

原著

高強度運動が肝機能検査成績に及ぼす影響

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Effect of Submaximal Exercise on Hepatic Function

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Abstract

We attempted to clarify the effect of submaximal exercise on liver functions, using the following experimental design: Sprague-Dawley rats were divided into two groups; a control group and a submaximal-exercise group. Portal venous flows were determined by making a long-term implantation of an electromagnetic flowprobe during exercise. Serum levels of guanase (S-GA), hyaluronate (S-HY), GOT (S-GOT), GPT (S-GPT), CPK (S-CPK), and LDH (S-LDH) were measured immediately after exercise. The results were obtained as follows; 1) The portal venous flow significantly decreased in 5 min, and the blood flow remained decreased continued during the rest of exercise period. 2) S-GOT, S-GPT, S-CPK activities increased ($p < 0.05$) after submaximal exercise, but S-LDH did not increase. There was a significant increase in S-GA level ($p < 0.05$). We compared the difference in S-HY level between portal and hepatic venous bloods (p-v HY diff.). The p-v HY diff. was significantly lower in submaximal exercise group than in the control group ($p < 0.05$). Our findings suggest that the decrease of portal venous flow leads to

the increase in release of enzymes from hepatocyte and the decrease in uptake of HY by hepatic sinusoidal endothelia during the submaximal exercise. Thus, submaximal exercise affects the functions of both of hepatic sinusoidal endothelia and hepatocytes.

要約

本研究では、高強度運動が肝機能に及ぼす影響を検討することを目的とし、Sprague-Dawley系雄性ラット5匹を用いて高強度運動時の肝門脈血流変化を捉え、さらに血清 GOT, GPT, CPK, LDH 活性値などの肝機能検査に加えて、肝障害を特異的に反映するとされる血清グアナーゼ活性と、血清ヒアルロン酸の分析を行った。(1) 高強度運動は、運動開始後5分以降に、門脈血流量を有意に減少させた。(2) 肝機能検査では、血清 GOT, GPT, CPK 活性はともに高強度運動によって有意に上昇した($p < 0.05$)が、血清 LDH 活性は変化を認めなかった。高強度運動は血清グアナーゼ活性を有意に上昇させた($p < 0.05$)。血清 HY濃度は、肝門脈血清HY濃度から肝静脈血清HY濃度を差し引いた HY uptake で比較すると高強度運動群で有意に低値($p < 0.05$)を示した。これらの結果から、高強度運動は、肝門脈血流量を減少させ、肝実質細胞、及び類洞細胞の機能に影響を及ぼすことが示唆された。
