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MODIFICATIONS OF THE PERIPHERAL LEUKOGRAM BY THE INTERACTION OF THE BIOFIELD AND ARTIFICIAL ELECTROMAGNETIC FIELD

BY

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The interaction between the biofield and the artificial electromagnetic field modified the peripheral leukogram in rabbits as follows :

1. The number of leucocytes per mm is increased.
2. The redistribution of the formula of leucocytic elements is to the effect that the neutrophilous polynuclei decreased while the monocytes, basophils and lymphocytes increased.

A homogeneous group of 20 adult rabbits (9 males and 11 females) weighing between 1700 and 2000 g was used in our investigation. Rabbits were exposed to a rectangular pulsating electromagnetic field with one-second pause after three seconds of excitation, for 10 consecutive days. Each experiment lasted three minutes.

The observations made when starting the experiments on the interaction between the biofield and the artificial electromagnetic field, will be presented in a separate paper.

The experimental procedure has been described by us in the paper "Normal myelogram in the rabbit", dealing with the controls selected by us.

Pipette samplings were taken for leucocyte counts and the leukogram was established by smears on slides; 148 leucocyte counts were made in all: 52 controls, and 48 after the 5th and 10th exposure, respectively to the electromagnetic field. Eight WBC were carried out for each rabbit, amounting to 464 WBC, distributed as follows: 160 before exposure to the electromagnetic field and 152 after the 5th and 10th experiment, respectively. Slides were stained according to the May-Grünwald-Giemsa technique as used in man as well.

RESULTS

a) The influence of the interaction between the biofield and the artificial electromagnetic field (EMF) on the leucocyte count.

Analysis of Table 1, containing the results of counts made as already shown, points out that homeostasis limits are not exceeded.

The following statistical indices were calculated: arithmetical mean (M_a = No. leucocytes/cmm), % variation, standard deviation (σ), variability coefficient (Vc) and the Student mean error (Em. t), as shown in the table

Table 1

Group	No.leuc. cmm. M_a	Variation %	σ	Vc	Em. t
Control	7024	—	1458	20	686
After 5 exp.	7878	12.158	1351	17	682
After 10 exp.	8562	21.896	1259	14	637

Examination of the data presented in Table 1 emphasizes that the interaction between the biofield and the artificial EMF results in the increase of the leukocyte count, i. e. : after 5 and 10 exposures there is a 12.158 % and 21.896 % increase, respectively. A simultaneous decrease is observed in the standard deviation (σ) and the variability coefficient (Vc), while the corrected mean error (Student) is almost constant, ranging between the admitted limits of the leukogram.

b) Influence of the interaction between the biofield and the artificial EMF on the WBC.

The following table presents the mean WBC for the 464 leukograms as well as their percentage variations.

Table 2

Leucocyte	%			Variation % \pm	
	Control	After 5 exp. EMF	After 10 exp. EMF	After 5 exp. EMF	After 10 exp. EMF
Neutrophils	56.375	48.039	38.118	-14.785	- 32.385
Eosinophils	0.875	1.434	1.026	+63.890	+ 17.600
Basophils	2.350	3.500	3.947	+48.936	+ 67.000
Lymphocytes	38.475	44.131	53.052	+14.131	+ 37.575
Monocytes	1.425	2.302	3.447	+61.543	+141.894
Intermediary WBC	0.350	0.539	3.394	+54.000	+ 11.420

A new distribution of the leucocytes is observed, yet within the homeostasis limits.

To emphasize the variations of Fig. 1, a graph is given below.

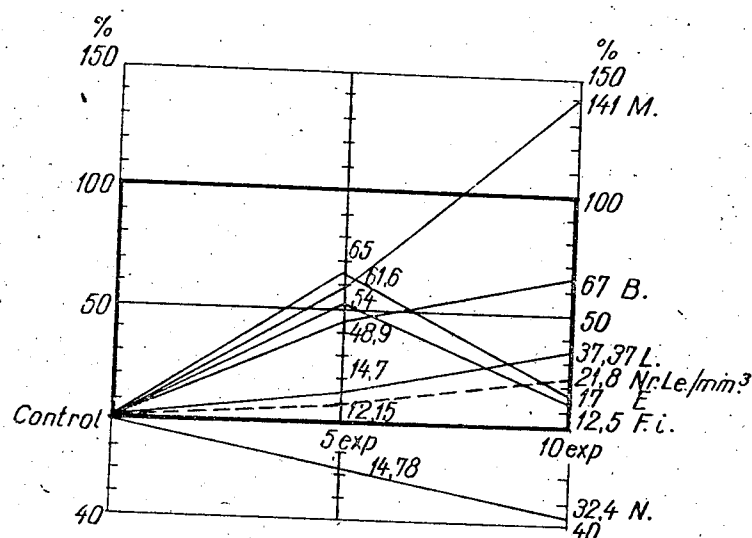


Fig. 1. — Percentage variations of the Leucogram. M, Monocytes; B, Basophil cells; L, Lymphocytes; N, Leucocytes number/mm³; E, Eosynophyl cells; F. i, Intermediary form; N, Neutrophyl cells.

Table 2 points out that the interaction between the biofield and the artificial EMF results in a decrease of polynuclear cells throughout the experiment. Simultaneously, basophil polynuclear cells, lymphocytes and monocytes exhibit a percentage increase. Eosinophil polynuclear cells and intermediary forms after having increased start decreasing tending to fall within early values. Table 2 shows that monocytes recorded most significant percentage increases, followed by basophils and lymphocytes.

The statistical calculation of these data is given in Table 3

Table 3 evidences that neutrophil polynuclear cells and lymphocytes are the most homogeneous leucocytic group displaying very little standard deviation, with small modifications in the course of the experiment.

Table 3

Leucocyte	σ			eM.t		
	Control	After 5 exp. EMF	After 10 exp. EMF	Control	After 5 exp. EMF	After 10 exp. EMF
Neutrophils	5.529	4.312	5.716	4.192	3.430	3.605
Eosinophils	0.380	0.682	0.516	0.288	0.547	0.414
Basophils	1.026	4.326	0.366	0.686	0.322	0.294
Lymphocytes	4.892	3.952	6.470	3.784	3.171	5.194
Monocytes	0.966	1.194	1.112	0.631	0.913	0.892
Intermediary WBC	0.277	0.787	0.322	0.212	0.656	0.236

The absolute mean was found to range between the sum and the difference of the arithmetical mean and the mean Student error. In the case of neutrophils, the absolute mean ranges between 56.375 ± 4.195 , i.e. between 52.183 and 60.567.

The variation of the Student mean error ranges between $\sigma \pm eMt$. In the case of neutrophil polynuclear cells it ranges between 1.337 and 9.721 %, being approximately placed in the middle of this interval.

The size of the representative sample indicates the lowest number of observations required for conclusive results. In the case of neutrophil leucocytes 288 observations are necessary. In the case of the other leucocytic elements we obtained figures of the same order of magnitude.

A slightly higher number of observations than the one resulting from calculus were carried out.

From the above investigations the following conclusions may be drawn :

1. The interaction of a biofield with a pulsatory artificial EMF influences the leucocytic dynamics in the rabbits as follows :

- a) the number of leucocytes/cmm increases and
- b) the leukogram is modified by the new distribution of the elements of the leucocytic formula.

2. The redistribution of leucocytic elements in the formula occurs as following :

- a) Increase of lymphocytes, monocytes and basophils and
- b) Decrease of neutrophil polynuclear cells.

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