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Die Ein-Jahres-Entwicklung der spezifischen Psychopathologie der Bulimia nervosa unter Behandlung - Eine methodenkritische klinische Studie

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Summary

Human right atrial myocardiums loaded with the fluorescent dye fura-2 were electrically stimulated to investigate the force-frequency relationship and intracellular calcium handling under isometric contraction and isotonic shortening at the physiological temperature (37°C) and stimulation frequency (0.5-3.0 Hz). The following results are given:

[1] Isometric tension and isotonic shortening or shortening velocity gradually increase with increasing the frequency of stimulation, which is associated with a parallel enhancement of calcium transients. Maximal tension and shortening occur at 2.0 Hz. The myocardium exhibits a positive force-frequency relationship.

[2] Maximal peak rates of tension increase and decrease occur at higher frequency and maximal increased amplitude as a percentage change is larger compared with isometric tension development.

[3] Time to peak shortening is slightly longer and relaxed time of shortening is obviously shorter compared to the isometric condition. Total time courses of tension and shortening are progressively reduced together as stimulation frequency is raised. However, isotonic shortening took less time than isometric contraction. This shortened time during isotonic shortening mainly contributes to the relaxed time.

[4] Time to peak calcium transient is slightly reduced and time to 50% decline of calcium transient is considerably shortened in both tension and shortening when stimulation frequency is increased. Time to peak calcium transient is slightly longer in isotonic shortening than in isometric tension at all frequency ranges. Time to 50% calcium decline of shortening is slightly longer at lower frequencies and that it is not different at higher frequencies is comparable to the isometric condition.

[5] Peak systolic calcium transients are obviously increased and diastolic calcium transients are slightly elevated with increasing the frequency for both tension and shortening. However, the increased amplitude of peak systolic calcium transients of shortening is obviously higher than that for isometric tension at higher frequencies. Diastolic calcium transients show no difference.

In conclusion, the present results further confirm previous observations that the peak calcium transients of isotonic shortening are higher and that the time course of peak calcium transients is longer; the time to peak shortening is slightly prolonged and relaxed time of shortening is obviously

shorter as compared with the isometric condition. This study also supports the hypothesis that a higher calcium transient during shortening is due to an increase in dissociation of the calcium from the contractile apparatus. The time course of the calcium transients determines the durations of mechanical behaviors of myocardium; higher calcium transients and a slightly prolonged time of peak calcium transients lead to a greater amplitude of shortening and a slightly longer time to peak shortening and a rapid dissociation of calcium from the contractile apparatus and an increased reuptake of calcium into the sarcoplasmic reticulum result in a quick relaxation during shortening.