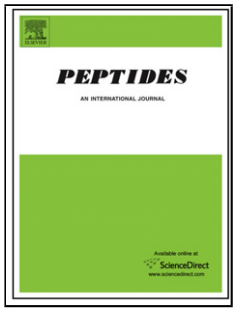

Title: Oxytocin is present in islets and plays a role in beta-cell function and survival

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Oxytocin is present in islets and plays a role in beta-cell function and survival

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Short title: Oxytocin and beta-cell function

Highlights

- Oxytocin and its related receptor are present in the endocrine pancreas
- Oxytocin augments insulin secretion
- Oxytocin has positive effects on beta-cell apoptosis and proliferation
- Insulin deficiency and resistance alter islet localisation of oxytocin

Abstract

Oxytocin is associated mainly with modulating reproductive function. However, studies suggest that oxytocin also plays a role in endocrine pancreatic function. In the present study, islet expression of oxytocin and its related receptor was confirmed in mouse islets as well as cultured rodent and human beta-cells. Oxytocin significantly stimulated glucose-induced insulin secretion from isolated mouse islets. Similar insulinotropic actions were also observed in rodent BRIN BD11 and human 1.1B4 beta-cells. Positive effects of oxytocin on insulin secretion were almost fully annulled by the oxytocin receptor antagonist, atosiban. In terms of mechanism of insulin secretory action, oxytocin had no effect on beta-cell membrane potential or cAMP generation, but did augment intracellular calcium concentrations. *In vivo* administration of oxytocin to mice significantly reduced overall blood glucose levels and increased plasma insulin concentrations in response to a glucose challenge. Oxytocin also had a modest, but significant, appetite suppressive effect. As