

Meeting abstract

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The possible link between insulin resistance and increased cardiovascular mortality

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Introduction

Hyperinsulinaemia and insulin resistance are considered as independent risk factors of ischemic heart disease. We sought whether hyperinsulinaemia per se is of significant influence on cardiac arrhythmia generation in conscious rabbits.

Methods

Chronically instrumented conscious rabbits were equipped with a right ventricular electrode catheter for pacing and recording the intracavitary electrogram as well as with arterial and venous catheters for blood sampling, blood pressure monitoring and for insulin and glucose infusions, respectively. Hyperinsulinaemia was produced by 2-step hyperinsulinaemic (35.7 ± 7.4 and 103.2 ± 10.5 $\mu\text{U/ml}$) euglycaemic (5.5 ± 0.5 $\mu\text{U/ml}$) glucose clamping. Programmed electrical stimulation (PES) was applied for ventricular effective refractory period (VERP) determination and arrhythmia generation.

Results

The VERP shortened from 110.4 ± 3.7 to 104.8 ± 2.9 ms, ($p < 0.05$) and from 109.3 ± 2.9 to 101.4 ± 1.7 ms ($p < 0.05$) in animals with 35 and 103 $\mu\text{U/ml}$ clamped hyperinsulinaemic euglycaemia, respectively. The incidence of ventricular premature beats, non-sustained ventricular

tachycardia and sustained ventricular tachycardia induced by PES increased from control 11, 0, 0% to 24 ($p < 0.05$), 5, 0%; and 56, 44 ($p < 0.001$ for each), 0% in animals with 35 and 103 $\mu\text{U/ml}$ clamped hyperinsulinaemic euglycaemia, respectively.

Conclusion

The results provide evidence for the "sui generis" proarrhythmic effect of hyperinsulinaemia in otherwise healthy rabbits. The results also suggest that this is underpinned by a hyperinsulinaemia-induced reduction of VERP.