Objectives  Essential hypertensive patients with elevated homocysteine in plasma, which is called H-type hypertension, has a high incidence in Chinese population; Though a point mutation in methylenetetrahydrofolate reductase (MTHFR C677T) has been associated with increased plasma homocysteine (Hcy) levels, pathogenetic mechanisms involved are still a matter of debate. Therefore, our study was designed to explore the influence of genetic and lifestyle factors on H-type hypertension risk in the rural area of Anqing, China.

Methods  We used PCR- restriction fragment length polymorphism (PCR-RFLP) to determine C677T polymorphism in MTHFR gene in hypertension patients. Then based on the three types of MTHFR genotypes (CC, CT&TT), we enrolled 241 cases of hypertension in total and each genotype had nearly equal number patients (n=76, 85&80). Then we examined the plasma Hcy level with HPLC, measured blood pressure with Standard Desktop mercury Sphygmomanometer and calculated the body mass index (BMI). A questionnaire was used to collect the lifestyle information of cigarette and/or alcohol consumption status.

Results  1. The average level of plasma Hcy was significantly higher in male than female (12.8±7.2 umol/l vs 9.7±4.7 umol/l, p<0.01); Patients with TT genotype had a significantly higher level of Hcy than those with CC or CT genotypes (p<0.01).
2. The proportion of H-type hypertension in all the hypertension cases was up to 44.4%. H-type hypertension was much more common in male patients, which was 60.3% compared to 29.6% in female. The risk of H-type hypertension in TT genotype was pronouncedly higher than in CT and CC genotypes (OR 3.2, 95% CI 1.7 to 5.8, p<0.01).
3. Multiple linear/logistic regression analysis with adjustment by multivariate didn’t identify marked relevance of Hcy level or H-type hypertension risk with other environmental variables including age, alcohol drinking, cigarette smoking, BMI, and baseline DBP and SBP.

Conclusions  Our present study suggested that the MTHFR C677T genetic variant may be associated with a high risk of H-type hypertension, but not for drinking, smoking, age, BMI and blood pressure, in rural community of Anqing, China.