.).

Regardless of the great number of clinical and experimental studies performed, many problems concerning the alterations in the functional condition of the central nervous system and their significance for the occurrence, course and treatment of the skin diseases remain obscure. Particularly vague is the effect of the changes, marked in the functional state of the cerebral cortex under the effect of climatic factors, upon the course of skin diseases. Any research work in this direction represents theoretical and practical interest.

In order to investigate the changes in the functional state of the cerebral cortex, a variety of methods are resorted to. The latent period of the brain condition-reflexive activity is one of the indices of cortical processes, which could afford measurement for most of the analysers, and thereupon a number of authors (*Frolov, Pravdin, Shur, Kolliarovski* etc.) utilize it very often for studying the mechanism of action of the various stimulants of the organism.

After reviewing pertinent literature data concerning the significance of the changes in the functional state of the central nervous system for the occurrence and development of skin diseases, the interest surged by the investigation of these changes, brought about by the effect of climatic factors, upon various skin diseases and the frequent use of reactive time (latent period) as an index for the condition of the cortical processes, we established our goals as follows:

1. To study the changes occurring during the reactive period in patients with skin diseases undergoing climate treatment (on the mountain or at sea).
2. To make inferences concerning the functional state of the cortical processes in patients with skin diseases, subjected to the effect of the factors cited above.

### Methods and material

For achieving of the targets thus established, we investigated the changes occurring during the latent period and the speed of motor reaction of the motor reflexes in 113 patients with skin diseases, undergoing climate treatment for an average period of 28 days. The patients underwent treatment on the mountain — 29 persons and at sea shore — 84. Thirty individuals were treated during the winter and 83 — in summer.

Measurements were made of the latent time and speed of motor reaction, with light and sound stimulants, using the chronoreflexograph — apparatus (2). Fifteen red lights were fed in the average (weak stimulant) and 15 bells (strong stimulant). The signals were fed in different time intervals (from 0,8 to 3 sec.) persisting until disconnected by the individual investigated. With every individual investigated a stereotype was formed in the following pattern: bell, zoomer (differentiation of the bell), red light, green light (differentiation of the red one). The patients were studied twice — before enterprising the treatment course and after it. Some of them were followed up for a certain period of time following resort therapy. Besides the 113 individuals described, a series comprising 100 additional patients were investigated a single time, serving as a control group for the various diseases. The data obtained from the investigations, elaborated and assessed individually and according to groups, are illustrated in tables. The data concerning the additionally studied 100 controls and the changes in the stereotypes under the effect of climate treatment are not discussed in the present report.

### Results

*Psoriasis patients* — The series of 26 women treated at sea during the summer reveals an initial mean speed for the latent time of the bell amounting to 15,72 hundredths of the second (with minimum value 12,9 and maximum — 23,1). Similar are the figures of the latent period in 21 male patients also undergoing sea resort treatment in the summer — mean value 15,37 hundredths of the second (11 to 21). The control group (6 persons) receiving treatment at sea during the winter exhibits a much higher output (initial) value for the latent time — 19,48 with the same amplitude of individual mean values, from 12 to 21,4. Regardless of the different clinical outcome of the patients with psoriasis, treated at sea-resorts in summer and winter, and of the mean output values of the indices investigated, the mean value of the latent time decreases uniformly with about two hundredths of the second (table 1).

The data gathered for the speed of reaction of the motor reflex are identical to those of the latent time. The slight difference noted, directed towards increase during the winter could be explained with the influence of the thermal factor, independently of the fact that the studies were carried out in conditions of heat comfort.

*Neurodermitis patients* — Of the 12 patients treated at mountain resorts, the mean values of latent time during the winter are rather weakly influenced, whereas during the summer they are decreased with about 1 hundredth of the second for the sound and 3 hundredths for the red light. In

Table I

Value of the latent time and speed of motor reaction of the investigated patients  
in hundredths of the second

Diagnosis	Season	Site	Sex	Latent time				Speed of motor reaction			
				bell		red light		bell		red light	
				I	II	I	II	I	II	I	II
Psoriasis	summer	sea	f	15.72	15.10	18.81	17.64	6.53	6.20	6.00	5.74
	summer	sea	m	15.37	13.90	15.62	16.05	5.03	4.70	4.77	4.50
	winter	sea	m	19.48	17.27	20.37	18.75	5.68	6.27	5.01	6.12
Neurodermitis	winter	mount	m	14.89	15.43	16.18	17.60	4.77	5.26	4.60	4.00
	winter	"	f	18.98	16.86	22.32	21.92	6.80	4.86	5.19	4.78
	summer	"	f	14.50	12.50	16.00	13.00	7.00	8.30	6.50	7.25
	summer	sea	f	20.10	14.60	21.30	18.50	4.90	5.10	4.80	4.60
	winter	sea	m	16.20	16.05	18.00	15.30	5.00	3.70	4.50	4.50
Eczema	winter	mount	f	16.13	15.50	20.18	18.28	5.90	5.60	5.90	5.08
	winter	"	m	18.50	18.03	22.83	19.77	3.73	4.27	5.33	4.03
	summer	"	f	17.50	14.47	18.63	17.80	5.80	5.63	6.37	5.90
	summer	sea	m	18.45	17.55	16.67	15.67	5.72	4.75	4.97	4.22
	summer	sea	f	21.50	16.10	23.00	17.80	5.85	4.65	5.70	5.30
Urticaria	summer	mount	f	19.45	16.74	20.24	19.22	5.40	6.19	5.50	5.15
	summer	sea	f	14.63	12.73	16.00	17.42	6.26	5.23	6.00	5.95
Tbc cutis	summer	sea	m	16.86	14.32	17.48	16.11	5.92	5.82	5.80	5.10

the 8 patients with neurodermitis treated at sea in the summer, the mean values of the latent time for sound are decreased from 20,1 to 14,6, whereas for the red light — from 21,3 to 18,5. In the control group of patients with neurodermitis treated at sea during the winter, the changes in the latent time are insignificant; from 16,2 to 16,05 for the sound analyser and higher for the light analyser, reduction from 18 to 15,3.

The speed of motor reaction is rather slightly affected in patients undergoing treatment in the mountain as well as in patients treated at sea (table I).

*Patients with eczema* — In the course of studies on a series comprising 18 patients, results were obtained analogous to those in neurodermitis. The mean values of latent time in the patients undergoing treatment in mountain during the winter for the sound analyser are less influenced (with about 1 hundredth of the second), whereas in the summer — with about 3 hundredths. The latent time for the red light is reduced in mountain and at sea as well (table I). The speed of motor reaction in those treated in mountain is influenced (with less than 1 hundredth of the second), whereas at sea the reduction is greater than one hundredth.

*Patients with urticaria* — The inference is reached, based on the management of 9 patients, that the results are similar to those in neurodermi-

tis and eczema patients, but with slightly lower values (table 1). The patients treated in mountain during the winter do not exhibit alteration of latent time. Those treated in the mountain as well as at sea during the summer reveal a clearly outlined trend towards lowering the values of latent time for sound, and towards elevation of the values for red light.

*Patients with tbc cutis* — All 11 patients underwent treatment at sea resorts. The mean value of the latent time for the sound stimulant with them was reduced from 16,86 to 14,32, and for red light — from 17,48 to 16,11. Insofar speed of reaction is concerned, the changes of the mean value are superfluous — from 5,92 to 5,82 with sound and from 5,80 to 5,10 with light stimulant.

The follow-up study of several patients up to one month after completion of treatment, showed a tendency for restoration of initial mean values of latent time. The latter finding, though proved on a small number of patients, suggests that the favourable alterations achieved in the functional state of the cortex during the 28-day treatment course are temporary and transitory.

The shortening of the latent period established and the speed of motor reaction for both investigated analysers (sound and light) in the dermatoses studied, could be explained with inhibition of the retention processes in the cortex of the brain, observed by a number of authors in certain skin diseases, and correspondingly — enhancement of excitation processes. The conclusion reached by us is in accordance with the investigations of S. E. Gorbovitskii, N. A. Ivanov and E. A. Dosichev (3), who establish a lower threshold of irritability of the higher nerve centers in the course of investigations on the adequate optic chronaxy in patients with eczema and psoriasis. During the treatment the adequate optic chronaxy was subjected to slow, undetectable and not always reflecting the clinical state of the patient changes. The majority of patients discharged were in condition of clinical health or with considerable improvement, but exhibited unfavourable indices of the functional state of the higher nerve centers. A substantial part of these patients had subsequent recurrences.

Against the background of the clinical material reported and its discussion, the following conclusions seem justified:

### Inferences

1. Climatotherapy in patients with skin diseases — with various dermatoses (psoriasis, eczema, neurodermitis, urticaria and tbc cutis) alters in most of them the latent period and speed of motor reaction to sound and light analysers towards reduction.

2. In the dermatoses studied, the climatotherapy carried out during the summer influences more substantially the latent time and speed of motor reaction. A greater reduction is obtained as compared to the winter season.

3. During the follow-up study of cases up to one month subsequent to climatotherapy, a tendency is marked towards restoring the initial values in mean values of latent time and speed of motor reaction. This evidence conforms with the long-lasting effect of therapeutical outcomes reported by other authors.

4. The results achieved by us could be explained with the fact that climatic influence has an essential bearing on the functional state of the central nervous system, by decreasing the power of the retention processes and restoring the level of excitation processes in the cortex of the brain.

#### REFERENCES

1. Бедненко П. Ф. — *ВВД*, 6, 3, 1955.
2. Бояджиев Вл., Г. Кочорапов — *Гигиена*, 4, 21, 1961.
3. Горбовицкий С. Е., Н. А. Иванов, Е. А. Досычев — *ВДВ*, 6, 3, 1957.
4. Желтеков М. М. — *ВВД*, 1, 3, 1954.
5. Саенко-Дюбарская В. Ф. — *ВДВ*, 3, 8, 1957.
6. Пшеничный И. П. — *ВДВ*, 7, 8, 1960.

#### ОТНОСИТЕЛЬНО СОСТОЯНИЯ НЕКОТОРЫХ ПОКАЗАТЕЛЕЙ ВЫСШЕЙ НЕРВНОЙ ДЕЯТЕЛЬНОСТИ У КОЖНЫХ БОЛЬНЫХ ПРИ РАЗЛИЧНЫХ КЛИМАТИЧЕСКИХ ВОЗДЕЙСТВИЯХ

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#### РЕЗЮМЕ

Исходя из значения функционального состояния центральной нервной системы в возникновении кожных заболеваний, авторы проследили изменения, наступающие в реактивное время и скорость двигательной реакции под влиянием звуковых и световых раздражителей у 113 кожных больных, у которых проведено климатолечение на море и в горах, в среднем в продолжении 28 дней.

Установлено укорочение латентного периода и скорости двигательной реакции для звукового и светового анализаторов, что может быть объяснено ослаблением процессов торможения в коре головного мозга. Климатолечение кожных больных с различными дерматозами (псориаз, экзема, невродермит, уртикария и ТБК кожи) проведенное летом (независимо в горах или на море) укорачивает латентное время и скорость двигательной реакции более значительно, чем зимой.

Проконтролированные случаи до 1 месяца после климатолечения показывают тенденцию к возвращению начальных величин средних показателей латентного времени и скорости двигательной реакции. Этот факт отвечает и продолжительности лечебного результата (появление рецидивов).