

ABSTRACT

THE USE OF TWO VANADIUM(V) COMPOUNDS AS BLOOD GLUCOSE LOWERING AGENTS AND THEIR EFFECTS ON OTHER PARAMETERS.

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Vanadium compounds have been shown to lower diabetic hyperglycemia in rats with STZ-induced diabetes. This study was done to ascertain whether two synthetic vanadium compounds $NH_4[VO_2(dipic-Cl).H_2O]$ (V5dipic-Cl) and *Sodium[2-{{[2-hydroxy-5-{{[2-hydroxy-1,1-bis(hydroxymethyl)ethyl]imino}methyl}phenyl]diazanyl}}]benzenesulfonateoxovanadate(V).Tetrahydrate* $Na[VO(Tris3).4H_2O]$ (V4) showed blood glucose lowering effects which would be relevant in the treatment of diabetes mellitus. Group A and Group B diabetic animals were developed with Group A being more severely diabetic. A dose dependent study was carried out to determine the most effective dose for each group. The best dosages from the dose dependency studies were 1.18×10^{-3} to 2.76×10^{-3} mmol for V5dipic-Cl complex and 7.12×10^{-4} to 1.66×10^{-3} mmol for the V4 complex. This was then used in the three weeks continuous feeding experiments on 12 different groups of rats to investigate blood glucose concentration, blood pressure, urine analysis, body weight, food intake and water intake. The 12 groups were:

Normal untreated

Group A untreated

Group B untreated

Normal treated with V5dipic-Cl

Group A treated with V5dipic-Cl

Group B treated with V5dipic-Cl

Normal treated with V4

Group A treated with V4

Group B treated with V4

Normal treated with Vanadyl sulfate (VO_2SO_4)

Group A treated with VO_2SO_4

Group B treated with VO_2SO_4

From the continuous feeding experiments, it was found that VO_2SO_4 the positive control and V5dipic-Cl lowered the blood glucose concentration in the Group A treated animals while V4 lowered the blood glucose in the Group B treated animals. The different complexes had no significant effect on blood pressure. It was observed that the Group A and Group B diabetic rats given a food ration of 90 g/day ate their entire food ration compared with the normal rats that ate about Two thirds. Similarly, Group A and Group B diabetic rats drank three times the Amount of water (450 mL) compared with normal rats (150 mL). For the urine analysis, the Group A and Group B diabetic rats were found to have glucose present in the urine with urine glucose levels reduced by V5dipic-Cl.