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ABSTRACT BOOK

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THE STIMULATORY EFFECT OF MODERATE HEAT ON RAT PITUITARY ACTH CELLS: HISTOLOGICAL AND HORMONAL STUDY

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Pituitary ACTH producing cells are very sensitive towards changes in duration of the heat exposure. The aim of this study was to examine the effects of 4-day continuous exposure of rats to moderate heat on histological and secretory characteristics of ACTH cells in adult male rats. The experimental group was exposed to 35±1°C for 4 days, whereas the control group was kept at room temperature during the same period. ACTH cells were studied using the immunohistochemical and immunofluorescent procedures. The morphometry was conducted using M₄₂ multipurpose test system, while the hormone concentrations were determined by ACTH IMMULITE assay and corticosterone ELISA test. Compared to the controls, a significant (p<0.05) decrease of the body weight by 19.8% and significant (p<0.05) increase of the absolute and relative volumes of the pituitary gland by 23.1% and 36.1% respectively, were registered. It was found that in experimental group neither the localisation nor the shape of ACTH cells was significantly changed, but the intensity of immunofluorescence signal was significantly (p<0.05) decreased. The cellular and nuclear volumes of ACTH cells were increased (p<0.05) by 6.9% and 14.3% respectively, while the volume density of ACTH cells was decreased (p<0.05) by 20.0%, in comparison with the corresponding controls. The observed changes were in accordance with increased (p<0.05) values of blood ACTH and corticosterone concentrations by 23.7%, and 11.8%, respectively. Based upon the histological and hormonal data, it can be concluded that 4-day continuous exposure to moderate heat causes stimulation of the pituitary ACTH cells in rats.