Heart Rate Control Resistant Minor Allele of GJA-1 Gene Polymorphism in Patients with Persistent Atrial Fibrillation

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Introduction: Beta-blockers are the first-line rate control therapy in patients with atrial fibrillation (AF). However, several patients show drug resistant. The previous genome-wide association studies identified single nucleotide polymorphisms (SNPs) associated with heart rate (HR). We hypothesized that these HR-associated SNPs were related to HR control in AF patients.

Methods: We enrolled 395 patients with persistent AF who took equal amount of β-blocker. We genotyped HR-associated SNPs in all the AF patients. They underwent 24-hour Holter monitoring and electrophysiological study.

Result: Only the GJA-1 SNP (rs1015451, C>T) was associated with total HR in patients with persistent AF after Bonferroni correction. (Table) In addition, the conduction times of the right and left atriums were shorter in AF patients with GJA-1 SNP minor allele C than those without. (Figure)

Conclusion: The GJA-1 SNP, a coding gap junction protein (CX43), may be related to resistivity of HR control in AF patients.