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Arrhythmias

HYPERURICEMIA IS AN INDEPENDENT RISK FACTOR OF ATRIAL FIBRILLATION DUE TO ELECTRICAL REMODELING THROUGH ACTIVATION OF URIC ACID TRANSPORTER

ACC Moderated Poster Contributions
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Session Title: Arrhythmias: AF/SVT- Emerging Risk Factors for Atrial Fibrillation
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Objectives and Methods: Uric acid transporter1 (URAT1) is proposed to play a pivotal role of hyperuricemia-induced cardiovascular-renal disease. We hypothesized that hyperuricemia can impair the ion channel expression of atrial myocytes to induce electrical remodeling, contributing to atrial fibrillation (AF) using both epidemiological study composed of cross-sectional study and cohort study in 90,143 Japanese people (male:49.1%, age:46.3±12.0 years) and experimental study.

Results: 1) Uric acid is the independent predictor of AF. Cross sectional study showed that the level of uric acid (UA≥8.0 mg/dl) was the independent predictor of AF (OR:2.90, p<0.001). The prevalence of AF was significantly smaller in patients with uric acid lowering agents than that in patients without them. Cohort study indicated that UA increased from 5.91 to 6.28(p<0.001) between a last year and the year of the first detecting AF, suggesting the involvement of UA to occurrence of AF. 2) Uric acid impaired the ion channel expression through URAT1. UA at 9mg/dl significantly increased the mRNA level and protein level of Nav1.5, Kv1.5 and HERG channels in HL-1 mouse atrial cells. URAT1 inhibitors restored the UA-induced increase of both protein and mRNA level of these ion channels, indicating the involvement of URAT1 to facilitate uric acid-induced electrical remodeling.

Conclusions: Hyperuricemia induces the atrial electrical remodeling through activation of URAT1, which may cause AF.