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Titel des Beitrags: Autonomic cardiac control in animal models of cardiovascular diseases II. Variability analysis in transgenic rats with alpha-tropomyosin mutations Asp175Asn and Glu180Gly.

Abstract: Animal models of cardiovascular diseases allow to investigate relevant pathogenetic mechanisms in detail. In the present study, the mutations Asp175Asn and Glu180Gly in alpha-tropomyosin (TPM1), known cause familiar hypertrophic cardiomyopathy (FHC) were studied for changes in hemodynamic parameters and spontaneous baroreflex regulation in transgenic rats in comparison to transgenic and non-transgenic controls by telemetry. Heart rate variability (HRV) and blood pressure variability (BPV) were analyzed using time- and frequency domain, as well as non-linear measures. The dual sequence method was used for the estimation of the baroreflex regulation. In transgenic rats harboring mutated TPM1, changes in HRV were detected during exercise, but not at rest. Both mutations, Asp175Asn and Glu180Gly, caused increased low frequency power. In addition, in animals with mutation Asp175Asn a reduced total HRV was observed. BPV did not show any differences between all transgenic animal lines. During exercise, a strong increase in the number of bradycardic and tachycardic fluctuations accompanied with decreased baroreflex sensitivity (BRS) was detected in animals with either TPM1 mutation, Asp175Asn or Glu180Gly. These data suggest, that the analysis of cardiac autonomic
control, particularly of baroreflex regulation, represents a powerful non-invasive approach to investigate the effects of subtle changes in sarcomeric architecture on cardiac physiology in vivo. In case of mutations Asp175Asn or Glu180Gly in TPM1, early detection of alterations in autonomic cardiac control could help to prevent sudden cardiac death in affected persons.