5905

Leucocytic Concentration in Skin and Trachea Following External Application of Heat and Cold.

A. J. NEDZEL. (Introduced by Lloyd Arnold.)

From the Department of Bacteriology and Preventive Medicine, University of Illinois College of Medicine, and Research Laboratories of the Illinois Department of Public Health, Chicago.

Several observers have used alterations in the number of leucocytes in the peripheral circulation as index of the autonomic functional status of the area under examination. This report represents a preliminary study of the influence of the application of heat and cold to the skin of dogs upon the relative concentration of leucocytes in the trachea as compared to the skin.

The trachea of a dog was exposed by median line incision; nembutal anaesthesia (1 cc. of a 3% solution per kilo intraperitoneally) was used. The incision was extended through the wall of the trachea and about 2-inch length of the mucosa was exposed. Blood specimens were taken simultaneously from the mucosa of the trachea and from the ear of the animal for leucocyte counts. These counts were made through a certain extent of time during which ice and hot water packs were applied to the body surface.

The accompanying chart (I and II) shows the result of these experiments. The abscissa represents the time in minutes and the ordinate the leucocyte count. "N" is the average normal leucocyte count, plus and minus representing an increase or decrease of the leucocytes expressed in percent. The continuous line shows the leucocyte count of peripheral blood and the dotted line the leucocyte count of blood from the mucosa of the trachea. Ice packs were applied to the chest and abdomen in 2 animals and the results shown in Chart I. Chart II (8 animals used) represents the same procedure, except that heat (hot moist towels) was applied at the time indicated.

To these 2 series we added (Chart III) (2 dogs) where instead of chilling the animal with ice we injected intravenously 10 cc. of milk. This produced a much stronger reaction.

The alteration in the concentration of leucocytes per unit volume of blood in the capillaries of the ear and of the trachea of dogs indicates that both follow the same general autonomic pattern. The initial response to heat applied to remote skin areas indicates a dilation of the blood vessels in the mucosa of the trachea at the same time as

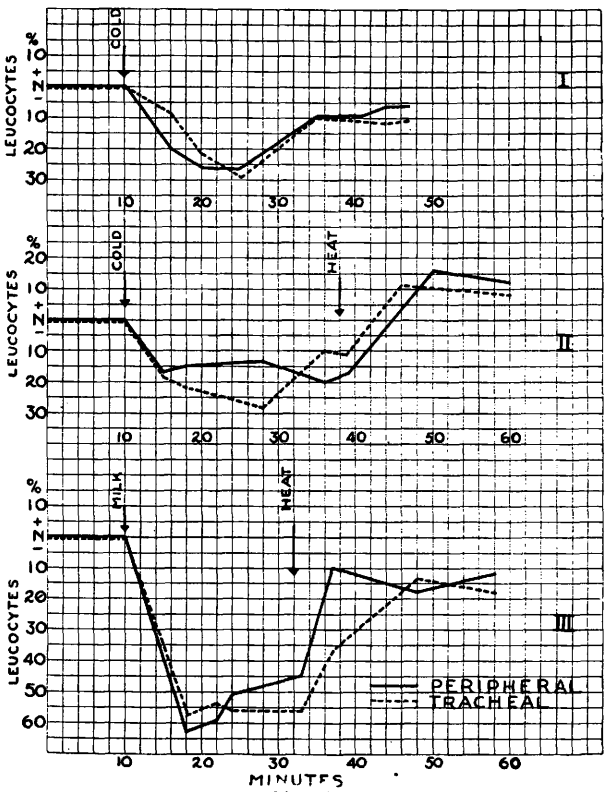

FIG. 1.

Ordinate: Leucocytes per cc. of blood.

"N" represents the normal or beginning count. The % increase or decrease are indicated above or below this initial count.

Abscissa: Time in minutes.

The continuous line represents the peripheral (ear) leucocyte curve, the broken line, the same in blood from mucosa of trachea.

the same reaction takes place in the skin. When cold is applied to remote skin areas, the tracheal capillaries contract with those of the skin.