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## *In vivo* evaluation of thiazolidinedione derivatives as euglycemic agents

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**Introduction:** Diabetes Mellitus (DM) is a chronic metabolic disease which can be treated either by decreasing blood glucose by the improvement in insulin secretion or by decreasing insulin resistance in peripheral tissues which is a characteristic effect of Thiazolidinediones (TZDs). TZDs are complete agonists of the Peroxisome Proliferator-Activated (PPAR) γ receptor, which are able to promote the transcription of genes involved in the metabolism of lipids and carbohydrates, but these drugs present undesirable effects such as increase in body weight, hepatic toxicity, plasma volume expansion and heart failure. The aim of this study was to elucidate whether our previously designed compounds, known as C#40, C#81 and C#4, may serve as euglycemic and antioxidant agents.

**Material & Methodology:** Healthy male Wistar rats were randomly divided into 6 groups, each containing 7 animals as-Control, DM, DM+Pioglitazone, DM+C#40, DM+C#81 and DM+C#4. DM was induced by a single intra-peritoneal injection of streptozotocin (45 mg/kg). After the injection, each animal was weighted and monitored for blood glucose levels weekly. At the end of the study, blood and hepatic tissue samples were collected in order to determine glucose, insulin, triglycerides, total cholesterol, antioxidant enzymatic activity, antioxidant non-enzymatic activity and liver enzymes.

**Results:** The treatment with C#40 was able to produce euglycemia better than Pioglitazone, while C#81 was able to reduce glycemia by 300 mg/dl, even though it did not produce euglycemia. The three derivatives increased the values of total cholesterol, while triglyceride levels decreased. C#4 exhibited a better antioxidant activity rather than C#40, C#81 and Pioglitazone, by increasing SOD, CAT, GSH levels by diminishing TBARS levels.

**Conclusion:** C#40 was effective for the decrease of blood glucose and triglycerides. It was found that C#4 is an effective antioxidant compound, rather than C#40, C#81 and Pioglitazone.

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