Abstracts

EFFECTS OF SIMULATED ISCHEMIA-REPERFUSION AND ATORVASTATIN ON INA IN RAT LEFT VENTRICULAR MYOCYTES.

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Objective To observe time dependent effects of simulated ischemia-reperfusion on transient sodium currents ($I_{Na}$) in rat left ventricular myocytes, and effects of atorvastatin on $I_{Na}$ in the condition of ischemia and reperfusion.

Methods Fifty-four Wistar rats were used for isolating left ventricular myocytes, which were randomly divided into four groups: ischemia group (normal→ischemia→ischemia), reperfusion group (normal→ischemia→reperfusion), statin-ischemia group (normal→ischemia with 5 μmol/l atorvastatin) and statin-reperfusion group (normal→ischemia→reperfusion with 5 μmol/l atorvastatin). Firstly, $I_{Na}$ were recorded in normal $I_{Na}$ solution (for control) by whole-cell patchclamp. Then, in simulated ischemia solution, $I_{Na}$ were recorded from 3 min to 21 min. Finally, $I_{Na}$ were recorded again in normal $I_{Na}$ solution (simulate reperfusion).

Results (1) Ischemia effects: In ischemia group, compared with normal (0.95±0.04), normalised currents (at −40 mV) of simulated ischemia were increased to peak at 3 min (1.15±0.08, p<0.01), returned at 9 min and 11 min (0.98±0.12 and 0.92±0.12, p>0.05, respectively), and decreased at 21 min (0.56±0.13, p<0.01). At simulated ischemia for 21 min, there were no significant differences among ischemia group, reperfusion group and statin-reperfusion group. (2) Effects of atorvastatin on ischemia myocytes: in statin-ischemia group, there were no differences between normal and simulated ischemia for 3 min (0.97±0.04 vs 0.92±0.12, p=0.05). (3) Reperfusion effects: compared with ischemia for 21 min, normalised currents (at −40 mV) in reperfusion group were decreased at reperfusion for 3 min from 0.83±0.11 to 0.57±0.09 (p<0.05), and decreased to 0.50±0.09 at reperfusion for 9 min (compared with 3 min p<0.05), while in ischemia group normalised currents were not changed again. And compared with ischemia group, normalised currents (at −40 mV) in reperfusion group were decreased at reperfusion for 3 to 9 min (p<0.01). (4) Effects of atorvastatin on reperfusion myocytes: compared with ischemia for 21 min, normalised currents (at −40 mV) in statin-reperfusion group were decreased at reperfusion for 3 min from 0.92±0.04 to 0.72±0.05 (p<0.01). And at reperfusion for 3 to 9 min, normalised currents in statin-reperfusion group were decreased compared with ischemia group, but increased compared with reperfusion group (p<0.01, respectively).

Conclusions (1) The effects of simulated ischemia on $I_{Na}$ are time dependent, while $I_{Na}$ is transient increased at 3 min, but decreased 21 min (2) Simulated reperfusion make $I_{Na}$ more decreased from ischemia condition. (3) Atorvastatin can depress increased $I_{Na}$ at the period of early ischemia, and depress decreased $I_{Na}$ at the time of reperfusion.