AIM: Hyperhomocysteinaemia (Hhcy) is known to be an independent risk factor for vascular disease. Coronary flow reserve (CFR) measured by positron emission tomography (PET) is a sensitive method to monitor the effects of pharmacologic interventions in Hhcy. We assessed coronary vascular reactivity by PET in patients with coronary artery disease (CAD) dependent on their homocysteine (Hcy) levels before and under high dose folic acid supplementation therapy (FAST).

METHODS: Twelve patients with CAD underwent rest/adenosine (13) N-ammonia PET for quantification of myocardial blood flow (MBF) and CFR before and after nine weeks FAST (10 mg/day). RESULTS: Folate levels increased from 21 +/- 6 to 210 +/- 34 microg/l (+900%, p< 0.0001) while Hcy levels decreased from 12.1 +/- 3.6 to 9.1 +/- 3.1 micromol/l (- 25%; p< 0.01). Global resting MBF remained nearly unchanged after FAST, while stress MBF (from 2.61 +/- 0.93 to 3.25 +/- 1.15 ml/g/min; p = 0.05) and CFR (from 3.00 +/- 0.76 to 3.72 +/- 0.93 ml/g/min; p< 0.05; +24%) significantly increased in patients with normal and elevated Hcy levels (cut off 12 micromol/l). An inverse relation was found between Hcy and CFR (R = - 0.53; p = 0.08) and between Hcy and MBF at rest (R = - 0.62; p< 0.05) at baseline conditions, not persisting.
after FAST. CONCLUSION: Coronary vascular reactivity can be improved by FAST in patients with CAD and normal or elevated Hcy levels. FAST might lower an increased cardiovascular risk in CAD patients possibly by mechanisms that are not related to Hcy.