SUB CHRONIC TOXICITY STUDIES OF DABO HERBAL TONIC(DHT)

BY

SALIHU T AND AKINBOSOLA JP

NIGERIA NATURAL MEDICINE DEVELOPMENT AGENCY(FMST),9, KOFO ABAYOMI STREET, VICTORIA ISLAND LAGOS

Introduction

- Herbal remedies are considered safer and less toxic to the human body than synthetic drugs(Alam *et al*., 2011).

- However, lack of standardization has been a major concern regarding use of herbal medicines (Angell and Kassierr 1998; NIEHS, 1998).

Introduction cont.

- Although herbal supplements are considered safe, some are known to be toxic at high doses while others may have potential side effects after prolonged use(Hazel et al,1999).

- The safety of herbal medicine has recently been questioned due to reports of illness and fatalities (Stewart et al., 1999; Ernst, 2002; Veiga-Junior et al., 2005; Park et al., 2010).

Introduction cont.

- Toxic effects of herbal medicines ranges from allergic reaction, to cardiovascular, hepatic, renal, neurologic, and dermatologic effects (Amitava, 2003).

- There has been reports of hepatotoxicity (Saad et al., 2006) and nephrotoxicity (Cosyns, 2003; Colson and De Broe, 2005; Debelle et al., 2008) from herbal remedies.

Dabo Herbal Tonic (DHT)

- DHT is a polyherbal preparation formulated for the management of rheumatism, anemia, menstrual disorder, loss of appetite, tiredness, general debility, pile and fever.

Objective

- The aim of the present study was to evaluate the safety of DHT through sub- chronic toxicity studies in rats

Materials and Method

Test material

- Dabo herbal tonic (DHT)

Test animals

- Healthy Swiss albino mice(28±2g) of either sex were used for the acute toxicity studies.
- Male albino rats (140 ± 2g) were used for sub chronic toxicity profiling.
- Animals were supplied by Animal Facility Centre of NNMDA,Lagos.

Acute toxicity method

- The Acute toxicity (LD_{50}) was estimated Per os in mice(n=36) using Lorkes ‘D’ method(1983).

- Dose levels ranged from (100-5000).The number of deaths in each group within 72h was recorded.

Sub chronic toxicity studies

- Twenty rats were selected at random and then divided into four groups of five each.

- The drugs were administered daily using a curved, ball-tipped stainless steel feeding needle for a period of 6 weeks.

Sub chronic toxicity cont.

- Control received 0.2ml saline water, while the remaining three groups were given 600, 1200 and 1,800mg/kg per os of DHT for 6 weeks.

- Body weights of the animals were evaluated weekly ,while food , water intake, clinical signs and mortality were monitored daily

Sub chronic toxicity studies cont.

- At the end of the experiment, after 24 hrs of the last dose and 18 hrs fasting, animals were sacrificed and blood was collected intracardially .

- The blood was taken into heparinized tube for hematological studies and non-heparinized centrifuge tube for biochemical estimations.

Sub cronic toxicity studies cont

Biochemical parameters

- The method used by Sushrata et al,2006 was used to analyse Serum alanine aminotransferases (ALT), alkaline phosphotase (ALP) and creatinine .

- The method used by Wasan et al,2001 was used to determine High density lipoprotein while Friedwald method (Crook 2006) was used to determine Low density lipoprotein .

Sub chronic toxicity cont.

Haematology

- The white blood cells (WBC),Parked cell volume were determine by the method described by Dacie and Lewis (1991).

- The haemoglobin (Hb) concentration was determined by the Cyameth-haemoglobin method.

Sub chronic study cont.

Statistical analyses

- The results are expressed as mean ±standard error of the mean (SEM). One-way analysis of variance (ANOVA) was employed for between and within group comparison.

- 95 % level of significance($p \leq 0.05$) was used for the statistical analysis.

Results

Acute toxicity

- The LD_{50} was above 5000mg/kg

Fig 1: Effect of oral DHT extracts on body weight of rats after 6 Wks of treatment

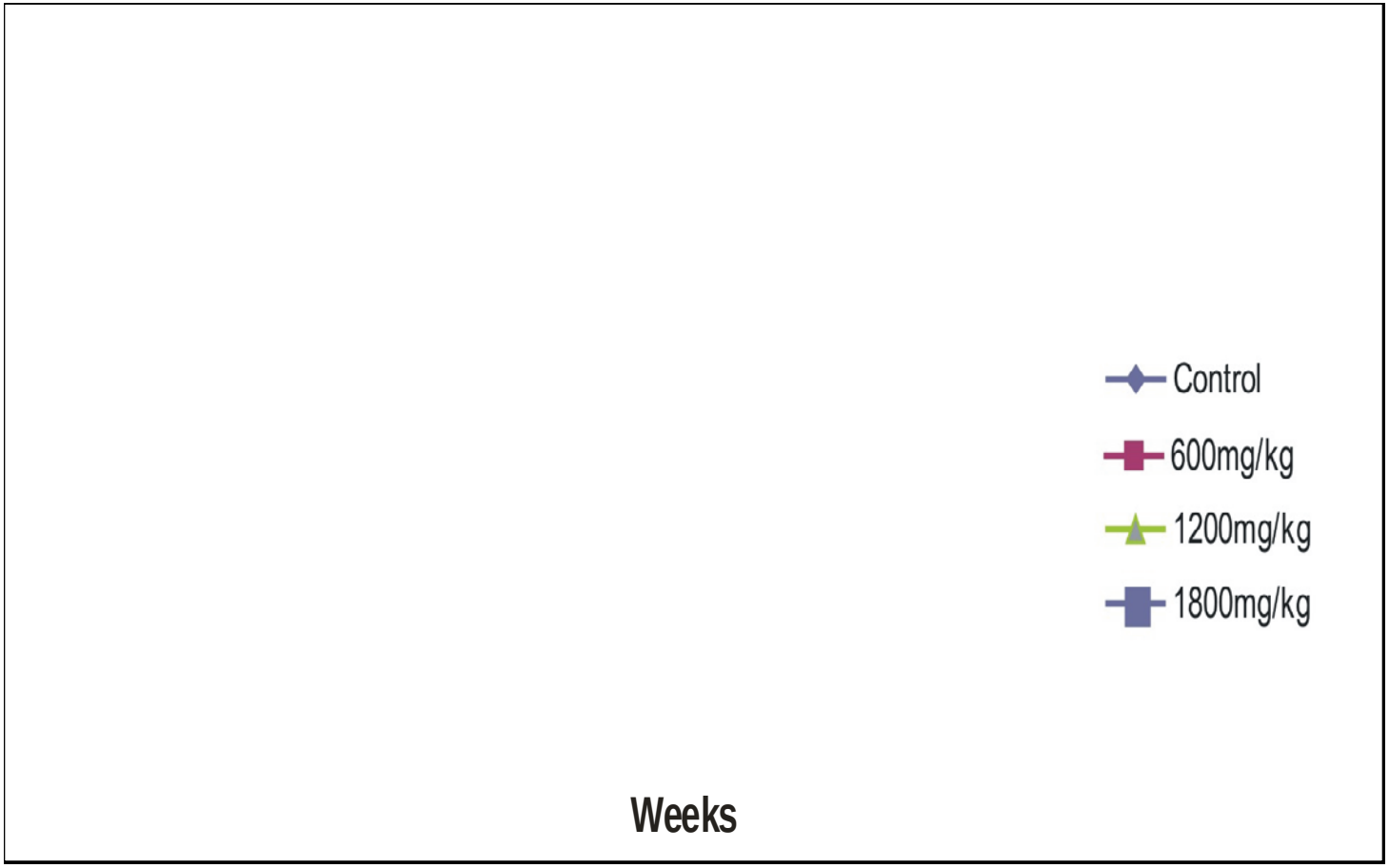


Fig 2: Effect of oral DHT extracts treatment on body organs of rats after 6 wks

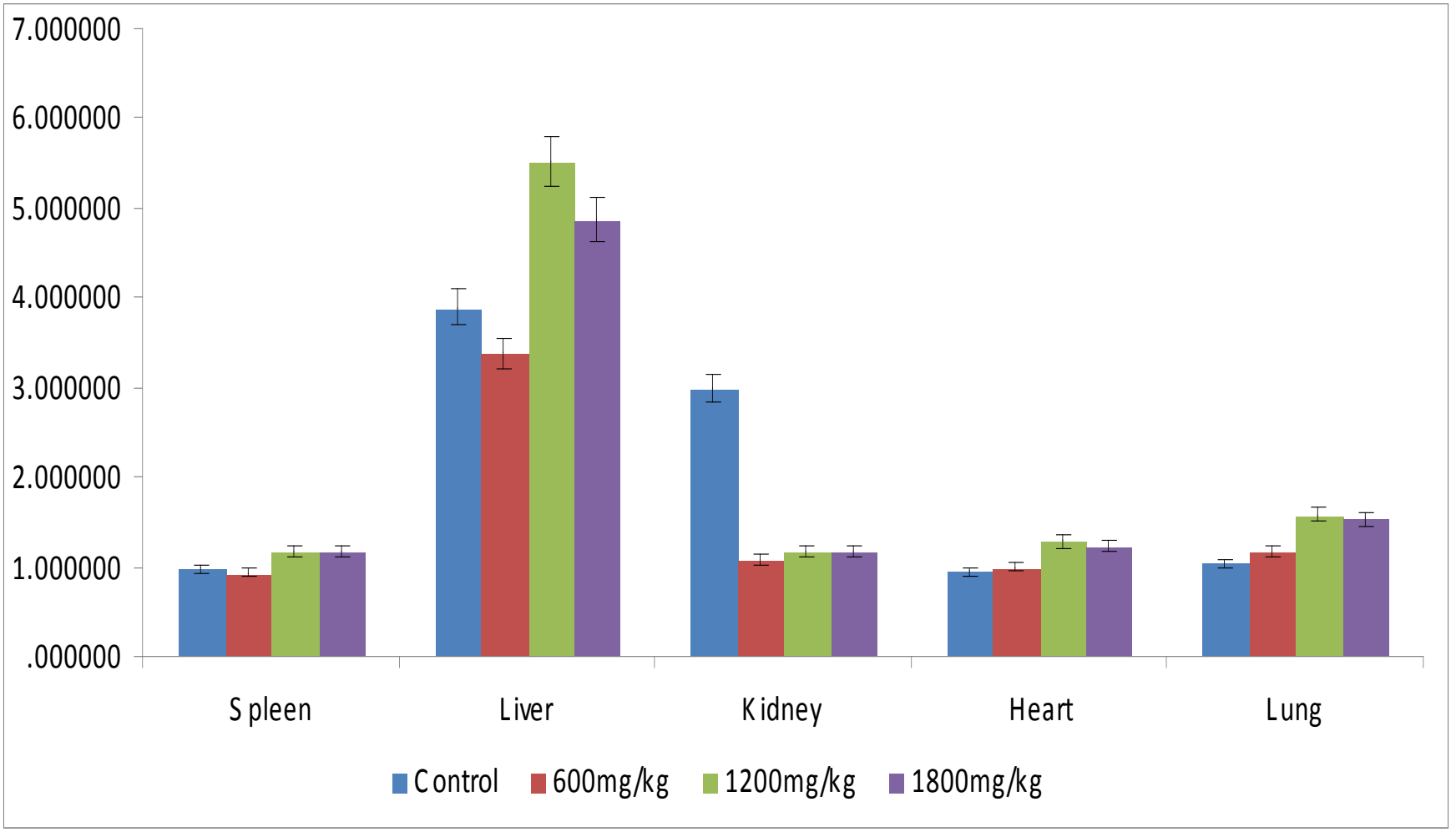


Fig 3:Haematological parameters after 6 wks oral treatment with DHT extract

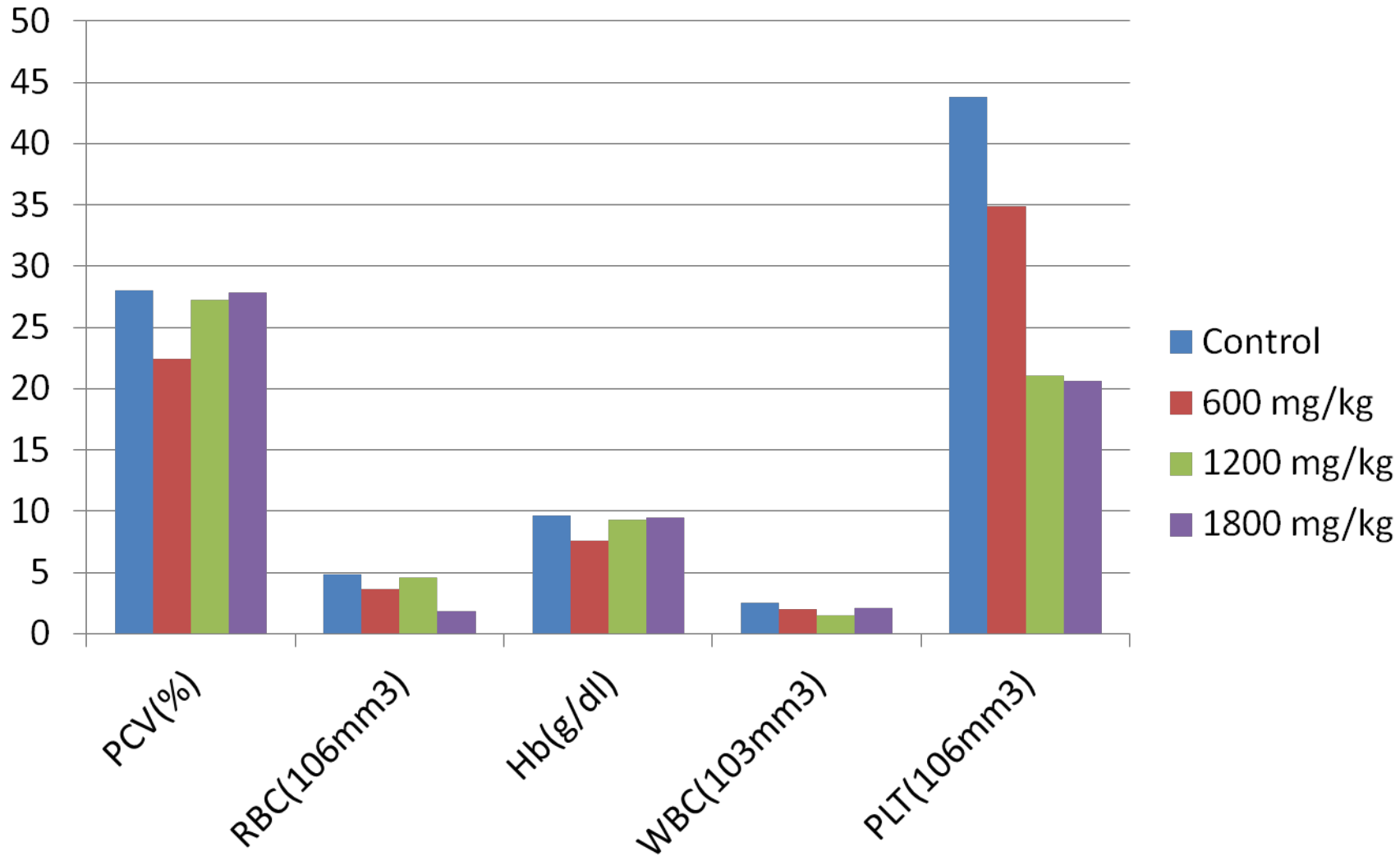


Fig 4: Effect of oral DHT treatment on serum biochemical parameters of rats after 6 wks

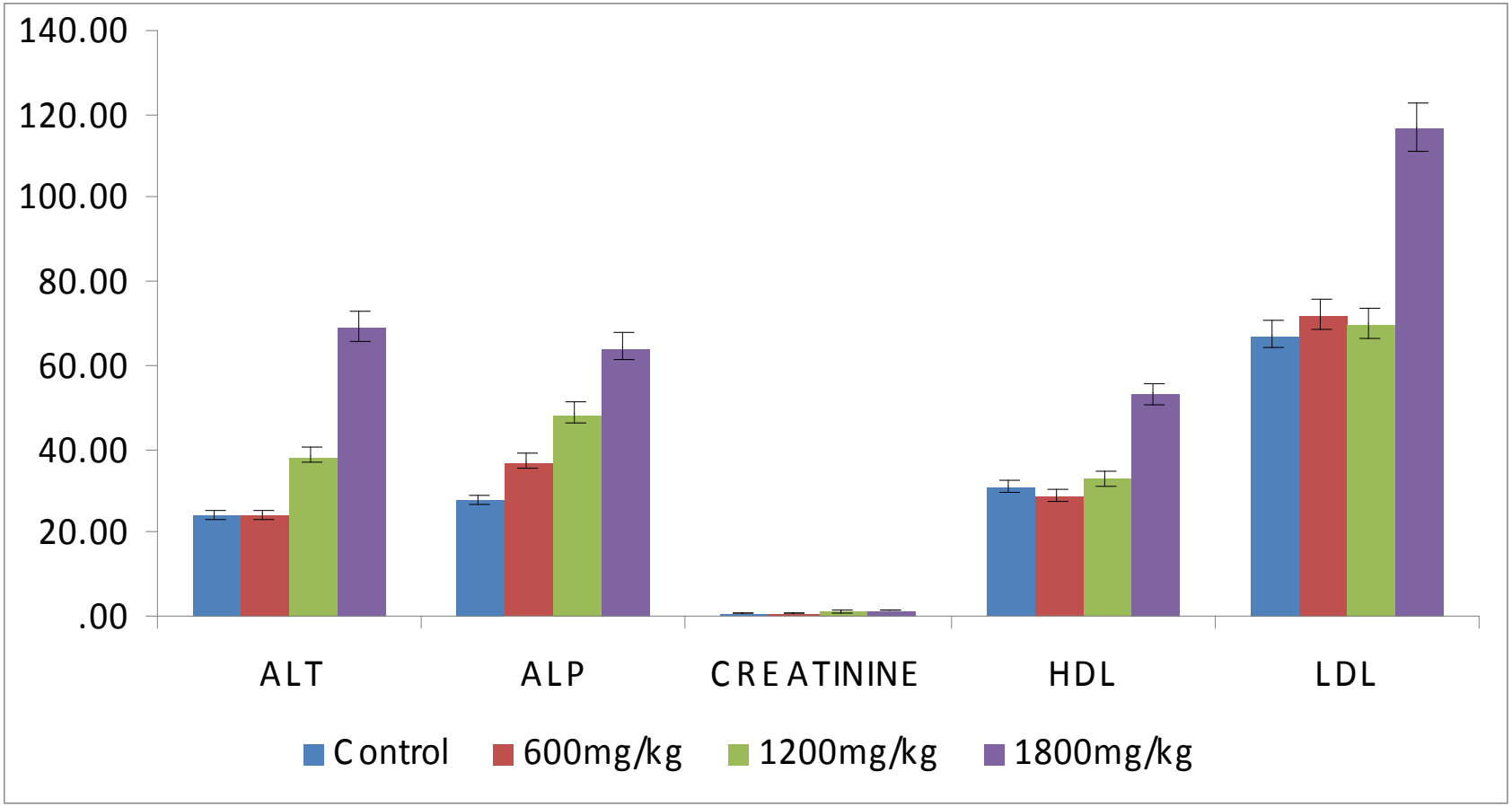
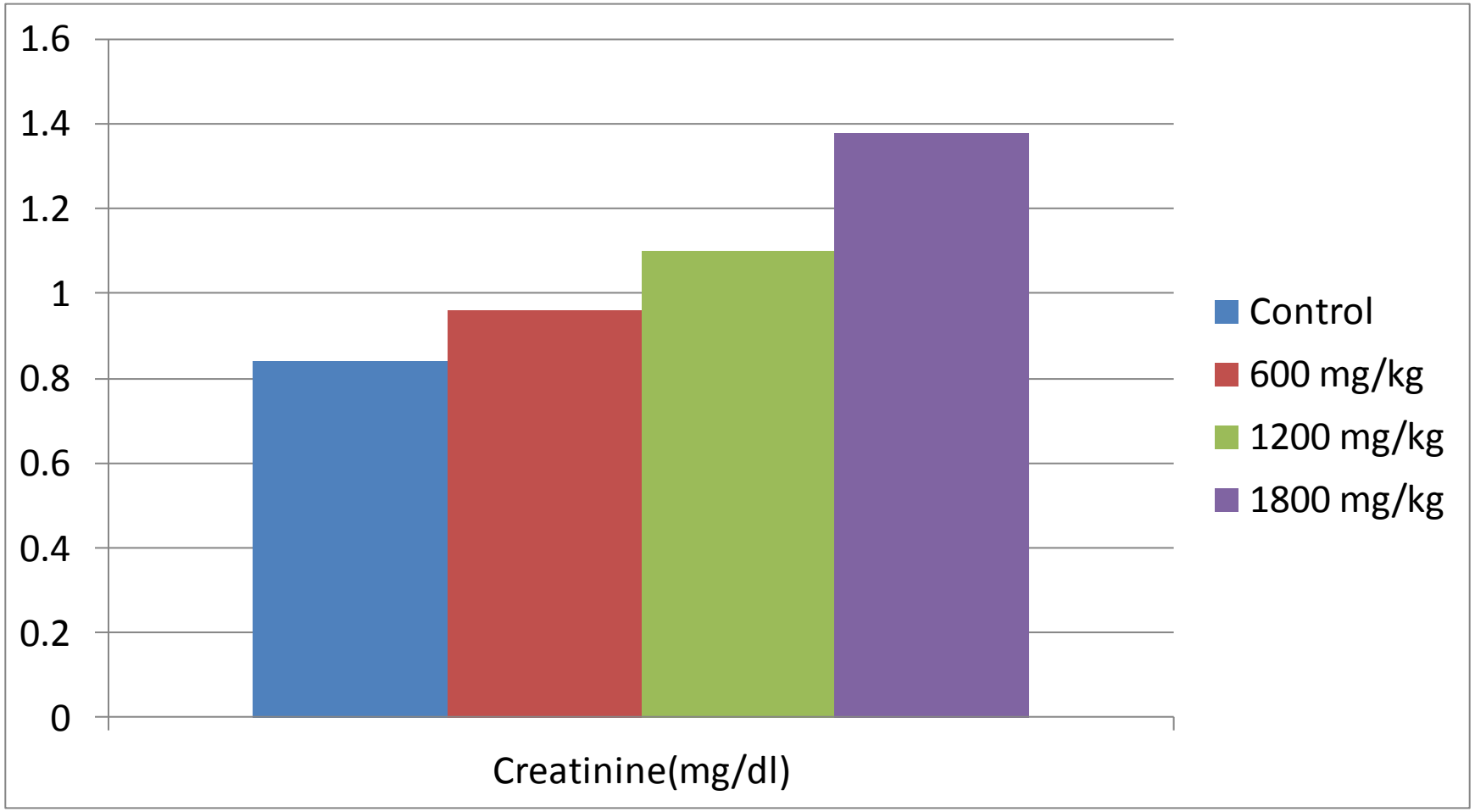


Fig 5: Effect of oral DHT on serum creatinine levels in rats after 6 weeks of treatment



Discussion

- LD_{50} was above 5000mg/kg
- Any compound or drug with oral LD_{50} greater than 1000mg/kg is of low toxicity and safe(Clarke and Clarke,1967)

- There was comparable increase in body weight of rats in DHT treated and control groups.This mean product does not inhibit growth(Okokon et al,2010).

Discussion cont.

- Reduction in body and internal organ weights are considered sensitive indices of toxicity after exposure to toxic substance (Raza et al, 2002 and Teo et al, 2002).

- The significant decrease in kidney weights in all the DHT treated doses is an indication of nephrotoxicity.

Discussion cont.

- The significant decrease in red blood cell counts (RBC) at 1800mg//kg with no effect on other blood parameters contradicts it's usage as a haematinic.
- The significant decrease in platelets counts could prolonged bleeding time .
- Increase in the enzymatic activity of ALT, AST and ALP in the serum directly reflects a major permeability or cell rupture (Benjamin, 1978).

Discussion cont.

- ALT is a hepatospecific enzyme (Benjamin 1978; Ringer and Dabich 1979) and is a specific marker for hepatic injury.
- The increase in the level of ALT therefore indicates hepatic injury (biochemical or pathological).

Discussion cont.

- Elevation in the plasma creatinine concentration indirectly suggests kidney damage, specifically by renal filtration mechanism (Wasan et al., 2001).
- Elevation of plasma creatinine at higher doses of DHT(1200mg/kg and 1800mg/kg) with the significant decrease in weights of kidneys implies that the extract could cause kidney damage and subsequent renal fairlure(Wasan et al.,2001;Crook,2006) .

Conclusion

- The claim that natural plant products are safe should only be accepted after plant products have undergo toxicological screening (Jaykaran et al,2009).

Thank you for listening

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