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Action of alpha-Adrenoceptors in Liver Blood Flow Regulation during Treadmill Exercise in Dogs

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Abstract

The purpose of this study was to determine how the liver blood flow is maintained during running in dogs and to examine the sympathetic system that regulates hepatic circulation during dynamic exercise. Heart rate (HR), mean blood pressure (MBP), superior mesenteric arterial flow (SMAF), the external iliac arterial flow (EIAF), the hepatic arterial flow (HAF), and the portal venous flow (PVF) were measured during treadmill exercise at 8km/h with a 9% grade. HR, MBP, and EIAF increased significantly, while SMAF and PVF decreased significantly during exercise. HAF fell slightly, but not significantly. This response of HAF was reduced significantly by pretreatment with yohimbine and was eliminated by combining prazosin with the yohimbine. PVF responses were unmodified by alpha_1 and/or alpha_2 adrenoceptor blockers. These results suggest that blood flow to the splanchnic organs of the dog was decreased, while HAF was kept constant by a negative feedback mechanism mediated by the presynaptic alpha_2-adrenoceptor during dynamic exercise.