Proinsulin C-peptide inhibits lipolysis in diabetic rat adipose tissue through phosphodiesterase-3B enzyme

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Abstract

We have previously reported that C-peptide modulates insulin-mediated inhibition of lipolysis and glucose consumption but has no significant effects per se on adipose tissue of normal rats. It has been repeatedly observed that certain actions of C-peptide are restricted to the diabetic states. In the present study, therefore, we examined whether C-peptide alters lipolysis in adipose tissue of diabetic rats. Rats were rendered diabetic by streptozotocin and divided into 2 groups; insulin treated and untreated. Retroperitoneal adipose tissue was excised aseptically, subjected to organ culture and incubated with rat C-peptide, insulin, or a combination of both peptides in the presence or absence of isoproterenol. Tissue lipolysis was assessed by the rate of glycerol release into the culture media. The cultures were pretreated with cilostamide, a phosphodiesterase-3B enzyme inhibitor, when the role of this enzyme was to be examined. C-Peptide on its own, like insulin, significantly inhibited isoproterenol-stimulated lipolysis in the adipose tissue of untreated diabetic rats. The effect was enhanced by a combination of C-peptide and insulin, or a combination of both peptides in the presence or absence of isoproterenol. Notably, the C-peptide's effect was totally blocked in the presence of cilostamide. In the adipose tissue of insulin treated rats, however, C-peptide failed to show any significant antilipolytic effects. These data show that C-peptide has the potential to act, conditionally, as an antilipolytic hormone by activating phosphodiesterase-3B and suggest that the action may contribute to the C-peptide's beneficial effects on diabetes-induced complications. © Georg Thieme Verlag KG Stuttgart · New York.

Author keywords

adipose tissue; C-peptide; type 1 diabetes

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