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FOLIC ACID REDUCES ADHESION MOLECULES VCAM-1 EXPRESSION ON ENDOTHELIUM IN RATS WITH HYPERHOMOCYSTEINEMIA

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Objectives To investigate the effects of folic acid supplementation on the expression of adhesion molecules VCAM-1 in aortic endothelium of rats with hyperhomocysteinemia (HHCY) induced by ingestion of excess methionine (MET).

Methods Thirty male SD rats (200±20 g) were divided into 3 groups (n=10 in each group): control group (Control), high MET group (MET) and MET plus folate group (MET + folate). The rats were fed respectively on normal diet, normal diet enriched by 17 g/kg MET and normal diet plus 17 g/kg MET and 0.06 g/kg folate for 45 d. The levels of total plasma homocysteine (HCY) were detected and the expression of VCAM-1 protein and mRNA in aorta of rats was detected respectively by immunohistochemistry and RT-PCR.

Results The high-methionine diet resulted in a significant increase in the plasma HCY levels ((140.7±36.9) iamol/l vs (6.5±1.1) iamol/l). The serum HCY levels were significantly lower in rats fed on high-methionine plus folate-rich diet than those in rats fed on the high-methionine diet (50.6±21.8) iamol/l vs (140.7±36.9) iamol/l, p<0.05. The expression of adhesion molecules VCAM-1 at protein and mRNA levels was higher in aortic endothelium of rats fed on the high-methionine diet than that in control rats. The expression of VCAM-1 at protein and mRNA levels was significantly reduced in aortic endothelium of rats fed on high-methionine plus folate-rich diet compared with that in rats fed on high-methionine diet.

Conclusions A high methionine diet for 45 d is sufficient to induce HHCY. Folate supplementation to the rats fed on the high-methionine diet prevents the elevation of HCY levels in the blood and reduces the expression of adhesion molecules VCAM-1 in aorta of rats with HHCY.