

Haematological changes in experimental exercise

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Abstract

Premises. In the first stage adreno-sympathetic system, followed by hypothalamo-hypophyso-thyroid axis, hypothalamo-hypophyso-gonadotropic axis, somatotroph hormone, renin-angiotensin system and associated hormones, opioid peptides, insulin-glucagon systems are implicated in neuroendocrine activation during exercise. Regarding the corticosuprarenal hormones, glucocorticoids (cortisol) have the principal role in the adaptation to exercise and their levels increase with exercise intensity.

Objectives. The effects of exercise were followed up in rats. In addition the supplementation of hydrocortisone hemissuccinate on the leukocyte, red blood cell and platelet count, on the phagocytic index as well as the influence on the capacity of aerobic exercise were evaluated.

Material and methods. The investigations were carried out on two groups of 10 male albino Wistar rats (weighing 150-170 g), daily trained by exercise using the swimming test for 28 days. Group I was formed of control animals and Group II with supplementation of hydrocortisone hemisuccinate (1.1 mg/day) administered twice a week for 28 days. Venous blood samples were taken before exercise on the 1st day and following exercise on the 14th and 28th day.

Results. The aerobic exercise capacity increased significantly by training in both groups. The leukocyte count showed a significant decrease on the 28th day as compared with the 1st day in group II and it showed a significant increase on the 14th day in group II as compared with group I. The phagocytic index increased significantly on the 14th day in group II as compared with group I. The erythrocyte count decreased significantly in group II on the 28th day as compared both with the first day and with the 14th day of training and it decreased significantly on the 28th day in group II as compared with group I. The platelet count revealed non significant changes in both groups in training.

Conclusions. (a) The aerobic exercise capacity increased very significantly after training in both groups. (b) Hydrocortisone hemisuccinate increased significantly the aerobic exercise capacity in group II as compared with the control group. (c) The erythrocyte and the leukocyte count decreased significantly on the 28th day in group II compared to the control group; the platelet count presented non significant changes on the 14th day and on the 28th day compared with the 1st day.

Keywords: exercise, erythrocytes, leukocytes, platelets, phagocytic index, hydrocortisone hemissuccinate.