

ABSTRACT

The Anti-Diabetic Properties of Neem (*Azadirachta indica*) Leaf Extract on
Streptozotocin-Induced Diabetic Rats

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The objectives of this study were (1) to induce type 2 diabetes mellitus in Sprague-Dawley rats (*Rattus norvegicus*) and (2) to evaluate the effect of Neem leaf extract (NLE) on blood glucose and insulin in these rats. For this, two to three-day old rat pups were injected intraperitoneally with 60 mg/ kg body weight (b.w.) STZ to induce diabetes. Type 2 diabetes was confirmed by oral feeding of 15 mg/ kg b.w. glibenclamide. The diabetic test (DT) rats received 0.8% aqueous NLE while diabetic control (DC) and normal control (NC) rats received water *ad libitum*. Body weight, water and chow consumption, and blood glucose were evaluated weekly. The animals were sacrificed at the end of the study. Blood and pancreas were collected to evaluate serum insulin and islet histology respectively. The significance of differences between mean values was evaluated by One-Way ANOVA and Bonferroni post hoc tests. A 'p' value < 0.05 was considered statistically significant.

Streptozotocin induced diabetes in 81.8% of neonatal rats by destroying β -cells ($p \leq 0.0001$ vs NC). The mortality rate was 50%. Chow and fluid consumption increased in the diabetic rats. NLE improved weight gain, β -cell regeneration, and demonstrated non-significant reduction in blood glucose. Serum insulin level

increased in the diabetic rats ($p < 0.05$ DC vs NC) but the extent to which it increased was reduced by NLE.

This study demonstrated significantly lower rate of mortality in STZ treated pups, however, conflicting percentages of rats becoming diabetic warrant further improvement in the technique. The NLE demonstrated the potential to reduce blood glucose.

Keywords: Streptozotocin; Neem; β -cell histology; pancreas; Sprague-Dawley rats; diabetes mellitus; Garsha Alicia McCalla.