Angiotensin converting enzyme insertion/deletion gene polymorphism is associated with acquired sick sinus syndrome via linking a higher serum protein level

Jan-Yow Chen
Ying-Ming Liou
Kuan-Cheng Chang

Introduction: The replacement of nodal tissue with fibrotic tissue has been reported to play an essential role in the pathogenesis of acquired sick sinus syndrome (SSS). The activated atrial renin-angiotensin system (RAS) has been linked to atrial fibrosis and modification of ion channels, all of which can contribute to the abnormal pacemaker function of the sinus node. Angiotensin converting enzyme gene insertion/deletion (ACE I/D) polymorphism has been shown to modulate the expression of RAS genes. However, it remains to be determined whether ACE is involved in the pathogenesis of acquired SSS.

Methods: The study included 110 SSS patients and 124 controls (matched for age and gender). Genotypes of the ACE I/D gene polymorphism were determined using the polymerase chain reaction-fragment length polymorphism assay, followed by an association study. An enzyme-linked immunosorbent assay was used to determine the serum level of ACE.

Result: The association study indicated that the ACE I/D polymorphism is linked to acquired SSS. Compared with the controls, the acquired SSS patients had a significantly higher frequency of the D dominant ID/DD genotypes than the controls (79/110 vs. 62/124, OR 2.548, CI 1.478-4.393, P = 0.001). In addition, the D allele frequency was significantly higher in the SSS group than in the controls (87/220 vs. 74/248, OR 1.538, CI 1.048-2.257, P = 0.028). Consistently, the ID/DD genotypes showed a higher ACE serum level than the II genotype (4.25 ± 2.50 ng/ml vs. 2.71 ± 1.76 ng/ml, P = 0.028) in controls.

Conclusion: The ACE I/D gene polymorphism, correlated with a higher serum ACE level, is associated with the disease susceptibility to acquired SSS.