Influence of captopril on symptomatic and hormonal responses to hypoglycaemia in humans

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AIMS: Hypoglycaemic symptoms and hormonal counter-regulation are of high importance to avoid the risk of severe hypoglycaemia in patients with diabetes mellitus. Various antihypertensive drugs, such as angiotensin-converting enzyme (ACE) inhibitors, have been suspected for a long time to reduce this response to hypoglycaemia in diabetic subjects. Although ACE inhibitors are approved for controlling diabetic complications, previous investigations regarding this putative side-effect are controversial. METHODS: We performed clamp experiments in 16 healthy men lasting for 6 h each. The subjects were pretreated for 7 days with captopril 3 x 25 mg day⁻¹ vs placebo in a randomized, double-blind, crossover study. Plasma glucose was decreased in a stepwise manner during a hypoglycaemic clamp session and counter-regulatory hormones [epinephrine (adrenaline), norepinephrine (adrenaline), ACTH, cortisol, glucagon], symptoms, and haemodynamic parameters (blood pressure, heart rate) were measured. RESULTS: Counter-regulatory hormone concentrations significantly increased in both sessions (ACE inhibitor vs placebo) during hypoglycaemia. The rise of counter-regulatory hormones as well as symptom scores were equal under both ACE inhibitor and placebo treatment. Systolic blood pressure and heart rate increased (from 110 +/- 3 vs 115 +/- 3 mmHg to 132 +/- 4 vs 133 +/- 4 mmHg) whereas diastolic blood pressure slightly decreased (from 63 +/- 2 vs 70 +/- 2 mmHg to 61 +/- 2 vs 64 +/- 2 mmHg) independent of pretreatment. Systolic and diastolic blood pressure were significantly lower in the captopril session vs placebo (P < 0.05). CONCLUSIONS: Our results demonstrate that subchronic treatment with captopril does not attenuate symptomatic and hormonal response to hypoglycaemia. Thus, to patients at risk of hypoglycaemia who require antihypertensive or nephroprotective treatment, we would continue giving an ACE inhibitor.

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