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跑台运动训练对apoE基因敲除小鼠高同型半胱氨酸血症及氧化应激的影响

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摘要：

摘要目的：研究跑台有氧运动训练对血浆同型半胱氨酸（Hcy）水平及氧化应激的影响，探讨其可能机制，为进一步探寻延缓高同型半胱氨酸血症（HHcy）致动脉粥样硬化的有效方法提供依据。方法：6周龄雌性apoE-/-小鼠随机分为三组：对照组、HHcy组和HHcy＋有氧运动组。饮用水中加入Hcy（1.8g/L）制作HHcy模型。HHcy＋有氧运动组在1周适应性训练后进行8周跑台训练（0°，15m/min，60min/d，每周训练5天，间隔2天）。采用酶法检测血浆Hcy及血脂水平。羟胺法试剂盒检测血浆超氧化物歧化酶（SOD）活性。结果：与对照组相比，HHcy组血浆Hcy水平明显增高（P=0.001），HHcy＋有氧运动组血浆Hcy水平较HHcy组明显下降（P=0.016）。三组之间体重增长，饮水量及血浆总胆固醇、低密度脂蛋白、高密度脂蛋白、甘油三酯水平差异无显著性意义。HHcy组小鼠血浆SOD活性较对照组显著降低（P=0.014），而有氧运动使HHcy小鼠血浆SOD活性明显增高(P=0.035)。结论：有氧运动可以降低HHcy apoE-/-小鼠血浆同型半胱氨酸水平，延缓同型半胱氨酸血症，上调氧化应激因子表达水平，改善氧化应激水平，而且该作用独立于血脂水平的改变。

关键词：跑台训练 有氧运动 高同型半胱氨酸血症 血脂 氧化应激

Influences of treadmill exercises training on hyperhomocysteinemia and anti-oxidant agent in ApoE knockout mice

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Fund Project:

Abstract:

Abstract Objective:To investigate the influences of aerobic exercise on hyperhomocysteinemia (HHcy) and superoxide dismutase(SOD) activities in apoE-/- mice and to explore its mechanism. Method: Six-week old female apoE-/- mice were assigned to three groups: control group, HHcy group and HHcy+exercises group. HHcy animal model was made by feeding high Hcy chow (1.8g/L in water). After 1 week of acclimatization, HHcy+exercises group was trained on a motorized rodent treadmill for 8 weeks (speed: 15m/min, slope: 0°, 60min/d, 5d/week). Plasm Hcy level and lipid level were measured enzymatically by auto-biochemistry analysis system. Plasm SOD activities were determined by hydroxylamine assay kit. Result: Plasm Hcy level in HHcy group were significantly higher than that in control group (P=0.001), Hcy level decreased significantly in HHcy+exercises group compared with HHcy group (P=0.016). There was no significant difference in body weight, daily drinking amount, plasm total cholesterol, LDL-C, HDL-C and triglyceride concentrations in three groups. Compared with control group, plasm SOD activities were lower in HHcy group (P=0.014); however, it increased in HHcy+exercises group significantly(P=0.035). Conclusion: Aerobic exercise could decrease plasm Hcy level and up-regulate the expression of anti-oxidant agent in HHcy apoE-/- mice, which does not depend on the decrease of cholesterol level.

Keywords: treadmill training aerobic exercise hyperhomocysteinemia blood lipid oxidative stress

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