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## Effect of glucocorticosteroids on the blood vessels of the femoral head in white rats

Rasulov H. A., Subkhanova M. G., Eshonkulova B. D.

Tashkent State Medical University

**Relevance.** Experimental models, especially studies on rats, provide an opportunity to study pathological processes in more depth. Trials with synthetic glucocorticosteroids (GCS), such as dexamethasone, have shown that these drugs have toxic effects on endothelial cells, causing vasculopathy, microthrombosis, narrowing of capillary lumens, and perivascular fibrosis (Zhang et al., 2019; Liu et al., 2016).

These conditions affect not only the physiological state of the bone but also significantly impair its regenerative capacity. Therefore, studying morphological changes in the vascular structures of the femoral head is crucial for understanding the initial pathogenetic stages of osteonecrosis.

Thus, the relevance of this study lies in identifying vasculopathic processes caused by glucocorticosteroids and scientifically assessing them, paving the way for developing preventive and treatment methods in the future.

**Objective.** To assess the morphological and morphometric changes of blood vessels in the femoral head of rats after dexamethasone administration.

**Materials and Methods.** Thirty sexually mature laboratory rats (weight: 180–200 g) were divided into 3 groups. The first experimental group (n=14) received dexamethasone 1 mg/kg via intraperitoneal injection once daily for 14 days. The second experimental group (n=16) received the same dosage for 30 days. The control group (n=10) received physiological saline.

**Research methods.** After euthanasia, the femoral heads were extracted. The tissues were fixed in formalin and processed into paraffin blocks. Sections were stained with hematoxylin-eosin, Van Gieson, and PAS methods. Microscopic examination, morphometry and microphotography were performed.

**Results and Discussion.** In the control group, the blood vessels exhibited normal structure, with intact endothelium and a basal membrane of normal thickness. In the experimental groups, endothelial cells of capillaries and arterioles showed swelling, with microthrombosis, perivascular fibrosis, and microhemorrhages observed.

Prolonged exposure to glucocorticosteroids exerts toxic effects on vascular endothelium, disrupting microcirculation. This may contribute to the development of osteonecrosis in the femoral head.

Under the influence of glucocorticosteroids, significant morphological changes occur in the vascular structures of the femoral head, especially in arterial and venous walls. Endothelial cell swelling and nuclear hyperchromasia are observed. Desquamation of endothelial cells leads to a reduction of capillary and small artery lumens.

### References

1. Rasulov H.A. Comparative assessment of the morphofunctional features of the thyroid gland and tendons in rats with experimental hypothyroidism. *Eurasian Bulletin of Pediatrics*, 2019; 100–107.
2. Rasulov H.A. The effect of experimental hypothyroidism on structural and metabolic changes of the bone-tendon segment of limbs. “*New Day in Medicine*”, Tashkent, 2019; 2(26): 362–364.
3. Kerachian M.A., Séguin C., Harvey E.J. Glucocorticoids in osteonecrosis of the femoral head: a new understanding of the mechanisms of action. *J Steroid Biochem Mol Biol*. 2009; 114(3-5): 121–128.
4. Liu Y., Wang L., Kikuri T., et al. Mesenchymal stem cell-based tissue regeneration is governed by recipient T lymphocytes via IFN- $\gamma$  and TNF- $\alpha$ . *Nat Med*. 2011; 17(12): 1594–1601.