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: G₁ represent control group, G₂ birds with light infection, G₃ birds with mediate infection, G₄ 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 G₂,G₃,G₄ as compared with G₁. while total cholestrol and triglycerides decreased gradual in serum blood of all infection birds.

**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 parameters in ducks and this is first one.
The aim of the study is to determine haematological and biochemical changes in ducks caused by *Amidostomum anseris*.

**Materials and Methods**

Fifty-two adult ducks were collected from some villages subsequent of Al-Diwaniya city as well as city center. The visceral separated from mesentry were divided into five parts: crop, gizzard, small intestinal, large intestinal, and caecum. Each part was put in a container, and worms isolation was kept in a tube containing physiological saline. This worm was stained with lactophenol (9x) and examined under lower and higher magnification (10x, 40x). Identification of *Amidostomum anseris* was carried out using the characters described by Calenk et al. (10).

**Haematological parameters:**

Blood was collected from the individual birds of each group from the vein at the region under the wing. Sterile vials with 20 mL of 10% EDTA were used as anticoagulant for collection of blood. Two milliliters of anti-coagulated blood were collected from each bird and were kept in a refrigerator for haematological studies. RBC and WBC were done by Neubauer haemocytometer. The Rees and Ecker solution was used as a 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 the vein at the region under the wing. Two milliliters of blood were 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 a color method as described by Richmond (15), measurement of triglycerides were depended on method Allaint et al., (16).

**Statistical analysis:**

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

**Results:**

Haematological parameters: 1-

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 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 control group of ducks, also seen in Table (1).
### Table 1: Haematological changes in ducks infected with *Amidostomum anseris*

<table>
<thead>
<tr>
<th>Groups of birds examination</th>
<th>R.B.C. $\times 10^6$/mm$^3$</th>
<th>W.B.C. $\times 10^3$/mm$^3$</th>
<th>Hb gm/10 0ml</th>
<th>P.C.V. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>5.973 ± 0.040</td>
<td>24.077± 0.136</td>
<td>11.876± 0.080</td>
<td>38.997 ± 4.669</td>
</tr>
<tr>
<td>G2</td>
<td>4.874 ± 0.033</td>
<td>29.015 ± 0.542</td>
<td>9.442± 0.281</td>
<td>30.159± 0.369</td>
</tr>
<tr>
<td>G3</td>
<td>4.127 ± 0.153</td>
<td>31.192± 0.596</td>
<td>8.177± 0.0845</td>
<td>28.092± 0.291</td>
</tr>
<tr>
<td>G4</td>
<td>3.573 ± 0.168</td>
<td>32.027± 0.050</td>
<td>6.917± 0.046</td>
<td>24.937± 0.278</td>
</tr>
</tbody>
</table>

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

### 2- Biochemical parameters:

The results of Table (2) showed significant decrease of total protein in G2, G3, and G4 of infected birds with *Amidostomum anseris* , total cholesterol and triglyceride shows decrease gradual in infected groups of ducks with nematoda worm(*Amidostomum anseris*).

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

<table>
<thead>
<tr>
<th>Groups of birds examination</th>
<th>Total protein gm/100 ml</th>
<th>Total cholestrol mg/100 ml</th>
<th>Triglycerides mg/100 ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>6.026 ± 0.088</td>
<td>134.4 ± 4.926</td>
<td>73.8 ± 3.910</td>
</tr>
<tr>
<td>G2</td>
<td>4.419 ± 0.376</td>
<td>113.3 ± 5.912</td>
<td>64.6 ± 5.142</td>
</tr>
<tr>
<td>G3</td>
<td>4.015 ± 0.029</td>
<td>102.5 ± 2.175</td>
<td>55.928 ± 4.445</td>
</tr>
<tr>
<td>G4</td>
<td>3.08 ± 0.193</td>
<td>95.875 ± 3.270</td>
<td>48.75 ± 1.832</td>
</tr>
</tbody>
</table>

Values of T.P., T.C. and T.G. are presented as mean ± 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 (G2, G3, G4) than that of control group (G1). This agree with (17, 18, 19). Lowered of total erythrocytic count in *Amidostomum anseris* infected ducks might be due to lowered erythropoesis and its 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 were showed significant increase in \((G_2, G_3, G_4)\) as compared with control group, this is in agreement with finding (18) in quails and chiken and agreement with (19) in poultry.

The net increase in the total leukocytic count might due to the increase in heterophils and eosinophils because they reform first defence line against body infection (19). The haemoglobin percentage showed significant decrease in all infected groups than that control group. (18) also record similar observation in his experiment. the lowered in Hb values might be due to metabolic disturbance caused by worms rather than direct blood loss (20). also results shows that asignificant 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 \textit{Ascardia galli}, also (21) in fowls infected with \textit{Ascardia galli} (22) in duks.

Biochemical study showed that total serum protein decreased significant in all infected groups with \textit{Amidostomum anseris} as compared with control groups. This finding was in agreement with finding of (18,19), the lowered of T.P. values may belonged a great loss of tissue protein may occur through leakage into gut with loss of digestive secretion and mucous due to intestinal parasitism in anaemic birds, which also caused inefficient protein absorption (18).total cholesterol and triglycerides values shows asignificant \((P<0.05)\) decreased in all infected groups with \textit{Amidostomum anseris} that than control group, the lowered of T.C and T.G values might be due to effect of worms in lipids absorption.

References:


دراسة مقارنة للتغيرات الدموية والكيميائية في البط المصابة بالدودة الأسطوانية

Amidostomum anseris

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الخلاصة

أستخدمت الدراسة الحالية تحديد التغيرات الدموية والكيميائية في البط المصابة بالدودة الأسطوانية Amidostomum anseris، ومقارنتها بمجموعة السيطرة، أذ تم أجراء هذه الدراسة على 52 طير من البط جمعت من بعض القرى التابعة لمدينة الدويانية بالإضافة إلى مركز المدينة.

قسمت الطيور إلى أربعة مجموعات G1، G2، G3، G4 تتمثل مجموعات السيطرة وتمثل الطيور ذات الإصابة الشديدة وتمثل الطيور ذات الإصابة المتوسطة وتمثل الطيور ذات الإصابة الخفيفة.

العدد الكلي للكريات الدم البيضاء Erthrocytic count ونسبة الكريات الدم البيضاء Haemoglobin، كما قبض على تحليل عينات من البط لقياس تركيز الليمفويات T.P، (T.G) Haemoglobin، والكليسترول الكلي (T.C)

أظهرت النتائج وجود ارتفاع في خصلات الرئة، كما أن تكونات تركيز الكليسترول كلي، وانخفاض نسبة الكليسترول في الطيور المصابة بالدودة Amidostomum anseris

كما أشارت النتائج إلى وجود انخفاض معنوي في معدل تركيز البروتين الكلي في G2، G3، G4، كما أن هناك انخفاض تدريجي في معدل تركيز الكوليسترول الكلي والكليسترول الثلاثي في البط المصابة. تصلح هذه النتائج لمصلحة جميع الطيور المصابة.