

UNIVERZITET U SARAJEVU
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**ULOGA KATEHOLAMINA U PATOFIZIOLOŠKIM
PROCESIMA**

-Završni rad-

Mentor: Prof. dr. Muhamed Katica

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The role of catecholamines in pathophysiological processes

-Diploma thesis-

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SAŽETAK

Kateholamini predstavljaju ključne regulatorne molekule u fiziologiji domaćih životinja, a njihova uloga posebno dolazi do izražaja u stanjima akutnog i hroničnog patofiziološkog opterećenja. U ovom radu analizirani su molekularni mehanizmi sinteze, skladištenja i oslobađanja adrenalina, noradrenalina i dopamina, te njihova integrativna funkcija u neuroendokrinoj i imunološkoj regulaciji. Poseban naglasak stavljen je na poremećaje kateholaminske signalizacije, uključujući disregulaciju sinteze, receptorne promjene i metaboličke disfunkcije, koji predstavljaju zajedničku patofiziološku osnovu niza kliničkih stanja u veterinarskoj medicini. Prikazani su i razlozi zbog kojih poremećaji kateholaminskog sistema dovode do kardiovaskularnih, respiratornih, gastrointestinalnih i metaboličkih komplikacija. Također, se obrađuje doprinos razvoju imunološke disfunkcije i hroničnog sistemskog stresa. Analizirani grafički modeli u radu prikazuju obrasce hormonskih promjena u šoku, stresu i endokrinim poremećajima, čime se naglašava povezanost između neuroendokrine regulacije i kliničkih manifestacija bolesti. Rezultati analize pokazuju da je razumijevanje kateholaminske dinamike ključno za pravilno tumačenje patofizioloških procesa i donošenje terapijskih odluka u veterinarskoj praksi. Rad potvrđuje da su postavljeni ciljevi u potpunosti ostvareni, te da integracija dostupnih podataka iz fiziologije, patofiziologije i kliničkih disciplina omogućava sveobuhvatan prikaz uloge kateholamina u zdravlju i bolesti životinja.

Ključne riječi: Kateholamini, patofiziologija, stres, adrenergički receptori, neuroendokrini sistem, šok, veterinarska medicina

SUMMARY

Catecholamines constitute essential regulatory molecules in the physiology of domestic animals, with their role becoming particularly prominent during acute and chronic pathological conditions. This paper examines the molecular mechanisms underlying the synthesis, storage, and release of adrenaline, noradrenaline, and dopamine, as well as their integrative function within neuroendocrine and immune regulation. Special attention is given to disturbances in catecholamine signalling, including altered synthesis, receptor desensitization, and metabolic dysregulation. These disturbances, represent core pathophysiological mechanisms in various clinical conditions encountered in veterinary medicine. The paper further discusses how dysregulated catecholamine activity contributes to cardiovascular, respiratory, gastrointestinal, and metabolic complications, as well as to immune dysfunction and chronic systemic stress responses. The graphical models included illustrate hormonal dynamics in shock, stress responses, and endocrine disorders, highlighting the relationship between neuroendocrine control and clinical presentation. The analysis demonstrates that understanding catecholamine dynamics is crucial for interpreting pathophysiological processes and making informed therapeutic decisions in veterinary practice. The study confirms that the defined research objectives were fully achieved and that the integration of physiological, pathophysiological, and clinical evidence provides a comprehensive overview of the role catecholamines role in health and disease in domestic animals.

Key words: Catecholamines, pathophysiology, stress, adrenergic receptors, neuroendocrine system, shock, veterinary medicine