

STUDY OF ACUPUNCTURE EFFECT ON NEUROSIS PATIENTS BY USING THE METHOD OF CARDIOINTERVALOGRAPHY

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The effectiveness of reflexotherapy in the treatment of numerous functional diseases and painful syndromes is proven by centuries-long practice. However, there exist many unsolved problems concerning the changes caused by acupuncture affecting various functions. The aim of the present work is to study the influence of acupuncture seance on the cardiac rhythm. One of the most informative methods, namely that of cardiointervalography was used in our study. It is to be noted that this method was never applied before when reflexotherapeutic effects were investigated.

Material and methods

The study covered 19 males and 19 females aged between 23 and 48 years with neurosis — neurasthenic syndrome. The complaints of heart origin (heaviness in the cardiac region and perception of an accelerated pulse) prevailed in the picture. ECG was twice recorded in all patients 3—5 min before and after acupuncture procedure. The following points were used for reflexotherapy: E₃₆, GJ₄, RP₆, VB₂₀, the extrameridian in-tan and T₂₀. The second variant of the suppression method was applied. The needles remained 20 min each. The duration of 100 R-R intervals was registered and measured on ECGs. Dynamic series for statistical processing for both stages of examination of any patients were constructed. The following parameters were determined by using an electronic calculator ES-10-20: the arithmetic mean of the whole series of cardiointervals (\bar{x}); the mode (Mo), the variation range (Δx) and the amplitude of mode (A_{Mo}). The voltage index (VI) was calculated from the data obtained after a formula proposed by R. M. Baevskij and V. I. Kudryavtzeva. The pulse frequency (PF) was also estimated. A variation analysis was applied to process any data concerning males and females separately and as a whole. The values with $p < 0,05$ were considered reliable.

Results and discussion

The results obtained are presented on table 1. It can be seen that acupuncture induces unidirectional and statistically significant changes of any measured and calculated indexes in males and females both. There are some differences in the degree of the changes after reflexotherapy in comparison with the levels of these indices before it (fig. 1). There are better expressed changes of the mean duration of R-R intervals, PF, Mo and VI in the group of males (respectively with 14,2 per cent, 12,4 per cent, 13,2 per cent, and 37 per cent) while the rest three index-

Table 1

Indexes	Moment of examination	Males-19		Females-19		Total-38	
		\bar{x}	Sx	\bar{x}	Sx	\bar{x}	Sx
R-R interval duration (in sec)	before	0,7204	0,0206	0,7314	0,0207	0,7259	0,0144
	after	0,8228	0,0190	0,7717	0,0227	0,7973	0,0152
Variation coefficient (in per cent)	before	5,1805	0,4133	3,8978	0,3814	4,5392	0,2967
	after	5,5379	0,5301	4,1797	0,3656	4,8588	0,3366
Pulse frequency (beats per min)	before	84,4947	2,4431	83,2368	2,3405	83,8657	1,6718
	after	74,0421	1,8182	78,3578	2,3067	76,1999	1,4913
Mode (in sec)	before	0,7205	0,0207	0,7294	0,0212	0,7249	0,0146
	after	0,8157	0,0200	0,7757	0,0219	0,7957	0,0150
Amplitude of mode (in per cent)	before	35,7894	1,7664	45,1578	2,3523	40,4736	1,6425
	after	31,5263	2,5065	36,9473	3,2312	34,2368	2,0655
Variation range (in sec)	before	0,1326	0,0118	0,0926	0,0102	0,1126	0,0083
	after	0,1473	0,0128	0,1105	0,0142	0,1289	0,0099
Voltage index (in relative units)	before	274,4210	4,9908	438,1578	4,5494	356,2894	0,5444
	after	173,0000	5,2113	314,9473	4,9967	243,9736	2,5639

es (variation coefficient, amplitude of mode, and variation range) show better expressed changes in the group of females (respectively with 7,2 per cent, 18,2 per cent, and 19,3 per cent). There

are characteristic and unidirectional changes of the mode, its amplitude, and of the value of variation range in males and females (separately and totally) as a result from acupuncture procedures (fig. 2). These indices characterize the participation of the main factors in cardiac rhythm formation (2). The mode which characterizes the humoral channel for cardiac rhythm regulation according to the bicontour model of rhythm management (fig. 3), on behalf of the central nervous system through the sinus node (2) is replaced to the right. A_{Mo} is correspondingly reduced which gives an evidence for a reduced sympathetic influence upon cardiac rhythm. The enlargement of the variation range after reflexotherapy argues for the increase of vagus influence on cardiac rhythm formation. The increase of mode values of the cardiointervals, the decrease of its amplitude and the enlargement of the variation range is considered an asthenization of the regulation mechanisms which form the cardiac rhythm (4). We tend to accept that in this occasion acupuncture restores the normal vagus tone. This process is accompanied by a diminution of the functional activity of the sympathetic and of the hypothalamo-hypophyseal-adrenal

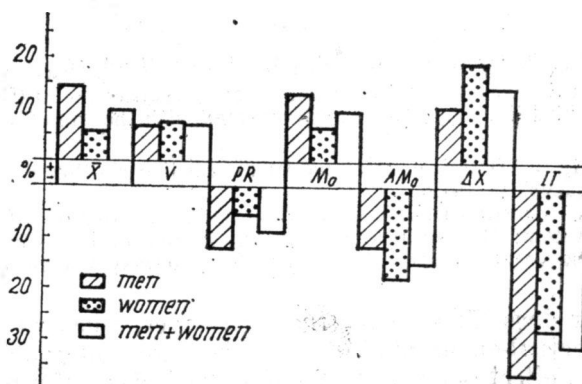


Fig. 1. Percentage change of arithmetic mean (\bar{x}) of 100 R-R intervals of ECG, variation coefficient (V), pulse frequency (PR), Mode (Mo), mode amplitude (A_{Mo}), variation range (Δx) and voltage index (VI) after acupuncture towards the rates before it accepted for 100

systems (2). This is confirmed by

the observed VI decrease and the increase of the variation coefficient in both patients' groups separately and totally as well.

The increase of the influence of the parasympathic part of the vegetative nervous system upon the cardiac rhythm which is expressed in PF decrease after acupuncture is well known in the literature on reflexotherapy when humans (1)

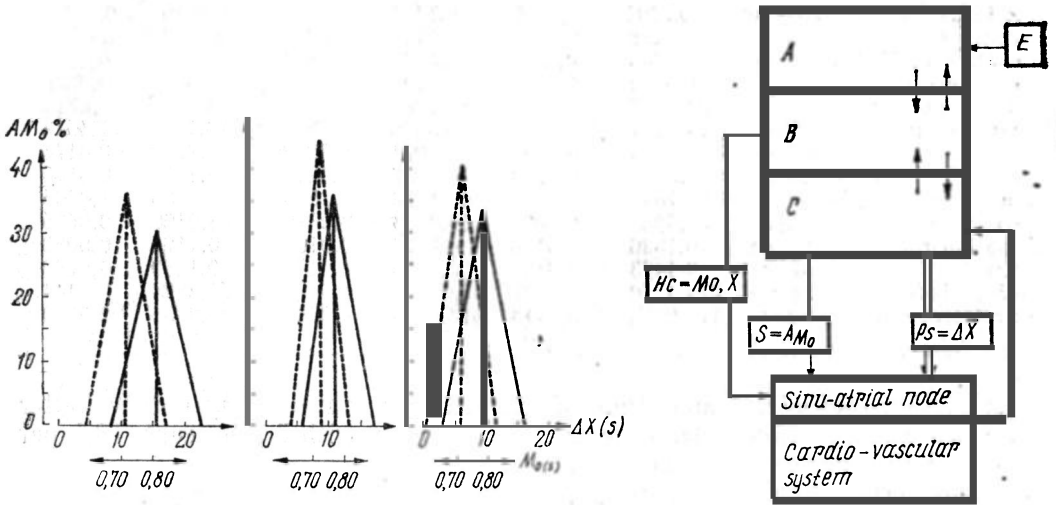


Fig. 2. Mean rates of mode (M_o), its amplitude (A_{M_o}), and variation range (ΔX) of R-R intervals in ECG before and after acupuncture seance: males (first fig.), females (second fig.) and total (third fig.). A_{M_o} peaks are connected with the end of variation range conditionally

Fig. 3. Double-contour model for cardiac rhythm management (our modification after R. M. Baevskij, 1979)

A — brain cortical level; B — midbrain; (region of subthalamus); C — vegetative nervous system; E — excitation inducing influence; Hc — humoral channel; S — sympathetic part of the vegetative nervous system; Ps — parasympathic part of the vegetative nervous system

or dogs (7) are concerned. However, when we studied the influence of the intellectual-emotional stress on the cardiointervalographic parameters we established an effect opposite to the described above (5): replacement of the mode to the left, an increase of its amplitude and shortening of the variation range. The data from our present study of the influence of acupuncture on R-R intervals as interpreted from this point of view convince us once more of the fact that acupuncture causes a reduction of the psychoemotional tension. This argues, therefore, for the need of the due wide application of reflexotherapy within the complex of therapeutic procedures concerning these wide-spread diseases of the nervous system.

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ИЗУЧЕНИЕ ВЛИЯНИЯ АКУПUNKТУРЫ НА НЕВРОТИЧЕСКИ БОЛЬНЫХ ПРИ ПОМОЩИ МЕТОДА КАРДИОИНТЕРВАЛОГРАФИИ

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РЕЗЮМЕ

До и после иглотерапевтического сеанса, примененного невротическим больным, сде- лана электрокардиография. Измерялась продолжительность ста R-R интервалов. Из полу- ченного вариационного ряда статистически устанавливается замедление пульсовой частоты всех исследованных пациентов. При анализе других данных (моды, амплитуды моды, вари- ационного размаха, индекса напряжения) видно, что иглолечение влияет благоприятно на гуморальный канал регулирования сердечного ритма. Подавлено влияние симпатиковой доли вегетативной нервной системы на сердечный ритм. Наряду с этим повышен физиологи- ческий вагусовый тонус сердца. Индекс напряжения как интегральный показатель состоя- ния нервно-эмоционального напряжения у большинства исследованных больных в границах нормы.