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Influence of Polymorphism of the Angiotensin-Converting Enzyme Gene on Arteriovenous Shunt Obstruction in Maintenance Hemodialysis Patients

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Backgroud: Neointimal hyperplasia and thrombosis are the major factors responsible for vascular access occlusion. Previous studies suggested that the renin-angiotensin system has been implicated in the pathogenesis of neointimal hyperplasia and thrombosis. Recent studies have shown that angiotensin-converting enzyme(ACE) gene polymorphism may have a association with venous thrombosis. I conducted a retrospective case control study to determine the influence of ACE gene polymorphism on the progression of native arteriovenous(AV) shunt thrombosis. Also, I investigated the association between ACE polymorphism and various thrombotic factors in thrombosed and nonthrombosed subjects..

Method: 56 patients (24 males and 32 females, mean age 49.8, age range 12-81) whose radiocephalic AV shunt was in good function after 1 month of vascular access operation participated in this study. Lipoprotein(a), total cholesterol, triglyceride, and homocystein were measured before hemodialysis session in fasting state. Clinical data such as body mass index(BMI), cigarette smoking, hypertension, diabetes were retrieved from patient's records. The ACE genotype was analyzed by the polymerase chain reaction(PCR).

Results: The frequencies of diabetes and cigarette smoking were similar in the three genotypes. There were no significant differences in BMI, total cholesterol, lipoprotein(a) and homocystein (p=0.551, 0.429, 0.279, 0.124, respectively) among DD, ID and II genotypes. The frequencies of the DD, ID and II genotypes were 16%, 43%, 41%, respectively. Compared with the ID and II genotypes, the frequency of DD genotype in the thrombosed AV shunts was higher than that of the nonthrombosed. But there was no statistically significant difference between ACE polymorphism and AV shunt thrombosis(2=1.027, df=2, p=0.598).

Conclusion: ACE polymorphism has some influence on the vascular access occlusion in maintenance hemodialysis patients, but factors other than that, such as infection of AV shunt site, false aneurysm formation, and characteristics of the dialysis staff, may also play more important roles in native vascular access longevity.