Some haematological changes in sheep with chronic fascioliasis in Mosul

T.M. Al-Saffar
Coll. of Vet. Med./ Univ. of Mosul.

Abstract

The aim of the study was to determine the various haematological changes and one biochemical parameter in sheep with chronic fascioliasis (an abbatoir study and parasitological survey). Chronic fascioliasis is the most common, serious and of economic importance particularly in sheep raising countries. The basic lesions are progressive biliary cirrhosis with hard fibrotic liver, the bile ducts are prominent, thickened and fibrous, in addition to clinical symptoms especially Bottle-jaw. The results of this study have revealed the following findings: a decrease was noticed in the haemogram indices i.e. Hb, PCV, RBC, MCHC, increase values of ESR (Erythrocyte Sedimentation Rate) and MCV and a decrease in total protein values (hypoproteinemia) as compared with control group of animals (normal sheep).

Introduction

Ovine fascioliasis is prevalent in Iraq (8),(11). Veterinary records confirmed that the prevalence of the disease in sheep was 7.9%. Al-Bayyatee reported that the incidence of liver fluke infestation in Mosul was 16.5% (2) and (13). Fascioliasis is a territorial risk of increasing economic importance, since sheep are highly susceptible to the disease (4). An abbatior study with parasitological examination of feces from suspected animals in reported areas where the disease is prevalent in Mosul was carried out. A single infection with Fasciola spp. was only included in this study. Laboratory investigations on blood samples (Haemogram values, Hb, PCV, RBC, MCHC) showed a significant decrease as compared with normal control group of sheep. An increase in ESR values and MCV among infected animals (Chronic fascioliasis) (1) confirmed that the most important biochemical changes of sera from diseased animals showed decrease total serum protein (hypoproteinemia). Therefore, the present study was conducted to show the effects of chronic fascioliasis on Awassi sheep in Mosul (haemogram changes), type of Anemia, ESR changes and one biochemical test.

Materials and Methods

The study was conducted on 60 Awassi sheep of different sexes, 1-5 years old in Mosul from January 2006 to July 2006. Thirty sheep from Mosul Abbatoir definitely infected with liver fluke (Chronic fascioliasis). Twenty sheep (positive fecal examination with fasciola spp ova) from different areas in Mosul (Hawee farm). Ten sheep normal control group of animals (with no any parasitic disease). Blood samples from all animals were collected and one part were kept in EDTA tubs, other blood samples were collected in plane plastic tubes (without anticoagulant for examination). Haematological examinations of the blood was done as follows:

- Hb: by Sahli – method and using specific Kit (Randox laboratories) with Spectrophotometer and total Red Blood Cell Count (Automatic full digital cell counter MS9).
- RBC: by Haemocytometer using Haym’s fluid, Newbaur chamber and Automatic full digital cell counter MS9.
- ESR: by Westergreen method (0.4cc) of sodium citrate 3.8% as anticoagulant and 1.6cc of blood and read the result after 24 hr.
- Total serum protein was done using Biurette Reagent and specific Kit for protein. Depending on MCV and MCHC indices that were used for determination of type of anemia. Statistical analysis of the result depend on One-Way analysis of
The laboratory results of this study which conducted on sheep with chronic liver fluke infestation to determine the effect on haemogram values is seen in Table 1. [Decrease of haemogram values (Hb = 8.2 gram/dl), PCV = 29%, RBC = 5.2x10⁶/cc, MCV = 54.7(fl), MCHC = 28.2 gm/dl)]. As compared with control group of animals and it is significant at P<0.001. The present clinical symptoms of the selected animals were, Bottlejaw, general weakness, diarrhea, shedding of wool, pallor of mucosa. Sixteen animals out of (50) examined showed anemia (32%) of blood loss or haemorrhagic type. This anemia was mild to moderate and combined with nutritional deficiency and number of the flukes in side the liver, season, rain fall, temperature. Significant increase in ESR values was observed mean value of infected animals = 18 mm/24 hr., while normal value of control group was 4mm/24 hr. This test is done for the first time in Mosul, it is an important test for study of physical status of the animal particularly for chronicity and tissue damage caused by Parasitic migration, irritation and fibrosis of the liver and bileducts. No sex differences among infected animals was noticed. (30 samples were collected from males, 20 samples from females). Hypoalbuminemia was predominant in infected sheep (Total serum protein 5.9 gm/dl), also a decrease in serum albumen value (2.6 gm/dl) with increase value of Globulin (3.3 gm/dl) as seen in Table (2). Hypoalbuminemia is not noted usually until 60% of the hepatic function is lost.

Table (1). Hemogram values of examined animals. (60 Blood samples)

<table>
<thead>
<tr>
<th>Animals tested</th>
<th>Chronic fascioliasis</th>
<th>SE</th>
<th>Control group</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Hb gm/dl</td>
<td>8.2</td>
<td>±0.13</td>
<td>11.4</td>
<td>±0.11</td>
</tr>
<tr>
<td>* PCV%</td>
<td>29</td>
<td>±1.15</td>
<td>35</td>
<td>±0.81</td>
</tr>
<tr>
<td>* RBC x 10⁶</td>
<td>5.3</td>
<td>±0.12</td>
<td>6.3</td>
<td>±0.12</td>
</tr>
<tr>
<td>MCV</td>
<td>54.7</td>
<td>±1</td>
<td>55.5</td>
<td>±0.84</td>
</tr>
<tr>
<td>* MCHC</td>
<td>28.2</td>
<td>±1.1</td>
<td>32.5</td>
<td>±74</td>
</tr>
<tr>
<td>***ESR mm/24 hr</td>
<td>18</td>
<td>±0.89</td>
<td>4</td>
<td>±3.6</td>
</tr>
</tbody>
</table>

Values are Means ± SE
* Significant at P<0.001
*** Highly significant at P<0.001

Table (2). Total serum protein values of the examined animals

<table>
<thead>
<tr>
<th>Animals tested</th>
<th>Chronic fascioliasis</th>
<th>SE</th>
<th>Control group</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total serum protein*</td>
<td>5.9</td>
<td>±0.23</td>
<td>7</td>
<td>±0.21</td>
</tr>
<tr>
<td>Albumen*</td>
<td>2.6</td>
<td>±2</td>
<td>4.5</td>
<td>±0.17</td>
</tr>
<tr>
<td>Globulin*</td>
<td>3.3</td>
<td>±0.18</td>
<td>2.5</td>
<td>±0.15</td>
</tr>
</tbody>
</table>

Values are Means ± SE
* Significant at P<0.001

**Discussion**

Quantitative differences were observed in the haematological values (decrease Hb, PCV, RBC, MCHC) of the diseased animals with chronic fascioliasis and these results are in agreement with those reported by other workers (1), (3),
Anemia is haeomorrhagic (Blood loss anemia) associated with abnormal iron metabolism due to chronic invasion, migration of flukes and their larvae inside the liver parenchyma (each fluke causes blood loss of 0.2cc daily) and combined with hepatic insufficiency, malnutrition, also anemia depends on severity of the disease and number of the flukes inside the liver, prevalence of snails in the grazing farm. Increase of ESR values is due to chronic tissue damage caused by migration, irritation, fibrosis and changes in plasma proteins and it is highly significant at P<0.001. No significant differences was seen for MCV value. In animals with sever liver disease (chronic fascioliasis) hypoproteinemia and decrease albumin is attributed to haemorrhage and hepatic insufficiency (poor utilization and retention of nitrogen led to hypoalbumin) and this result is in agreement with those of other workers (1), (6), (9) and (12). Increase value of globulin in the infected animals due to failure of Kupffer cells of the liver and the clearance of protein absorbed from the intestine to the liver via portal circulation and these proteins come in contact with immune system in other part of the body resulting in hyperglobulinemia (1) and (9).

References

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2. البياني، محمد علي (1891). دراسة وافية ونسرية لمرض خلاص الكبد في العراق من منطقة الموصل. رسالة ماجستير/كلية الطب البيطري - جامعة بغداد.
بعض التغييرات الدموية في الأغنام المصابية بحلزون الكبد المزمن في منطقة الموصل

طلال محمود الصفار
كلية الطب البيطري / جامعة الموصل
خشوص

الخلاصة

استهدفت الدراسة بعض التغييرات الدموية والكيميائية في الأغنام المصابية بمرض حلزون الكبد المزمن في منطقة الموصل (خمسون رأسا من الضأن العوالي ثلاثون من الذكور وعشرون من الإناث وبعمر 1-5 سنة) من مجزرة الموصل وكذلك من فحص براز الأغنام المصابية بمرض حلزون الكبد المزمن، ثم مرض حلزون الكبد المزمن في الأغنام يعتبر مهم من الناحية الاقتصادية وخاصة في البلدان التي تتم تربية وإنتاج الأغنام. والأهمية الأساسية للمرضية هي تلف ويرى والانسداد الانتقائي للإسفنج. أوضح بان نتائج الدراسة التغييرات التالية في الدم: نقصان في كمية خضاب الدم، وحجم الخلايا المصرصية أو الخلايا PCV، وكذلك هبوط في عدد كريات الدم الحمراء وكمية ESR، مع زيادة في معدل ترشيب الدم، وحجم الكريات الحمراء، ومقدار في كمية البروتينات الكلية في المصل. في الحيوانات المصابية بالنيرس مقارنة مع نتائج عيدات الأغنام مجموع أخرى في المنطقة السيطرة (الاغنام غير المصابة بالمرض).