

Assessment of toxicity and antitrypanosomal activity of toad venom in rat models

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Abstract

African trypanosomiasis affects millions of humans and animals alike globally. It is considered one of the neglected diseases leading the death of thousands of people. Although, there are a number of commercially available anti-trypanosomal drugs used in treating the disease, but the case of drug resistance, high cost, scarcity coupled with associated side effects warrant urgent alternative. In this study, acute toxicity, prophylactic and suppressive anti-trypanosomal activities of toad venom in rats were determined with standard methods to produce alternative drug. In acute toxicity test, a total of nine (9) Wistar rats were distributed into three groups and administered 10, 100 and 1000 mg/kg body weight (bw.) of the venom, respectively. Doses of 5, 10 and 20 mg/kg bw. of the venom and 5 mg/kg bw. of chloroquine phosphate were administered to the rats in their respective groups, 2 mL of normal saline was also administered to the naïve control and negative control groups in the prophylactic and suppressive anti-trypanosomal activities of the venom. The LD₅₀ of the venom was 30 mg/kg bw. No significant difference ($p > 0.05$) was observed between the percentage trypanosomes suppression in prophylactic and suppressive anti-trypanosomal activities of chloroquine (99.12 and 97.25) % and activities of the venom at 5 mg/kg bw. (98.23 and 96.70) %, and 10 mg/kg bw. (98.23 and 96.70) % respectively. The venom at dose of 20 mg/kg bw. caused significant reduction in Packed Cell Volume while doses of 5 and 10 mg/kg bw. as well as 5 mg/kg bw. of chloroquine phosphate caused significant increment of the PCV. Significant increase ($p < 0.05$) in the levels of ALT, AST, ALP, creatinine, urea and uric acid was observed at dose of 20 mg/kg bw. of the venom, while doses of 5 and 10 mg/kg body weight showed no significant difference ($p > 0.05$) to the naïve control group. It is shown from this study that toad venom exhibits suppressive and prophylactic anti-trypanosomal activities at all tested doses. Therefore, it can be explored further for the production of drugs that can be used for the management and/or treatment of trypanosomiasis. Although, more toxicity test will be required along with the exploration of the venom during the drug development so as to ensure its safety in both human and animals.

Keywords: Toad venom, Acute toxicity, Prophylactic, Suppressive, Anti-trypanosomal activities.