

论著

兔饮食所致高同型半胱氨酸血症血管内皮功能的实验研究

边云飞¹,高吊清²,高奋¹,肖传实¹

1 山西医科大学第二医院心内科, 山西 太原 030001, 2山西省儿童医院心内科, 山西 太原 030013

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摘要 目的: 观察高同型半胱氨酸血症对血管内皮功能的影响。方法: 建立兔高同型半胱氨酸血症模型。将18只新西兰兔随机分为: 正常对照组(control组)6只、高蛋白饮食组(M组)12只; 于实验第4周始, 将M组再随机分为两组, M+O组6只, 继续饲高蛋白饮食; M+F组6只, 在高蛋白饮食基础上, 再加以叶酸、VitB12, 继续观察3周; 6周时统一处死动物, 取腹主动脉, 制备主动脉血管环, 比较M+O组与M+F组及C组主动脉血管对Ach的最大舒张反应。同时, 对3组高同型半胱氨酸血症形成过程中0周、3周、6周时血清中Hcy、ET-1、Ang-II、NO₂⁻/NO₃⁻、NOS各指标及处死动物时局部血管组织中ET-1、Ang-II、NO₂⁻/NO₃⁻、NOS指标进行检测并比较。结果: (1) M+O组主动脉血管对Ach的最大舒张反应性(E_{max}=26.73±4.51)低于M+F组(E_{max}=47.84±5.62, P<0.05)及control组(E_{max}=56.42±7.82, P<0.05); (2) 3周时, M+O组及M+F组血清中Hcy、ET-1、Ang-II各指标均明显高于对照组及0周时(P<0.05); NO₂⁻/NO₃⁻、NOS明显低于对照组及0周时(P<0.05); (3) 6周时, M+O组上述指标继续升高; M+F组血清中Hcy低于M+O组(P<0.05); NO₂⁻/NO₃⁻、NOS高于M+O组(P<0.05); ET-1、Ang-II各指标与M+F组无明显差异(P>0.05)。结论: 高同型半胱氨酸血症对血管内皮最大舒张功能具有明显的抑制作用; 其机制可能是通过影响局部血管组织内皮细胞 ET-1、Ang-II、NO的分泌而发挥作用的; 早期以叶酸、VitB12干预治疗对血管内皮功能具有一定的拮抗作用。

关键词 [高同种半胱氨酸血症](#); [内皮,血管](#); [叶酸](#); [维生素B12](#)

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Effect of hyperhomocysteine on endothelial cell function in rabbits

BIAN Yun-fei¹, GAO Diao-qing², GAO fen¹, XIAO Chuan-shi¹

1Department of Cardiology, The Second Hospital, Shanxi Medical University, Taiyuan 030001, China;

2Department of Cardiology, Shanxi Children's Hospital, Taiyuan 030013, China

Abstract

AIM: To investigate the effect of hyperhomocysteine on endothelial cell function. METHODS: By establishing hyperhomocysteinemia model, 18 male New Zealand rabbits were divided into control group (control group) and high-methionine-diet group (M group). At the end of 3 weeks, M group was divided again into M+O group (continuing high methionine-diet) and M+F group (high-methionine-diet plus folic acid, vitamin B12). At the end of 6 weeks, isolated aortic rings were made and the maximum vasodilation of the aortic rings to Ach was investigated. Meanwhile, the plasma concentrations of Hcy, NO, ET-1, Ang II at 0 week, 3 weeks and 6 weeks and the contents of NO₂⁻/NO₃⁻, Ang II, ET-1, NOS in regional vascular tissue at 8 weeks were also measured. RESULTS: (1) In contrast to M+F group and control group, the maximum vasodilation to Ach were decreased (E_{max}=26.73±4.51 vs 47.84±5.62, 56.42±7.82, P<0.05) in M+O group. (2) At the end of 3 weeks, the plasma concentration of Hcy, Ang II, ET-1 were increased in M group compared with C group and at 0 week (P<0.05), NO and NOS were decreased (P<0.05). (3) At the end of 6 weeks, the plasma concentration of Hcy, Ang II, ET-1 were continually increased in M+O group. In M+F group, by folic acid and vitamin B12 treatment, the level of Hcy was decreased compared with M+O group (P<0.05). The levels of NO and NOS were increased (P<0.05). However, ET-1, Ang II were not obviously changed. CONCLUSIONS: Hyperhomocysteinemia obviously restrains the endothelial vasodilation. The effect is initiated by changing the tissue regional level of ET-1, Ang II and NO. By early folic acid and vitamin B12

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treatment, the endothelial cell function may be protected.

Key words [Hyperhomocysteinemia](#) [Endothelium](#) [vascular](#) [Folic acid](#) [Vitamin B12](#)

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通讯作者 边云飞