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ABSTRACT BOOK

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THE EFFECT OF ACUTE HEAT STRESS ON RAT PITUITARY-THYROID AXIS

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Hyperthermia induced by heat stress cause damages to various organs. Data on the effects of heat stress on thyroid gland are scarce, despite the fact that thyroid hormones (TH) play essential role in maintenance of thermogenesis and basal metabolic rate. In this study we examined effects of acute heat stress on thyroid histology and concentration of TH and thyrotropin (TSH) in sera. Adult male Wistar rats were divided in two groups (n=10): the first group were intact controls; the other group was exposed to ambient temperature of 38°C for 60 min in a hot chamber. Animals were decapitated immediately after exposure to heat stress. Thyroid glands were excised, weighed and prepared for further histo-morphometric analyses. Serum concentrations of TH were determined by RIA, while TSH was determined by ELISA. Acute exposure to ambient temperature of 38°C did not induce damages of thyroid tissue. Morphometric analysis revealed decreased volume density of thyroid follicles ($p < 0.05$), while the volume density of blood vessels increased ($p < 0.05$). Besides dilation of blood vessels, vascular congestion was also evident. In the luminal colloid of thyroid follicles numerous resorption vacuoles were evident. Serum concentrations of TH were unchanged, while TSH increased ($p < 0.05$). Acute exposure to moderate heat stress did not result in injuries of thyroid tissue. Still, increased volume density of blood vessels and accumulation of erythrocytes indicate increased thyroid blood flow. Increased blood flow, together with increased serum TSH probably contributed to increased mobilization of colloid and thyroid hormone stores under these conditions.