Functional evidence for alterations in intracellular Ca2+ handling.

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Abstract:
Post-rest contractile behavior of isolated myocardium indicates the capacity of the sarcoplasmic reticulum (SR) to store and release Ca2+. We investigated post-rest behavior in isolated muscle strips from nonfailing (NF) and endstage failing (dilated cardiomyopathy [DCM]) human hearts. At a basal stimulation frequency of 1 Hz, contractile parameters of the first twitch after increasing rest intervals (2-240 s) were evaluated. In NF (n = 9), steady state twitch tension was 13.7 +/- 1.8 mN/mm2. With increasing rest intervals, post-rest twitch tension continuously increased to maximally 29.9 +/- 4.1 mN/mm2 after 120s ($P < 0.05$) and to 26.7 +/- 4.5 mN after 240 s rest. In DCM (n = 22), basal twitch tension was 10.0 +/- 1.5 mN/mm2 and increased to maximally 13.6 +/- 2.2 mN/mm2 after 20 s rest ($P < 0.05$). With longer rest intervals, however, post-rest twitch tension continuously declined (rest decay) to 4.7 +/- 1.0 mN/mm2 at 240 s ($P < 0.05$). The rest-dependent changes in twitch tension were associated with parallel changes in intracellular Ca2- transients in NF and DCM (aequorin method). The relation between rest-induced changes in twitch tension and aequorin light emission was similar in NF and DCM, indicating preserved Ca (2-)-responsiveness of the myofilaments. Ryanodine (1 microM) completely abolished post-rest potentiation. Increasing basal stimulation frequency (2 Hz) augmented post-rest potentiation, but did not prevent rest decay after longer rest intervals in DCM. The altered post-rest behavior in failing human myocardium indicates disturbed intracellular Ca2- handling involving altered function of the SR.

Biography:

Sophie kuve is a researcher and student in October university in Cairo. She is uniquely trained and has a philosophy on how to manage research. She is an Honorable Editorial Board Member for many International Journals.

Recent Publications:

1. Circ Cardiovasc Imaging. Author manuscript; available in PMC 2010 Mar 1. Published in final edited form as: Circ Cardiovasc Imaging.
2. Ca loading in cardiac muscle preparations based on rapid-cooling contractures.
3. Force-interval relations of twitches and cold contractures in rat cardiac trabeculae. Effect of ryanodine.
4. The failing human heart is unable to use the Frank-Starling mechanism.

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