

Effects of aging and ouabain on left atrial arrhythmogenicity

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摘要

Abstract

OBJECTIVES: Aging increases atrial fibrillation (AF) vulnerability. The left atrium (LA) is important for the generation of AF. However, the effect of aging on the electrophysiological properties of the LA in general, on the specific LA sites, and of possible accentuation of regional differences between the LA sites with aging is not clear. The purpose of this study was to evaluate the effects of aging on the LA electrophysiological heterogeneity and ouabain-induced arrhythmogenicity. **METHODS:** We used conventional microelectrodes to record the action potentials (APs) in isolated young (age, 3 months) and aged (age, 3 years) rabbit LA posterior wall (LAPW) and LA appendage (LAA) tissue specimens before and after the administration of ouabain. **RESULTS:** Young LAPWs ($n = 10$) had larger AP amplitudes than young LAAs ($n = 10$, $P < 0.05$), and aged LAPWs ($n = 9$) had longer AP durations than aged LAAs ($n = 9$, $P < 0.05$). Ouabain (1 μM) induced a higher incidence (80% vs 30%, $P < 0.05$) of delayed afterdepolarizations (DADs) and spontaneous activity (60% vs 10%, $P < 0.05$) in the young LAPWs than in the young LAAs. Compared with the young group, the aged LAs had a higher incidence of DADs with a less negative resting membrane potential and smaller maximum upstroke velocity. After the ouabain (1 μM) administration, the aged LAPWs had a greater shortening of the AP duration. Ouabain-induced spontaneous activity was similar between the young and aged groups. **CONCLUSIONS:** Aging enhanced the LA regional electrical heterogeneity and LAPW arrhythmogenesis.