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Oral sustained release co-solvent based *in situ* gel of mitiglinide calcium: A novel liquid formulation for better control of type 2 diabetes mellitus: *in vitro* and *in vivo* evaluation**Dina Bahaa El Din Mahmoud, Marwa Hassan Shukr and Aliaa Nabil ElMeshad**
Cairo University, Egypt

40 to 50% of type 2 diabetic patients are inappropriately managed and they fail to achieve long-term glycemic control as the requirement of frequent dosing of drugs decreases patients' compliance consequently unsatisfactory adherence to their prescribed treatment regimens. Gastroretentive ion-crosslinking based *in situ* gel is a novel strategy to deliver drugs in sustained release liquid formulations, but they are insuitable for low-water solubility drugs. Thus our goal was to assess the viability of using co-solvency approach in formulating gastroretentive *in situ* gel of the novel short half-life mitiglinide calcium (MTG) to be capable of enhancing its bioavailability and sustaining its release. Here, MTG-*in situ* gel formulations were developed using propylene glycol as co-solvent to dissolve MTG in polymers' solution. 24 factorial design was utilized to investigate the effect of sodium alginate, gellan gum, propylene glycol and calcium carbonate concentrations. The optimized formulation (composed of 1% gellan gum, 0.75% sodium alginate, 0.75% calcium carbonate and 7.5% propylene glycol) showed reasonable viscosity of sol (57.7 cps), once introduced into simulated gastric fluid it formed firm gel (viscosity=1870 cps, gel strength=248.4 g) that floated within 80 sec over its surface and remained buoyant delivering MTG in sustained release pattern over 24 h. The formula signified sustained release manner of MTG over 24 h *in vivo* with marked improvement in the rate and extent of its absorption. Hence co-solvency presents a promising approach to deliver hydrophobic drugs in sustained release liquid formulations and to improve diabetic patients' compliance by eliminating the necessity of frequent dosing.

Biography

Dina Bahaa El Din Mahmoud has completed her Master Degree in pharmaceutics, from Faculty of Pharmacy, Cairo University, Egypt. She is currently pursuing her PhD in pharmaceutics, Faculty of Pharmacy, Cairo University. She works as a senior quality control specialist and a researcher in pharmaceutics laboratory in national organization for drug control and research (NODCAR), Egypt. She has one publication in international journal of pharmaceutics.

dina_bahaa2007@yahoo.com

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