

ABSTRACT

Cardiomyopathic changes in Streptozotocin-induced Diabetes Mellitus in rats.

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Diabetes mellitus is associated with several chronic complications, one of which is diabetic cardiomyopathy. In this pathology there is myocardial failure independent of hypertension or valvular disease. The underlying cause is thought to be fundamental changes in calcium (Ca^{2+}) handling in the diabetic myocardium.

In this thesis, the appearance of these events as distinct changes in the electrical properties of the heart as shown by the electrocardiogram (ECG) was investigated. Also by looking at the changes over set time intervals, an indication as to the progress of the pathology with time was established. The studies were done using *in vivo* preparations and also isolated heart preparations using a modified Langendorff apparatus. In the *in vivo* studies, blood pressure (BP), heart rate (HR), and P-R, QRS, Q-T₁ and Q-T₂ intervals were assessed and *in vitro*, HR, systolic pressure (SP), diastolic pressure (DP) and P-R, QRS intervals were assessed. In both set of experiments the influence of isoprenaline (IPNA), glyburide (GLY) and verapamil (VER) on the variables mentioned above were observed.

In both these studies it was found that there were significant differences in the parameters measured in the streptozotocin diabetic rats when compared to the normal rats. It was observed that the HR of the diabetic rats tended to be lower than that of the normal rats. It was also observed that there were distinct differences in the electrical parameters of the heart from the two groups of animals, when hearts were perfused with IPNA, GLY and VER and also when the drugs were administered as bolus injections *in vivo* preparations.

The observations are significant because they might be indicating that cardiomyopathic changes can be detected with careful analysis of the electrical and mechanical properties of the diabetic myocardium in streptozotocin-induced diabetes mellitus in rats.