Prevalence of Poultry Coccidiosis in and Around Yabello, Southern Ethiopia

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Abstract: This study was conducted in and around Yabello, southern Ethiopia, with the objective of determining the prevalence of poultry coccidiosis and its associated risk factors. Faecal samples were collected from total of 384 chickens. Floatation technique was used to detect coccidial oocyst. The result revealed that out of 384 chickens, 74 were positive for coccidiosis and overall prevalence was 19.3%. The frequency of detection of oocyst in the faecal samples from exotic and local breed chicken were 18% and 20.4%, respectively. The result of current study disclosed that the prevalence of coccidiosis was almost similar in female (19.6%) and male (18.2%) chickens. The prevalence rates of 18.4% and 21.9% were recorded in chicken grouped under the age category of 2-8 weeks (young) and greater than 8 weeks (adult), respectively. The prevalence rates of 21.6% and 18% were also recorded in good and poor body condition, respectively. Furthermore, Coccidiosis occurrence in intensive and extensive management system were 22.1% and 16.7%, respectively. In conclusion, even though the difference for all risk factors was statistically insignificant (p>0.05), the study shown that coccidiosis is important disease of poultry in Yabello district, southern Ethiopia and this is an indication for intervention to tackle the disease without any priority within the risk factors.

Key words: Coccidiosis · Poultry · Prevalence · Yabello district

INTRODUCTION

Poultry coccidian are strictly host-specific and the different species parasitize specific parts of the intestine. The disease is characterized by droppiness, paleness of the comb, diarrhoea and occasional appearance of blood in droppings [1]. The oocysts exist in the litter, premises and are distributed by clothes, shoes, dust and others [2]. Several factors influence the severity of infection like age and the number of oocysts eaten [3]. The most common and pathogenic species that affect the poultry is *Emerizatennella*, resulting in 100% morbidity and a high mortality due to extensive damage of digestive tract [4]. Poultry Coccidiosis are responsible for tremendous worldwide economic losses [5].

In Ethiopia some reports indicated that coccidiosis loss from 8.4 & 11.86% profit in large and small scale farms, respectively [6]. Losses due to mortality following a severe outbreak may be devastating and incidence rates as high as 80% were sometimes observed in the country [7]. Although there are some previous works done on poultry coccidiosis in different regions of Ethiopia, there is no any literature documentation in this study area. Therefore, this study was designed with the objectives of determining the prevalence of poultry coccidiosis and identify the associated risk factors.

MATERIALS AND METHODS

Study Area: The study was conducted in and around Yabello district, southern Ethiopia from November 2015 to April 2016. The area is located in Oromia regional state situated at 565 km south of Addis Ababa and geographically located at 50° 23’ 49” N latitude 39° 31’ 52” E longitudes with elevation 1857 Meters. The study region is characterized by bimodal rainfall with 60% occurring in the long rainy season extending from mid-March to May and erratic short rain season from mid-September through mid-November. Other seasons such as the cool dry season extending from June to August and the major dry season from December to February [8]. The farming system comprises of mainly pastoral area and seldom Agro-pastoral areas. The region has predominantly a semi-arid climate. The annual temperature varies between
21°C and 38°C and the rainfall ranges from 350mm to 900mm, with considerable spatial and temporal variability in quantities and distribution. The area holds 1,496,652 cattle, 452,177 goats, 193,021 sheep, 467,119 camels, 355,700 chickens, 13,945 mules, 61,699 donkeys. Both local and exotic poultry breeds are available in the study area [9].

**Study Population:** The study was conducted on poultry found in and around Yabello district by dividing them into sex, breeds and ages as young (2 – 8 weeks) and adult above 8 weeks of age [10]. This range of age was selected because the disease is more common in young poultry [11]. Systematic random sampling was used to select the study population from the study area. Epidemiological information regarding ages, sex, breed, body condition and housing type, date of sample collection and origin name of the farm were collected.

**Study design and Data collection:** A cross-sectional study was conducted from November 2015 to April 2016 to estimate the prevalence and risk factors of poultry coccidiosis in and around Yabello. Data was gathered from randomly selected chickens. Age, sex, breed, body condition and housing type were considered as risk factors to test for occurrence of coccidiosis.

A total of 384 fecal samples were collected during the entire period of the study directly from the rectum of selected animals using spatula and from freshly dropped feces excluding soil contamination after wearing disposable plastic gloves and placed into air tight sample vials and transported to Yabello Regional Laboratory on the same day of collection and preserved at refrigeration temperature until processing within 48 hours. During sampling date of sample collection, age, sex, breed, body condition and management system were recorded for each sampled animal. Fecal sample was qualitatively examined by centrifugation floatation technique.

Data Management and Analysis: Data collected from the study sites were coded and entered in to a Microsoft excel spreadsheet program for analysis. Statistical analysis was done on Statistical package for Social sciences (SPSS) software version 16. Descriptive statistics like percentage was used to express prevalence while chi-square (X²) test was used to compare the association between variables and a statistically significant association between variables was considered at p-value less than 0.05.

**RESULT**

Out of 384 fecal samples examined, 74 were found to be positive for Eimeria oocysts with the overall prevalence of 19.3%. The highest prevalence rate (22.1%) was observed in chicken which reared in intensive management system and the lowest prevalence rate (16.7%) was observed in extensive management system. The prevalence rates of 18.4% and 21.9% were recorded in chicken grouped under the age category of 2-8 weeks (young) and greater than 8 weeks (adult), respectively. The prevalence rates of 18% and 21.6% were also recorded in good and poor body condition, respectively. As shown in Table 1, the prevalence of coccidiosis was relatively different in different risk factors. However, difference between all risk factors was not statistically significant (p>0.05).

**DISCUSSIONS**

Coccidiosis is the most prevalent and important disease of poultry production and its prevalence and economic significance has been reviewed by different workers in different production system [12]. The result of the present study illustrate that poultry coccidiosis is endemic in and around Yabello, southern Ethiopia, with an overall prevalence of 19.3% (74/384). The present result agreed with the previous finding in central Ethiopia.

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>Category</th>
<th>No. examined</th>
<th>Positive</th>
<th>Prevalence</th>
<th>Chi- square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Male</td>
<td>99</td>
<td>18</td>
<td>18.2%</td>
<td>0.102</td>
<td>0.750</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>285</td>
<td>56</td>
<td>19.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Adult</td>
<td>96</td>
<td>21</td>
<td>21.9%</td>
<td>0.558</td>
<td>0.455</td>
</tr>
<tr>
<td></td>
<td>Young</td>
<td>288</td>
<td>53</td>
<td>18.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breed</td>
<td>Local</td>
<td>206</td>
<td>42</td>
<td>20.4%</td>
<td>0.357</td>
<td>0.550</td>
</tr>
<tr>
<td></td>
<td>Exotic</td>
<td>178</td>
<td>32</td>
<td>18.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management system</td>
<td>Extensive</td>
<td>203</td>
<td>34</td>
<td>16.7%</td>
<td>1.761</td>
<td>0.185</td>
</tr>
<tr>
<td></td>
<td>Intensive</td>
<td>181</td>
<td>40</td>
<td>22.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body condition</td>
<td>Good</td>
<td>250</td>
<td>45</td>
<td>18%</td>
<td>0.744</td>
<td>0.388</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>134</td>
<td>29</td>
<td>21.6%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Prevalence of coccidiosis by age, sex, body condition, breed & management type
and Addis Ababa [14] with prevalence rate of 25.8% & 23.1%, respectively. Moreover, this result was in agreement with the finding in Ambo [10] who reported a prevalence of 20.57%. However, the present result in the prevalence of coccidiosis is much lower than the findings of Dinka and Yacob in DebreZeit, Ethiopia (71.1%)[15] and Alemargot in AdissAbeba (80%). This variation in prevalence of the disease may be due to epidemiology of coccidian infection and differences in management systems of the farms. The result of current study revealed that the prevalence of coccidiosis was almost similar in both female (19.6%) and male (18.2%) chicken. This may be due to equal chance of exposure for parasitic infection. This result agreed with report of previous studies such as Oljira et al., (2012) who reported a higher prevalence of poultry coccidiosis in female chickens than male chickens. This variation in prevalence of the disease may be due to climatic condition of coccidian infection and differences in management systems of the farms. However, the present result disagrees with the finding Alemayehu et al. (2012) in Addis Ababa and Gebretensae et al. (2014) in Gondar who reported that a higher prevalence of poultry coccidiosis in male chickens than female chickens.

This study also indicated that the prevalence of coccidiosis was relatively higher in adult (greater than 8 weeks) 21.9% than young (2-8 weeks) 18.4% chickens. It was observed that there was no statistically significant difference (p>0.05) in the prevalence of coccidiosis among the two different age groups examined. However, slight variation was observed between the age categories.

The prevalence of coccidiosis was relatively higher in local 20.4% than exotic 18.4%. This result agrees with the finding of Gebretensae et al. (2014) in Gonder who stated that the prevalence rate of coccidiosis was relatively higher in those local than exotic breeds, due to locals are allowed to scavenge in villages without any restriction and thus more likely get contact with the sporulated oocysts in feaces, which are the main sources of infection and might be due to concurrent parasitosis which are common in local chickens kept under traditional management system. The effect of body condition on the prevalence of the disease was assessed and relatively high prevalence was recorded in those chickens which have poor body (21.6%) than those chickens which have good body condition (18%). Chickens which are managed in intensive housing system were more affected (22.1%) than extensive (16.7%) housing systems. This result in line with report of previous studies such as Taylor and his co-workers [16] who reported that coccidiosis was the most common problem to chickens kept under intensive management system especially those on deep litter management.

**CONCLUSION**

The present study disclosed that coccidiosis is prevalent in the study area. Even if the association between different risk factors are not statistically significant, still the disease has great socio-economic impact. Therefore, Biosecurity practices should be a primary concept in the prevention and control of coccidiosis. Awareness should be a created among the local chicken farmers through training on general knowledge of coccidiosis occurrence, medication procedures and prevention and control methods should be undertaken for sustainable control. Moreover, Stress conditions such as overcrowding should be minimized by reducing the number of chicken in intensive housing which triggers the disease occurrence.

**REFERENCES**


