

## EFFECT OF DIAZINON ON SOME BLOOD PARAMETERS IN MALE RABBITS

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### SUMMARY

This study was designed to investigate the acute toxic effect of Diazinon on some blood parameters. Twelve male rabbits were divided randomly and equally into two groups, A treated group (T) and control group (C). Animals of group (T) were dipped in 3:1000 diazinon solution. Within 24 hours following the treatment, animals of group (T) showed moderate symptom of organophosphorous poisoning such as dyspnea and depression. Blood analysis of the group (T) animals revealed a significant elevation of blood sugar and urea. These changes were correlated with increased W.B.C. counts.

The results of this study indicate that dipping with diazinon is not free of side effects on certain physiological functions of body systems.

### INTRODUCTION

Diazinon (0,0- diethyl 0-12- is opropyl 1- methyl -6 pyrimidinyl) phosphorothionate, and other organophosphorous compounds are indirect cholinesterase inhibitors (1). This inhibitory activity leads to elongation of the period of the effect Ach in the tissus.

There fore it causes a recognizable signs such as increased in salivary secretions gastrointestinal motility (3). Calves exposed to superphosphate poisoning showed clinical signs such as marked increased respiratory movements, evidence of dehydration, heart murmurs and abdominal discomfort (1).

The onset of symptoms after exposure to organophosphorous compound is usually rapid within few minutes to 2- 3hr. and the duration of these symptoms lasts for 2-5 days (2). Diazinon is widely used in Iraq in Vet, practice. It is used as insecticid for eradication of external parasites by either spraying or dipping. However the side effects of these practices on body functions has not been extensively studied in Iraq. The present experiment was designed to study some physiological and biochemical changes in male rabbits exposed to diazinon by dipping.

### MATERIALS AND METHODS

Twelve mature male rabbits local breed and weighing between 1.75 to 2.00 kg. Were randomly divided into two equal groups a treated group (T), in which the animals were dipped for 10 sec. in 3/1000 diazinon dipping solution (Diazinon-60 ED-Veterinary and Agricultural products Manufacturing, Co. L.T.D. Amman-Jordan) at 37-40°C and a control group (C), the animals of which were dipped in tap water at the same temperature and period. Animals of both groups were exposed to similar experimental conditions (feeding, housing). Fasting blood samples from animals of both groups were collected from the marginal ear vein before and 24 hr. following treatment. The blood samples were handled as 2 fractions; the first fraction was transferred into tubes containing E D T A (anticoagulant) for studying blood picture & determination of blood sugar. Serum samples were isolated from the second fraction and stored at 20 °C for further biochemical analysis.

Haematological investigation included: Red Blood cells (R.B.C.) & White blood cells (W.B.Cs.) counts (cells/C.mm) & measurement of packed cells volume (P.C.V.) (ratio) applying routine methods (9). Haemoglobin (g/dl) (Hb) was estimated using cyanomethemoglobin method (5). The biochemical parameters were measured according to methods described by (11): fasting blood

sugar (mg/dl), urea (mg/dl) & total proteins (g/dl). The data were statistically analyzed using student t-test (10).

## RESULTS

Animals belong to group (T) showed typical symptoms of cholinesterase inhibition such as: depression, respiratory discomfort and muscle tremor. No symptoms were observed on control animals.

Animals treated with diazinon showed a significant increase in blood sugar & blood urea ( $P < 0.05$ ), while level of total proteins were not altered (Table 1).

The results of haematological parameters are presented on Table (2). Total leucocytes count was significantly increased in treated animals ( $P < 0.05$ ). On the other hand the erythroid system (R.B.C. count, Hb & P.C.V.) did not show significant changes under the influence of diazinon.

## DISCUSSION

Result of this study indicates that animals exposed to relatively low dose of diazinon had suffered from some effects of drug. This was manifested by changes in the physiology of the body systems represented by clinical signs like depression & dyspnea by the indirect cholinesterase inhibitory effect of diazinon (1).

The increase in blood glucose (Table. 1) can be explained by one or more of the following factors: 1. An increased rate of glycogenolysis which may be produced by hormonal disturbances related to carbohydrate metabolisms (12), an increased release of one or more of hyperglycemic hormones result in hyperglycemia reported in this study. 2. The increased glucose level; could be due to an increased rate of gluconeogenesis (8) which probably induced by diazinon exposure. 3. Hyperglycemia comes as a result of decreased glucose utilization. A disturbance in pancreatic functions leading to decrease insulin release may lead to hyperglycemia (12).

Nevertheless, further investigation is needed to explain the sources and causes of diazinon induced hyperglycemia.

The uremia observed in the treated animals can be attributed to either kidney damage produced by diazinon (4) resulting in a decreased renal filtration and/or increase renal reabsorption of urea. Or it may result from an increased protein catabolism, however, the findings of this study do not support that, since protein levels did not change significantly (Table. 1).

The haematological changes were confined to the leucocyte system only. The leucocytemia observed in this investigation can be accounted for a stimulating effect diazinon the rate of synthesis and release of the leucocyte specific stimulating factors leading to increased number of circulating total leucocytes (6.7).

In conclusion, results of this experiment indicate that dipping with diazinon is not free of harmful side effect on certain body organs.

**Table 1 : Effect of diazinon on blood biochemical parameters in male rabbits.**

Animal groups	Blood sugar mg/100 ml.	Blood Urea mg/100 ml.	Total serum proteins g/100 ml.
Control	130 ± 8.17	27.75 ± 3.83	6.3 ± 0.34
Treatment	195* ± 20.83	34.0* ± 4.70	6.66 ± 0.34

**Table 2 : Effect of diazinon on heamatological parameters in male rabbits.**

Animal groups	W.B.C. cell/mm <sup>3</sup>	R.B.C. cell/mm <sup>3</sup>	P.V.C. Ratio	H.B. gm/100 ml
Control	3775 ± 354	5326750 ± 441	37.7 ± 1.90	12.62±2.97
Treatment	9350* ± 1775	5877538 ± 352	38.5 ± 1.46	12.40±0.64

\* Means significant difference between control and treatment groups at level of 0.05.

#### REFERENCES

- 1- Abdelsalm E.D.; Ford E.G.H. (1986); Effect of pretreatment with hepatic microsomal enzyme inducers on the toxicity diazinon in calves. Research in Vet. Sci. Vol.41 pp.336-339.
- 2- Christopher Brom; W. Burnham Gross; and Marion Ehrich. (1986); Effect of social stress on the toxicity of malathion in Young chickens. Avian disease. Vol. 30 No.1, pp.679.
- 3- Curtis D. Klaassen, Mary O.Amdur (1986). Casarett and doulls toxicology. New York.
- 4- Dickson J.; Mullins K.R. (1987): Suspected supper phosphate poisoning in calves. Aust. Vet. J. Vol. 61, No.12, pp387.
- 5- Embert H. Coles (1971): Vet. Clinical path W.B.Saunders cop.
- 6- Ganong, W.F. (1989): Reviwe of meducal physiology. 14th ed. Appleton and Lang. Los Altos, California.
- 7- Guyton, C.A (1986) Text book of medical physiology, 7th edition. Sandres comp.
- 8- Joan F. Zilva & P.R. Rannail (1981); Clinical chemistry in diagnosis and treatment. 4th edition.
- 9- Schalm, O.W. (1965): Vet. Haematology, 2nd edition. pp 661.
- 10- Steel, R.G. and Torri, J.H. (1960): Principles and proceduress of statistics.
- 11- Tietz, W.N. (1976): Fundamentals of clinical chemistry 2nd edition.
- 12- Tietz, W.N. (1986): Text book of clinical chemistry.

## تأثير عقار الدايزينون على بعض متغيرات الدم في ذكور الارنب

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### الخلاصة

صممت هذه الدراسة لمعرفة التأثيرات الجانبية لعقار الدايزينون على بعض المؤشرات الدموية دلالة على التغيرات الحاصلة في بعض وظائف الجسم المختلفة . استخدم (12) من ذكور الارنب البالغة ، قسمت عشوائيا وبالتساوي إلى مجموعتي السيطرة والمعاملة والتي تم تغطيسها بمحلول الدايزينون المخفف 1000/3 ، خلال 24 ساعة من معاملة الحيوانات بالعقار لوحظ عليها اعراض مرضية تمثلت في صعوبة التنفس والخمول . اظهرت تحاليل الدم زيادة ملحوظة في مستويات سكر وبولينا الدم رافقت هذه التغيرات زيادة ملحوظة في عدد كريات الدم البيضاء الكلي . تشير نتائج الدراسة الحالية إلى ان تغطيس الحيوانات بهذا العقار لا يخلو من التأثيرات الجانبية على بعض وظائف الاعضاء