

Synthesis and Evaluation of Antidiabetic Properties of a Zinc-Mixed Ligand Complex in HFD - Low Dose Streptozotocin Induced Diabetic Rats

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ABSTRACT

Due to the multifactorial and multisystemic nature of type 2 diabetes, it is often treated with a combination of therapeutic agents with different mode of action. Zinc is an essential trace element with antidiabetic properties. Earlier, we have synthesized several organo-zinc complexes and evaluated their safety and antidiabetic properties in experimental diabetes. More recently, we have synthesized a Schiff base complex having metformin and 3-hydroxyflavone in the equimolar ratio and evaluated its antidiabetic properties in experimental type 2 diabetes (20mg/kg.b.w./rat/day for 30 days). In the present study, a new zinc-mixed ligand (metformin-3-hydroxyflavone) was synthesized and its antidiabetic properties was evaluated in HFD fed - low dose STZ induced type 2 diabetes in rats. The complex synthesized was subjected to spectral studies namely FT-IR, Mass, ¹H NMR and ¹³C NMR for authentication. The acute toxicity and dosage fixation studies were conducted as per OECD guidelines. The hypoglycemic efficacy of the synthesized complex was evaluated through OGTT, HOMA-IR, QUICK-I and by determining the status of important biochemical parameters. The spectral data evidenced the synthesis of new zinc mixed ligand complex. The oral administration of the complex significantly improved the glucose homeostasis. The complex possesses significant antidiabetic properties relatively at a less concentration (10mg/kg.b.w./rat/day) than the other complexes reported by us. Further, the results of the present study also signify the addition of an organo ligand to metformin significantly improved the efficacy of metformin in ameliorating both the primary and the secondary complications of type 2 diabetes mellitus.