The Ameliorative Effect of the Extracts of Vernonia Calvoana Against Streptozotocin Induced Nephrotoxicity in Rats

Abstract

This study aims at evaluating the ameliorative effect of Oleic and Phytol rich extracts of Vernonia calvoana (VC) against Streptozotocin induced nephrotoxicity in rats. Thirty-six (36) albino Wistar of mixed sexes rats weighing (100-150g), were divided into 6 groups of 6 animals each. Groups 1 and 2 representing normal and diabetic controls (NC and DC) respectively, received placebo, while groups 3-6 represented diabetic treated, received 500 mg/kg b. w metformin, 400 mg/kg b. w crude extract, 400 mg/kg b. w n-hexane (Phytol rich) and 400 mg/kg b. w methanol (Oleic rich) extract of V. C, respectively. Drug and extract administration lasted for 28 days. After administration of an extract of VC rich in Oleic and Phytol to diabetic rats for 21 days, the urea and creatinine concentrations showed a significant (p7. 8 mmol/l or > 180 mg/dl were enrolled for the study (Ebong et al. , 2008). Experimental protocolAnimals were grouped as shown in Table 1 above and also accordingly treated with extracts of V. C and metformin. The dosages of the plant extracts and metformin were as earlier reported (Iwara et al. , 2017). The plant extracts and Glucophage were administered via oral gastric intubation, twice per day (10. 00 am: 4. 00 pm). Treatment lasted for 21 days and throughout this period animals were maintained on pallets prepared with Growers feed on Vital Feeds, Jos, Plateau state, Nigeria, and tap water. Both the feed and water were provided ad libitum.

Collection of samples for analysis

After 21 days experimental period, food was withdrawn from the rats and were fasted overnight with access to water. The animals were then anesthetized with chloroform vapor and sacrificed. Whole blood was collected via cardiac puncture using sterile syringes and needles, and emptied into EDTA bottle, allowed for 2 h stored in a refrigerator at 4 oC. The refrigerated blood sample was then centrifuged at 3000 rpm for 10 min to recover the plasma from cells. Plasma was separated with sterile syringes and needle and stored frozen until used for biochemical analysis. Kidney tissue was removed and blotted with Whatman No 1 filter paper to clean the excess blood on the organs, and then weighed using weighing balance. Thereafter a portion of the tissue was sliced and suspended in 10% fixative (formal saline) for histological analysis. Biochemical analysesSerum electrolytes profile viz potassium (K+), chloride (CL-), sodium (Na+), bicarbonate (HCO3), urea and creatinine were estimated colorimetrically using assay kit method from AGAPPE diagnostic (Switzerland) according to manufactured instruction.

Histopathology

The histological examination of the liver tissue of the induced models and the control was carried out using differential staining procedure described by Drury and Wallington, 1967.

Statistical analysis

The results were analyzed for statistical significance by one way Anova (Analysis of variance) with a post hoc Dunnet at (p