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The possible antidiabetic action of certain phosphodiesterase inhibitors in experimental rats

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Cyclic nucleotides play a pivotal role in the glucose-induced insulin release; however, the effect of phosphodiesterase inhibitors (PDEIs) is controversial. Hence, thestudy deals with possible antidiabetic action of phosphodiesterase inhibitors in rats.It is composed of in vivo and in vitro studies.In the in vivo study, diabetes was induced by injecting a single dose of streptozotocin(50 mg/kg) then2drugs; sildenafil (Sild),vinpocetine(Vinp) were used andgliclazide (Glicl) was used as a reference standardthendrugswere administered daily over 2 weeks. The chosen doses were 10 mg/kg for Glicl, 5, 10, 20 mg/kg for Sild, 10, 20, 40 mg/kg for Vinpthen glucose, insulin and C-peptide levels were estimated after 2 hours of first dose, 1 week and 2 weeks of drug administration. Also Liver glycogen was measured after 2 weeks. The aim of In vitrostudy was to construct a correlation between cGMP level and insulin release. To fulfill this aim, pancreatic islets were exposed to different concentrations of vinpocetine,sildinafil,orgliclazide alone or in combination. The effects of Vinp, Sild,Gliclwere studied individually in concentrations (10, 20, 40, 80 µmol/l) or in combinations for 1 hour on β-islets isolated by collagenase digestion technique in glucose (3 or 16.7 mmol/l) andreleased insulin and cGMP levels were estimated in incubation medium.Sildand Vinppossesantidiabetic action by their hypoglycemic, insulinotropic and increased glycogenetic effects. Their effects on insulin release confirmed in thein vitro study.Both increased cGMP level parallel to increase in released insulin which indicates,PDE1 inhibition is effective in augmenting insulin compared to that of PDE5.

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