

## **SOME HEMATOLOGICAL AND BIO CHEMICAL EVALUATION OF SHEEP REARED IN AREAS EXPOSED TO DEPLETED URANIUM**

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### **ABSTRACT**

A study was conducted during the autumn of 2000 with sheep fed on pasture from areas very near to the military operations yards in which bombs containing depleted uranium were used during 1991 war. These areas were:Safwan, Zubair, North Rumaila, tanks grave yards and Sanam Mountain. 18 samples were collected from sheep grazed in these areas. Two methods were used to measure the Radioactive nucleosides in the blood; Lyoluminescence and Track detectors methods, so that blood samples were divided into radiated and non radiated. Results of the hematological evaluation showed no significant difference between radiated and non radiated samples in Hb, PCY, and RBC. Insignificant increase was noticed in total and differential leukocytes of radiated blood samples-The biochemical parameters were also insignificantly changed in radiated blood samples as compared with those obtained from non radiated animals. These includes; total protein, cholesterol .Blood serum enzymes showed significant decreased in Aspartate aminotrasferase (AST) , while no such changes were observed in, Alaninaminotransferase (ALT), and Alkaline Phosphates (ALP) .

### **INTRODUCTION**

The propensity of radiation and radioactive nuclides to effect health has been acknowledged long before the inception of nuclear weapon. Radiation was the first teratogenic agent observed to effect man and animals.' It has been well established that therapeutic doses of radiation during organogenesis provoke blood, mal formation, and even death (10) The alteration of the function and properties of organisms can be detected after exposure to relatively low doses of radiation (3).

### **MATERIALS AND METHODS**

During the autumn of the year 2000, blood samples were collected from sheep "grazing on pasture in southern desert .This area was bombed with bomb contained depleted uranium, during the 1991 war. Blood was collected from the jugular vein using heparin zed vacationer tubes, and the concentration and activity of radionuceli in blood samples were measured by means of tow methods: Track detector and Lyaluminescence , so that, the blood samples were divided into the radiated and non radiated .(7).

The hematological and biochemical evaluation of both samples were done. These include: Red blood count (RBC), White blood count (WBC) Differential leukocytes count (DLC) , Packed cell volume(PCV) ., Hemoglobin (Hb) content, according to:(13). Transaminases Enzymes: glutamic oxaloacctic (AST), and glutamic pyruvic (ALT), were measured according to (9)

.Alkaline phosphates (ALP), according to King and Armstrong method (13). Sodium and Potassium, according to (13). The obtained data were analyzed statistically using analysis of variance (ANOVA ), and the statistical differences between means were done by T test. The computation was facilitated by statistical package SPSS.

### RESULTS

The results on' hematological studies Hb content, PCV, and RBC are arranged in Table 1. non significant differences in these parameters were observed between the radiated and non radiated blood samples .

In spite of the insignificant differences between the studied groups ,some extra white blood cells noticed , table(2)the main increase were in esinophil and basophile ,but this did not reach the significant levels

**Table (1)Blood parameter of radiated and non radiated sheep (mean ± stander error )**

Treatments	IVESTIGATION		
	Hb gm/100 ml	PCV (%)	RBC x 10 mm <sup>3</sup>
Non radiated	8.96 ± 1.4	27.78± 3.40	1201.43 ± 240.54
Radiated	8.40 ± 1.26	26.20 ± 3.79	1244.29 ± 324.95
LSD <sub>1</sub>	NS	NS	NS

NS = non significant .

**Table(2)Total and differential leukocytes in radiated and non radiated sheep (Mean ±Stander error)**

Treatment s	Investigation					
	WBC/mm <sup>3</sup>	Neutrophil(%)	Esinophil(%)	Basophil(%)	Lymphocyte(%)	Monocyte(%)
non radiated	5592.86±2821070	55.14±2.93	0.57±0.21	0.49±0.19	26.71±1.96	17.14±0.96
radiated	6400.00±1153.43	56.71±3.88	0.86±0.32	0.86±0.36	23.71±2.11	17.57±2.15

LSD	NS	NS	NS	NS	NS	NS
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NS=non significant

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the biochemical investigation on blood serum (Table 3) revealed that ,cholesterol content

Treatments	Biochemical parameters		Blood serum ions	
	Cholesterol mg/100ml	Total protein gm/100ml	Na mmol/l	K mmol/l
non radiated	236.52±3.32	5.60±0.64	71.20±7.25	6.80±0.92
radiated	163.59±4.70	5.82±0.50	60.80±12.27	5.00±0.01
LSD	NS	NS	NS	NS

decreased insignificantly in radiated group ,whereas, total protein slightly increased sodium the biochemical investigations on blood serum table(3)revealed that ,cholesterol content and potassium. concentration were not statistically significant between two groups.

**Table (3) biochemical parameter and blood serum ions of radiated and non radiated sheep (mean ± stander error)**

ns=non significant

The serum enzyme activities of AST,ALT and ALP are shown in table (4).AST was significantly decreased (p 0.05) in radiated group ,while other enzymes (ALT and ALP ) showed insignificant decreased in their activities .

**Table (4) Blood serum enzymes of radiated and non radiated sheep(mean ± stander error)**

Treatments	Blood serum enzymes		
	AST iu/l	ALT iu/l	ALP kau/100ml
non radiated	28.20± 9.02	11.60±2.99	13.00±5.80
radiated	5.20±0.49	5.20±0.37	6.00±0.45
LSD	S	NS	NS

S=significant

## DISCUSSION

It seems from the obtained results that ,after ten years of using the depleted uranium during the 1991 war in southern of Iraq ,animals still suffering from the effect of the nuclear weapons .Avery little concentrations of radioactive materials were detected in the blood of animals grazing in these areas (7),these amounts ranged between 0.1 to 1.9 pci/l according to tracks detector and 0.31 to 3.1 pci/l according to lyoluminescne .however, the homeostatic processes which are responsible for the adaptive responses ,triggered by exposure to low doses of radiation (4),these may give reason to the insignificant results in the studied hematological parameter .moreover, in the present study the Hb ,PCV ,RBC, WBC, DLC ,the concentration of trace elements and enzymes obtained in sera of the radiated and non radiated groups were comparable to values reported in Arabi sheep (12 ,11) .It seems that ,the passage of long period of time and many generations of the sheep reared in the

some physiological parameters in domestic rabbits *lepus cuniculua* areas may reduced the effect of radiation (10). antioxidants ;which are present in grazed grasses may be quite effective in scavenging free radicals produced by the passage of radiation through the body cells before they interact with and damage critical macromolecules like DNA (2 ,1).however, the decrease in AST values in the present study in radiated group is in agreement with previous report of (8). This may be attributed to the formation of H<sub>2</sub>O<sub>2</sub> from radiation which inhibits the enzymes activity taking in considerations that AST enzyme is more sensitive than other enzymes in this respect (6)..

### تقييم بعض الصفات الدموية والكيموحيوية لمصل دم الاغنام المرلبة في الأراضي الملوثة باليورانيوم المخضب

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#### الخلاصة

أجريت الدراسة خلال خريف عام 2000 على غنم ترعى في أراض تعرضت لقصف بقنابل محملة باليورانيوم المخضب خلال حرب 1991 شملت الدراسة مناطق سفوان والزابير والرميثة الشمالي ومقبرة الدبابات وجبل سنام. جمعت ثمانية عشر عينة دم من هذه الحيوانات من وريدها الوداجي واستخدمت طريقتان لقياس المواد المشعة هما: التآلق الاذابي وكاشف الأثر وبناء على ذلك قسمت عينات الدراسة إلى عينات دم مشعة وغير مشعة .  
بينت نتائج تقييم الصفات الدموية، عدم وجود فارق معنوي بين المجموعتين المشعة وغير المشعة في قيم خضاب الدم وحجم الخلايا المضغوط وعدد كريات الدم الحمر وحدثت زيادة غير معنوية في العدد الكلي والتفريقي لكريات الدم البيض في المجموعة المشعة. أما الصفات الكيمائية لمصل الدم لهذه الحيوانات، فقد أظهرت أيضا تغيرات غير معنوية في قيم البروتين الكلي والكولسترول وفي الوقت الذي اظهر فيه أنزيم مصل الدم AST انخفاضا معنويا لم يظهر الإنزيمان ALT .ALP لأي تغير في قيمتهما .

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