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Original Research Paper

HAEMATOLOGICAL EFFECTS OF 1% ALUM TO NEWZEALAND RABBITS

Amna Beshir Medani^{1*}, Samia Mohammed Ali El Badwi² and Ahmed El Amin Mohammed²

¹Department of Pharmacology and Toxicology, University of Medical Sciences & Technology, Faculty of Pharmacy, Khartoum, 12810 Sudan

²Department of Medicine, Pharmacology and Toxicology, University of Khartoum, Faculty of Veterinary Sciences, Khartoum, Sudan

ABSTRACT

Newzealand rabbits were purchased from Balsam pharmaceutical factory, weighed and divided into groups. Group 1 animals were the undosed controls. Test groups were given alum at dose rates of 1% for a period of 10 weeks after an adaptation period of two weeks during which the animals were under ideal experimental conditions. Clinical signs, postmortem and histopathological examinations were closely observed together with hematological changes in Hb, PCV, RBCs and WBCs. On alum challenge, Newzealand showed inappetance, nervous signs and were finally recumbent. The mortality rate was 100%. On atomic absorption only the lungs kept residual alum, while the livers washed-out the substance, may be via bile. Notably oral dosing with alum caused congested liver with white spots, stiff-greenish lungs and inflamed empty intestines. The un-dosed group 1 goats showed a normal picture. On histopathology, alum-dosed goats showed necrosis in the cortex and medulla of the kidney in one group member, emphysema in the lungs and necrosis in the hepatocytes and congestion in the liver. Practical implications of the results were highlighted and suggestions for future work were put forward.

Keywords: 1% Alum solution, Drinking water, Newzealand rabbits, Toxicity.

INTRODUCTION

This research work carried out on the Haematological effects of 1% alum to newzealand rabbits and Clinical signs, postmortem and histopathological examinations were closely observed together with hematological changes in Hb, PCV, RBCs and WBCs.

MATERIALS AND METHODS

Animals

Nine 5-7 month old mixed Newzealand rabbits were purchased from Balsam Pharmaceutical Laboratories, Khartoum North and housed in cages (4m² for each dose-group) within the premises of the Department of Parasitology, Faculty of Veterinary Medicine, University of Khartoum. Animals were clinically healthy and

were given prophylactic doses of oxytetracycline 5% (Bremerpharma, Germany) and sulphamethazine 33.3% (Norbrook, UK) against bacterial infections and coccidiosis respectively. The animals were ear-tagged and allowed a 2-week preliminary period during which time lucerne and drinking Nile water were provided *ad libitum*.

Administration of the Doses

Stock materials were prepared of 1% solution of AlSO₄ and given orally to 3 rabbits as their daily demand of Nile water after weighing at the end of the adaptation period.

Parameters

Clinical signs and mortality rates were recorded. Blood samples were obtained from the ear vein

before the start of the experimental dosing and there after fortnightly for haematological investigations and serum analysis. Haemoglobin concentration (Hb), Packed Cell Volume (PCV), Red Blood Cell (RBC) and White Blood Cell (WBC) counts were estimated (Schalm, 1965).

Statistical Methods

The difference between mean values of data were analyzed by the un-paired students- t-test (Snedecor and Cochran, 1967).

RESULTS

Clinical Signs

Newzealand rabbits dosed with 1% alum showed inappetence, nervous signs and were finally recumbent and the mortality rate was 100 percent. The uncontrolled diarrhea and salivation, dullness, shivering, inappetence and finally

Hematological Values

1 Group /Dose	Hb (g%)	PCV %	RBCs (x10 ⁶)	WBCs (x10 ³)
G un-dosed	10.92±0.83	35.54±4.33	3.79±0.29	3.86±0.29
G (1% solution)	7.93±6.92 ^{NS}	29.60±1.83 [*]	7.40±2.96 ^{**}	11.77±3.99 ^{**}

NS=Not significant * denotes P<0.05 ** denotes P<0.01

These rabbits showed serum intensities of Hb that were similar (P>0.05) to the levels obtained from the control group. These rabbits also highlighted significant (P<0.05-0.01) decreases of PCV, RBCs and WBCs values compared to those of the untreated control rabbits. Control hematological values were normal.

The Out-Come of Intoxication of Newzealand Rabbits with Alum

The under tested animals highlighted that a daily routine dosing of 1% alum revealed marked nervous system involvement including showed inappetence, nervous signs and were finally recumbent and the mortality rate was 100 percent. The uncontrolled diarrhea and salivation, dullness, shivering, inappetence and finally recumbence were the most obvious sings, the whole picture of which is pointing to parasympathetic involvement whereas the low voice was indicating the local irritant effect of alum on the vocal folds. In addition to the high rate of mortality in animals the necrotic intoxicated endothelium of the heart proved on

recumbence were the most obvious sings. No abnormal clinical signs were observed in the undosed control goat kids.

Post-Mortem Findings

Empty intestines were the most prominent feature observed in the 1% alum -dosed rabbits; also stiffness of lungs was pronounced, in addition, presence of white foci in the intestines and livers. Whereas the undosed group showed a normal picture.

Histopathological Picture

Test rabbits were showing a picture of obvious edema and emphysema in the lungs, intestines suffered catarrhal inflammation and clear generalized necrosis and lymphocyte infiltration in the livers. The control undosed group 1 rabbits showed a normal picture.

atomic absorption by the high pulmonary levels of aluminum, marked pulmonary affections probably contributed to the development of dyspnea (Tarnowski, 2007) which was also approved on atomic absorption of the processed liver in which alum values were negligible. The anaemia and depletion were mainly indicated by the decrease in PCV, RBCs (Maitra *et al.*, 2007) and WBCs.

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Correspondence Author:

Amna Beshir Medani

Department of Pharmacology and Toxicology, University of Medical Sciences & Technology, Faculty of Pharmacy, Khartoum-12810, Sudan



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