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Insulin secretagogue activity of aqueous extract of *Momordica charantia* is partly due to increase in PKC activity in rat islets

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Momordica charantia (MC) fruits have previously been reported to reduce blood glucose in laboratory animals and human subjects with diabetes. Increase in insulin secretion is one of the chief mechanisms of antidiabetic action of MC extracts or their purified molecules. In present study the effect of aqueous extracts of MC (AEMC) was studied on insulin secretion in isolated pancreatic islets from normal Wistar rats with an attempt to evaluate the mechanism of action. Islets were incubated in HBBS buffer containing 3.3 or 16.7mM glucose, and AEMC, diazoxide, nimodipine and calphostin C, alone and in combinations. Release of insulin in external media was measured by ELISA. Cytotoxicity studies, to assess the integrity of the islets cells, were carried out by trypan blue uptake and LDH release assay. Trypan blue gained access to 9.6 ± 1.2% cells and 8.3 ± 1.1% dead islet cells were observed in LDH release assay on AEMC exposure, suggesting that the extract was non-toxic at tested concentration. AEMC stimulated insulin secretion from the isolated islets at 3.3 and 16.7 mM glucose. The effect of AEMC was dose dependent. As loss of cell integrity was not observed on AEMC exposure, hence, alteration of membrane integrity as the possible mechanism of insulin release is ruled out by this study. Addition of dizoxide and nimodipine completely diminished glucose induced insulin secretion. AEMC induced insulin secretion at 16.7mM glucose was partially inhibited by dizoxide and nimodipine, however no reduction was observed at 3.3mM of glucose. No change in insulin secretion at basal level of 3.3 mM of glucose suggests that the phytochemicals of AEMC may not be binding to either KATP or Ca channels. Calphostin C significantly ($p<0.01$) reduced AEMC induced insulin production both at 3.3 mM and 16.7 mM. The finding suggests that PKC inducing activity of AEMC phytochemical/s may be responsible for its insulin secretagogues potential.

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