

# Study comparison for haematological and biochemical changes in Ducks infected with *Amidostomum anseris* .

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## Abstract

The study was conducted to determine of haematological and biochemical changes in ducks infected with nematoda worm *Amidostomum anseris* and compared with control group , 52 samples of ducks were collected at Village subsequent of Al-Diwaniya city as well as city center .

Birds divided in to four groups : G<sub>1</sub> represent control group , G<sub>2</sub> birds with light infection , G<sub>3</sub> birds with mediate infection , G<sub>4</sub> birds with severe infection .

Haematological parameters include count total red blood corpuscles (Erythrocytic ) and white blood corpuscles (Leucocytic), packed cell volume%(P.C.V) and Haemoglobin concentration (Hb), biochemical parameters include measurement of total protein(T.P) concentration , total Cholestrol concentration(T.C) and Triglyceride(T.G) .

The results of blood examination showed that total erthrocytic count , Packed cell volume and haemoglobin (Hb) percentage decreased significant in infected groups , The total leucocytic count showed significant increased in all infected groups. also result showed that total protein concentration decreased significant in G<sub>2</sub>,G<sub>3</sub>,G<sub>4</sub> as compared with G<sub>1</sub>. while total cholestrol and triglycerides decreased gradual in serum blood of all infection birds .

## دراسة مقارنة للتغيرات الدموية والكيموحيوية في البط المصاب بالديدان الاسطوانية *Amidostomum anseris*

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### الخلاصة

أستهدفت الدراسة الحالية تحديد التغيرات الدموية والكيموحيوية في البط المصاب بالديدان الاسطوانية *Amidostomum anseris* ومقارنتها بمجموعة السيطرة ، أذ تم إجراء هذه الدراسة على ٥٢ طير من البط جمعت من بعض القرى التابعة لمدينة الديوانية بالإضافة الى مركز المدينة .

قسمت الطيور الى أربعة مجاميع G<sub>1</sub> تمثل مجموعة السيطرة و G<sub>2</sub> تمثل الطيور ذات الاصابة الضعيفة و G<sub>3</sub> تمثل الطيور ذات الاصابة المتوسطة و G<sub>4</sub> تمثل الطيور ذات الاصابة الشديدة .

شملت المعايير الدموية حساب العدد الكلي لكريات الدم الحمر Erthrocytic count والعدد الكلي لكريات الدم البيض Leucocytic count والنسبة المئوية لحجم الخلايا الدموية المرصوفة Packed cell volume وقياس تركيز الهيموكلوبين Haemaglobin ، أما المعايير الكيموحيوية فشملت قياس تركيز البروتين الكلي(T.P) وتركيز الكولسترول الكلي (T.C) والكليسيريدات الثلاثية (T.G).

أظهرت نتائج فحوصات الدم حصول فقر دم أي انخفاض تركيز الهيموكلوبين مع انخفاض العدد الكلي لكريات الدم الحمر وانخفاض النسبة المئوية لجم الخلايا الدموية المرصوفة وزيادة عدد كريات الدم البيض في الطيور المصابة بالدودة *Amidostomum anseris* مقارنة بمجموعة السيطرة .

كما أشارت النتائج الى وجود انخفاض معنوي في معدل تركيز البروتين الكلي في  $G_2, G_3, G_4$  مقارنة بـ  $G_1$ ، أما فيما يتعلق بمستوى الكولسترول والكليسيريدات الثلاثية فقد لوحظ انخفاض تدريجي في معدل تركيز الكولسترول الكلي والكليسيريدات الثلاثية في مصل دم جميع الطيور المصابة .

## Introduction

poultry farming plays a very important role in the struggle against poverty by producing a cheap source of protein, and local poultry represents the majority of animals raised by farming populations for their own consumption, sale, and cultural and social uses(1) .

Different types of poultry infected with many from intestinal helminthes that effect in production such as meat and eggs as well as its effect in functions operation and some toxins and chemical materials that causes block function body (2).

In addition to sucking blood of the host, the greatest damage is done when the young worms migrate in to the wall of the proventriculus, causing marke dirritation and inflammation, which may kill bird (3). Infected birds are emaciated and anemic in heavy infestation. There is diarrhea and death in heavily infected (4).

Disease from intestinal parasites results when normal body function are impaired and the degree of impairment determines severity of the disease , in some instance , there is no apparent disease but there is a loss in production such as food conversion or gain , severity of disease can depend on the type of parasite or the number of parasites involved (5).

Finally Infestation by parasites, mainly helminths, is very high and probably responsible for a high proportion of keet deaths. Indeed, several surveys have indicated a high prevalence of parasites in different African countries: 85 to 89% in Burkina Faso (6) 40 to 92% in Niger (7) and 87 to 97% in Benin (8) .

In Iraq there is no data about effect *Amidostomum anseis* in haematological and biochemical paramrters in ducks and this is first one .

The aim of the study is contain determine haematological and biochemical changes in ducks that causes by *Amidostomum anseris*

## **Materials and Methods**

Fifty two adult ducks were collected from some village subsequent of Al-Diwaniya city as well as city centre .

The visceral separated from mesentery were divided in to five parts crop , gizzard , small intestinal , large intestinal and caecum then put in container then worms isolation kept in tube contain physiological saline , this worm stained with lactophenol (9 ) and examined under lower and higher magnification( 10x,40x) . Identification of *Amidostomum anseris* was carried out using the characters described by Calenk *etal.* (10 ) .

### **Haematological parameters:**

Blood was collected from the individual birds of each group from vein at region under wing. Sterile vials with 20 mL of 10% EDTA were used as anticoagulant for collection of blood. Two milliliters of anti-coagulated blood was collected from each bird and was kept in refrigerator for haematological studies. R.B.C. and W.B.C. were done by Neubauer haemocytometer. The Rees and Ecker solution was used as diluting fluid as described by Sastry (11). Hb concentration was estimated by cyanmethemoglobin method as described by Dacial(12). P.C.V was determined by Wintrobe haematocrit method as described by Schalm *et al.* (13).

### **Biochemical parameters:**

Blood was collected from the individual birds of each group from vein at region under wing. Two milliliters of blood was collected from each bird in sterile test tubes without anticoagulant and allowed to clot. Serum was separated by centrifuge and kept at 20°C until analysis. Total protein was estimated by Biuret and Dumas method as described by Dumas *et al.* (14) by using SPAN diagnostic kit (Code No. 23935). Cholesterol concentration was estimated by colour method as described by Richmond (15) , measurement of triglycerides were depended on method Allaint *et al.*,(16) .

### **Statistical analysis:**

The results were analysed by Analysis variance and used test Least significant differences (LSD) under probability level  $P < 0.05$ .

## **Results**

## 1- Haematological parameters:

Table (1) shows different haematological changes in ducks infected with *Amidostomum anseris*, it is clear from table (1) that a significant decrease in erythrocytes in all infected groups as compared to the control group (non-infected), and shows a significant decrease in haemoglobin values, packed cell values in all infected groups with *Amidostomum anseris*, while a significant increase in leucocytic values in all infected groups as compared with the control group of ducks, also seen in table (1)

Table 1: Haematological changes in ducks infected with *Amidostomun anseris*

Groups of birds examination	R.B.C. $\times 10^6/\text{mm}^3$	W.B.C. $\times 10^3/\text{mm}^3$	Hb gm/100 ml	P.C.V. (%)
G <sub>1</sub>	5.973 $\pm$ 0.040	24.077 $\pm$ 0.136	11.876 $\pm$ 0.080	38.997 $\pm$ 4.669
G <sub>2</sub>	4.874 $\pm$ 0.033	29.015 $\pm$ 0.542	9.442 $\pm$ 0.281	30.159 $\pm$ 0.369
G <sub>3</sub>	4.127 $\pm$ 0.153	31.192 $\pm$ 0.596	8.177 $\pm$ 0.0845	28.092 $\pm$ 0.291
G <sub>4</sub>	3.573 $\pm$ 0.168	32.027 $\pm$ 0.050	6.917 $\pm$ 0.046	24.937 $\pm$ 0.278

Values of R.B.C, W.B.C, Hb, P.C.V. are presented as mean  $\pm$  standard deviation. All results show significant difference from other values at  $P < 0.05$

## 2- Biochemical parameters :

The results of table (2) showed a significant decrease of total protein in G<sub>2</sub>, G<sub>3</sub> and G<sub>4</sub> of infected birds with *Amidostomum anseris*, total cholesterol and triglyceride show a decrease gradually in infected groups of ducks with nematode worm (*Amidostomum anseris*).

Table 2: Biochemical changes in ducks infected with *Amidostomum anseris*

Groups of birds examination	Total protein gm/100 ml	Total cholesterol mg/100 ml	Triglycerides mg/100ml
G <sub>1</sub>	6.026 $\pm$ 0.088	134.4 $\pm$ 4.926	73.8 $\pm$ 3.910
G <sub>2</sub>	4.419 $\pm$ 0.376	113.3 $\pm$ 5.912	64.65 $\pm$ 5.142
G <sub>3</sub>	4.015 $\pm$ 0.029	102.5 $\pm$ 2.175	55.928 $\pm$ 4.445
G <sub>4</sub>	3.08 $\pm$ 0.193	95.875 $\pm$ 3.270	48.75 $\pm$ 1.832

Values of T.P., T.C. and T.G. are presented as mean  $\pm$  standard deviation. All results show significant difference from other values at  $P < 0.05$

## Discussion

During the study an attempt was made to find nematoda worm (*Amidostomum anseris*) infesting native ducks in village subsequent of Al-Diwaniya city as well as city center and also to determine haematological and biochemical changes caused by this *Amidostomum anseris*.

Haematological study showed that total erythrocyte count decreased significantly in infected groups of ducks ( $G_2, G_3, G_4$ ) than that of control group ( $G_1$ ). This agrees with (17, 18, 19).

Lowered total erythrocytic count in *Amidostomum anseris* infected ducks might be due to lowered erythropoiesis, and it is usually associated with mild-acute enteritis which hampers the absorption of essential nutrients for blood cell formation. In the present study the total leukocytic count was shown to have a significant increase in ( $G_2, G_3, G_4$ ) as compared with control group, this is in agreement with finding (18) in quails and chicken and agreement with (19) in poultry.

The net increase in the total leukocytic count might be due to the increase in heterophils and eosinophils because they reform the first defence line against body infection (19). The haemoglobin percentage showed a significant decrease in all infected groups than that of the control group. (18) also recorded a similar observation in his experiment. The lowered Hb values might be due to metabolic disturbance caused by worms rather than direct blood loss (20). Also, results show that a significant decrease in packed cell volume in ( $G_2, G_3, G_4$ ) as compared with control group ( $G_1$ ). (18) recorded the same finding in his experiment in quails and chicken infected with *Ascaridia galli*, also (21) in fowls infected with *Ascaridia galli* (22) in ducks.

Biochemical study showed that total serum protein decreased significantly in all infected groups with *Amidostomum anseris* as compared with control groups. This finding was in agreement with finding of (18, 19), the lowered T.P. values may be due to a great loss of tissue protein which may occur through leakage into the gut with loss of digestive secretion and mucus due to intestinal parasitism in anaemic birds, which also caused inefficient protein absorption (18). Total cholesterol and triglyceride values show a significant ( $P < 0.05$ ) decrease in all infected groups with *Amidostomum anseris* than the control group, the lowered T.C and T.G values might be due to the effect of worms on lipid absorption.

## References

- 1- Boko, C.K; Kpodekon, M.T.; Farougou, S.; Dahouda, M.T; Youssao, A.K.I . Aplogan , G.L; Zanou , G and Maini, G.J .( 2011). Farmer perceptions and pathological constraints in helmeted guinea fowl farming in the Borgou department in North-East Benin. *African Journal of Agricultural Research.*, 6(10), pp. 2348-2357
- 2- Mhasien, F. T. (1983) . Disease and parasites of fishes . Basrah University Press., pp 227.
- 3- Soulsby, E.J.L.( 1982). Helminths arthropods and Protozoa of domesticated animals, 7<sup>th</sup> end. Bailliere Tindall, London.
- 4- Saif, Y.M.; Faldy, A.M; Calnek, B.W; Beard, C.W; Swayne, D.E; Barnes, H.J.; McDougald , L.R.& Glissin, J.R.( 2003). Diseases of poultry 11<sup>th</sup> ed. Iow State Press, 937-939.
- 5- Donna, K.C.(2007). Internal Parasites. P 6. ([www.Edsorg](http://www.Edsorg)) .
- 6- Bessin, R.; Belem, A.M.G.; Boussini, H.; Compaore, Z.; Kaboret , Y.& Dembele M. A. (1998). Causes of young guinea fowl mortality in Burkina Faso *Revue Elev. Méd. Vét. Pays Trop.*, 51(1): 87-93.
- 7- Idi, A. (1998). Peasant practices in traditional poultry farming in Niger. Résultats de recherche. International Network for Family Poultry Development (INFPD), Newsletter, 8(3): 2-4.
- 8- Salifou, S.; Goudegnon, M.; Pangui, J.L. & Toguebaye, B.S. (2003). Helminthical parasitic fauna of digestive tract and trachea of Guinea fowl (*Numida meleagris galeata*) in North-East of Benin. *Rev. Afr. Sant. Prod. Anim.*, 1: 25-29.
- 9- Tylor, E.R. & Muller, R. (1971). Isolation and Maintenance of parasites in vivo. *Symp. Birt. Soc. Parasitol. Blackwell Sci. Publ. Oxford*, Pp: 109-121.
- 10- Calnek, B.W.; Barnes, H. J.; McDougald, L.R.; Beard, C.W. & Saif, Y.W. (1991). Disease of Poultry. Publisher Ames Press, Iowa, USA. P1080.
- 11- Sastry, G.A.( 1983). Veterinary Pathology. 6<sup>th</sup> Edn. CBS Publishers and Distributors. New Delhi-110 032, pp: 727 .
- 12- Dacial, J.V.( 1985). Practical Hematology. 6<sup>th</sup> Edn .
- 13- Schalm, O.W.; Jain, N.C. & Corroll, E.J.(1986). Veterinary Haematology. 4<sup>th</sup> Edn. Lea and Febiger, Philadelphia .
- 14- Dumas, B.T.; Arends, R.L. & Pinto, P.V.C. (1971). Determination of serum albumin using BCG. In: *Standard Methods Clin. Chem.*, 7 : 175-189.
- 15- Richmond, W.(1973). Preparation and properties of cholesterol oxidase from *Nocard sp* . and its application to the enzyme assay of total cholesterol . *Clin Chem* ., 19: 1350-1356 .

- 16-Allain, C.C.; Poon, L.S. & Richmond, W.F.C. (1974). The Merk manual of diagnostic and therapy, Merk Co. Clin. Chem., 20 (4) : 470-475.
- 17-Al-Wadi, H.M.H. (1997). Some ecological aspects of the parasitic faunae of fishes and aquatic birds in bahr Al-Najaf depression, Iraq. Ph.D. Thesis, Coll. Edus (Ibn Al-Haitham) University. Baghdad: 71 pp.
- 18- Deka, K. and Borah, J. (2008). Haematological and Biochemical Changes in Japanese Quails *Coturnix coturnix Japonica* and Chickens Due to *Ascaridia galli* Infection. International Journal of Poultry Science 7 (7): 704-710.
- 19- Tanwar, R.K. and Mishra, S. (2001). Clinico-Haemato-Biochemical studies on intestinal helminthiasis in poultry. Vet. Practitioner, 2: 137-140.
- 20-Kumar, R.; Sinha, S.R.P. Verma, S.B. and Sinha, S. (2003). Haematological changes in the Japanese quails (*Coturnix coturnix japonica*) naturally infected with nematode *Ascaridia galli*. Ind. Vet. Med. J., 27: 297-299.
- 21- Matta, S.C. and Ahluwalia, S.S. (1982). Haematological indices as influenced by *Ascaridia galli* infection in fowl. Effect on the haemoglobin concentration, packed cell volume and erythrocytes sedimentation rate. Ind. J. Poultry Sci., 17: 46-51.
- 22- Nyaile, S.F.; Thekiso, M.M.; Bisschop, S.P. & Mbatil, P.A. (2003). A diagnostic survey of avian parasitic infection from village poultry in Qw-Qwa South Africa. Dep. Zool. Entomo. J. Protozoa Res., 13: 44-50.