



Protective effects of simvastatin on atrioventricular node during simulated experimental atrial fibrillation *in vitro*

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Abstract

Introduction: Recent evidence has indicated that statins can reduce the incidence of both supraventricular and ventricular arrhythmias with various mechanisms. The primary goal of the present study was to determine direct protective role of simvastatin in modifying concealed conduction and the zone of concealment in a simulated model of atrial fibrillation (AF) in an isolated atrioventricular (AV) node in rabbits.

Methods: Male Newland rabbits (1.5-2 kg) were used in all experiments. Stimulating protocols (recovery, AF, zone of concealment) were used to study electrophysiological properties of the node in one group (N=8). All of the stimulated protocols were repeated in the presence and absence of different doses of simvastatin (0.5-10 μM). Results were shown as mean \pm S.E.

Results: Significant inhibition of the basic properties of the AV node was observed after the addition of simvastatin. Significant prolongation of Wenckebach index (wbcl) from 138.7 ± 5.6 to 182.1 ± 6.9 and functional refractory period (FRP) from 157.7 ± 5.9 to 182.1 ± 6 msec at the concentration of 10 μM was observed. Maximum efficacy of simvastatin in atrial fibrillation (AF) protocol was observed at the concentration of 3.10 μM , that was accompanied with prolonged HH interval and increased number of concealed beats. Zone of concealment significantly increased at the concentrations of 1.3 and 10 μM .

Conclusion: This study shows the protective effect of simvastatin in the prolongation of ventricular beats during atrial fibrillation. The effect of simvastatin in increasing AV-nodal refractory period and zone of concealment are probably the anti-arrhythmic mechanisms of this drug.

Key words: AV-node, Atrial fibrillation, Simvastatin, Arrhythmia

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