FIRST DETECTION OF CRYPTOSPORIDIOUM SPP. IN BROILER CHICKENS IN SYRIA

Morshed Kassouha

Department of Microbiology, College of Veterinary Medicine,
University of Hama, Hama, Syria.
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ABSTRACT

Fifty nine samples of feces were collected from broiler flocks farms located in Hama and Aleppo provinces of Syria, which suffered from diarrhea or respiratory problem or both. For the first time, this study confirmed the infection of the broiler flocks with Cryptosporidium in Syria with a rate of 8.4%. The infection has been demonstrated by detecting the Cryptosporidium oocysts in the fecal by using direct smear method and Formol-Ether concentration method, then stained by Kinyoun acid fast stain.

The result of tests based on morphology and size of Cryptosporidium oocysts showed that the parasite is probably C. baileyi which ranged between (6 μm X 4 μm).

This study showed a difference in the percentages of infection according to the methods in which Cryptosporidium oocysts has been detected, as the Formol-Ether method detected the oocysts in 8.4% of all samples, while the direct smear method detected the oocysts in 6.7%.
INTRODUCTION

Cryptosporidia are small coccidian parasites that were recently recognized as significant pathogens of humans and many other vertebrate species[1,2,3]. The Cryptosporidium infection in birds was first described by Tyzzer in 1929[4], in the cecal epithelium of young chickens. The three valid Cryptosporidium species infect birds: C. baileyi, C. meleagridis and C. galli[5,6].

Naturally occurring cryptosporidiosis in birds manifests itself in three clinical forms; respiratory disease, enteritis and renal disease, and the parasite has been found in many sites inside the birds including the conjunctiva, nasopharynx, trachea, bronchi, air sacs, small intestine, large intestine, ceca, cloaca, bursa of fabricius, kidneys and urinary tract. Usually only one form of the disease is present in an outbreak[7]. At present no effective chemotherapy is available for the treatment of avian cryptosporidiosis[7,8].

Although there are intensive studies and huge amount of information about the cryptosporidiosis prevalence in chickens from Europe, united states, American Latin countries and Japan[9,10,11,12,13], we found no previous studies on Cryptosporidium infections of chickens in Syria.

MATERIALS AND METHODS

3-4 fresh drops have been polled in one container from each of fifty nine suspected broiler flocks and then mixed with 2.5 % K₂Cr₂O₇ and kept at 4°C. The suspected flocks suffered from respiratory or digestive problems or both, and all farms located in two provinces of Syria (Hama and Aleppo).
Before the examination, the specimen was washed three times with distilled water by centrifugation 1100 x g for 5 min. After washing from potassium dichromate, direct smear (D-S) was made and stained with Kinyoun acid fast stain [14,15].

Formol-Ether concentration method (F-E) has been administrated on 1ml of washed specimens, and the sediment (figure -1) also stained with Kinyoun acid fast to confirm the result [16].

**Fig.1: a sample after Formol-Ether method**

**RESULTS**

In this study 5 out of 59 (8.4%) samples were tested positive, one of them was collected from Aleppo province with rate 12.5% (1/8), and the other four positive samples were from Hama province with rate 7.8% (4/51). (Table-1)

In the positive samples under microscope at x 1000 the oocysts look like red or pink spherical bodies against blue background of methylene blue and sometimes the sporozoites can be seen inside it (figure-2).

All oocysts detected ranged in measure 6 μm X 4 μm, and this measurement indicates to *C. baileyi* -like oocyst.
Fig.2: Cryptosporidium oocysts, (x2000, kinyoun stain)

Only four samples were detected using direct smear ((D-S)). Conversely, Formol-Ether concentration method ((F-E)) was able to diagnose all five positive samples. (Table-1)

<table>
<thead>
<tr>
<th>Source of Sample</th>
<th>D-S method</th>
<th>F-E method</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Hama (51)</td>
<td>4</td>
<td>7.8</td>
<td>4</td>
</tr>
<tr>
<td>Aleppo (8)</td>
<td>0</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Total (59)</td>
<td>4</td>
<td>6.7</td>
<td>5</td>
</tr>
</tbody>
</table>

DISCUSSION

Just few papers we found about cryptosporidiosis in man and other mammals in Syria, but no one was carried out about Cryptosporidium in birds.

In this study we confirmed for the first time the presence of
Cryptosporidium infections In 8.4 % of examined fecal samples from broiler farms in two provinces of Syria.

This rate of infection is low if compared to study from North Carolina [9] that reported 27.3% (9/33), and to another from Greece [12] 24% (17/70), and also low in comparing with two histological studies from northern Georgia [17] and Scotland [11], whereat the parasites were detected in trachea 41% (23/56) and bursa of Fabricius18.7% (26/139), respectively. Otherwise our result was close to that of Georgia [10] which noted the parasite in 6.4% of samples histologically. These differences in infection rates may be due to different environments or different diagnostic methods.

Importance of cryptosporidiosis in chickens has increased recently, especially as it is possibility to be combine with some of the other pathogens and causes greater economic losses, and there are scientific reports pointed to the possibility of participating cryptosporidium with both Rio viruses [18] and Marek's Disease Virus [19] resulting in increased mortality and low weight, and it should not be forgotten that cryptosporidium infect bursa of Fabricius and cause suppression for immunity, which in turn leads to a lot of bad influences and that might not notice immediately.

In the end, it is necessary to increase the interest and study about of cryptosporidiosis in chickens in Syria and other Arab countries and typing of existing species genetically by PCR-RFLP analysis.
الكشف لأول مرة عن البوعيات الخفية عند دجاج اللحم في سورية

مرشد كاسوحة

فرع الاحياء المجهرية لكلية الطب البيطري، جامعة حماة، الجمهورية العربية السورية

الخلاصة

جُمعت تسع وخمسون عينة من مزارع دجاج اللحم في محافظتي حماة وحلب من سورية عانت طيورها من مشاكل تنفسية أو إسهالات أو من الاثنين معا. أثبتت الدراسة لأول مرة إصابة قطعان دجاج اللحم بالبوعيات الخفية في سورية بنسبة 8.4%. إذ تم ثبوت وجود الإصابة من خلال الكشف عن كياسات بيض البوعيات الخفية في عينات الزرقة باستخدام طريقة اللطخة المباشرة، وطريقة الفورمول – أي الركزية ثم تم تشخيص الصبغة بطريقة كيتوس. وينت تنتائج الاختبارات بدأ على الخصائص الشكلية وقياس أبعاد الكياسات البيضية بأن الطفيلي قد يكون من نوع C. baileyi حيث كانت ابعادها بين 4 µm x 6 µm وأظهرت الدراسة اختلاف نسبة الإصابة بحسب كل طريقة من الطرق التي تستخدم في الكشف عن كياسات بيض البوعيات الخفية، حيث كشفت طريقة اللطخة المباشرة عن احتمال وجود كياسات بيض البوعيات الخفية في 6.7% من العينات المختبرة.

REFERENCES


