

Public Abstract

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Title:THE ROLE OF SODIUM-CALCIUM EXCHANGER IN THE ELECTRICAL ACTIVITY OF EMBRYONIC CHICKEN HEART

Heart is one of the most important organs of the body and also it is one of the first organs during to the development. The electrical activity of heart is essential for its function. Hence it is very important to understand the role of different ion channels and transporters which shape the electrical activity of heart. It has been shown that the sodium-calcium exchanger (NCX) is an important exchanger for calcium homeostasis. We hypothesize that the NCX may be present during development. To test this hypothesis we recorded the spontaneous electrical activity of heart from the embryonic chicken heart before and after blocking NCX during different stages of development with different concentration of KB-R7943. We analyzed the data for changes in amplitude, duration, and maximum rate of rise, rise time and decay time of AP. We found that the blocking of this exchanger does have significant effect on the amplitude and the rise time of AP. We found out that changes in duration of AP were less in atrium in early stages of development and increased during later stages of development. Interestingly these results were opposite in ventricles where increase in duration of AP was more during early stages of development and decreased during later stages of development. Similarly there was an increase in decay time of atrium and ventricular action potential at different stages of development. There were relatively few very significant changes in rise time of AP. Hence it is quite apparent that the blocking of NCX affects the plateau phase of AP or the calcium extrusion phase. Also the different changes in atrium and ventricular duration effects can not be understood completely. We carried out RT-PCR experiments to evaluate the presence of mRNA expression of NCX and we found that it is almost constant in atrium from early to elder stages of development where as there was increase in amount of mRNA expression in ventricles. It is also certain that NCX is one of the exchangers present in early embryonic hearts to actively play role in shaping the electrical activity.