IN-VIVO EVALUATION OF ANTI-COCCIDIAL EFFICACY OF SALINOMYCIN AND AMPROLIUM IN COMMERCIAL CHICKEN

R. Selvarani*, M. Raman and S. Gomathinayagam

Department of Veterinary Parasitology
Madras Veterinary College, TANUVAS, Chennai 600 007.

ABSTRACT

In-vivo evaluation of the efficacy of test anti-coccidial efficacy of salinomycin and amprolium carried out in two different trials in 228 commercial chicken revealed 100% efficacy against mixed eimeria sp on comparative evaluation with standard in-feed anti-coccidials. There was marked reduction in the oocyst output with increased body weight gain and improved feed conversion efficiency in the experimental study.

Key words: Commercial chicken, anti-coccidial efficacy, salinomycin, amprolium.

INTRODUCTION

Coccidiosis is one of the most common and highly pathogenic obligatory enteric protozoan affecting poultry in India. Recent study conducted on the economic loss due to chicken coccidiosis was estimated to be around Rs. 1.5 billion in India (Beraa et al., 2010). Coccidiosis is considered as ubiquitous in poultry management, since even under the extreme conditions of the experimental work, it is very difficult to avoid infection completely for any length of time. Hence control of the disease is highly dependant on the use of in-feed coccidiostat and chemotherapeutic coccidiocidal drugs for commercial poultry. In the present study, the anti-coccidial efficacy of salinomycin and amprolium was evaluated in commercial chicken following the guidelines of European commission on techniques in coccidiosis research (Eckert et al., 1995) and that of World Association for Advancement of Veterinary Parasitology (WAAVP) (Holdsworth et al., 2004).

MATERIALS AND METHODS

Experimental birds:

Day old broiler chicks (Ross chicks) obtained from commercial broiler breeder (Suguna poultry Pvt Ltd, Coimbatore) were maintained in brooders for two weeks under ideal experimental conditions. They were fed with coccidiostat free commercial broiler starter during the above period. The chicks

Corresponding author Email: vetselvaindia87@gmail.com

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were then transferred to elevated cages from day 14 to till the end of the experiment.

**Experimental design for trial –I**

The first experimental trial was carried out in 96 commercial chicken to assess the anti-coccidial efficacy of test salinomycin drug in 8 treatment groups on comparison with standard salinomycin drug. The following drug concentrations were designed to evaluate the efficacy of both study and standard salinomycin drug namely 48 ppm, 60 ppm and 72 ppm. In each concentration, 12 chicks were taken up in two replicates. From day 14, chicks were fed with three concentrations of the drugs of study and standard salinomycin. The birds were then challenged with 20,000 oocyst of mixed *Eimeria* species on day 19.

**Experimental design for trial –II**

In the second experimental trial for testing the efficacy of amprolium, 14 treatment groups were formed with two types of challenges, namely low oocyst count with trickle challenge (5000 oocyst) during 3rd week and 5th week of the study. Three doses of drugs were evaluated namely 1.2g/lit, 1.8g/lit, 2.4g/lit for both study and standard drugs. In addition there was an infected and unmediated group. The study and standard amprolium drugs were given in water following the single and multiple challenges for 3-4 days. This trial was carried out in 132 commercial chicken to assess the anti-coccidial efficacy of test amprolium drug on comparison with standard amprolium drug. In each concentration, 12 chicks were taken up in two replicates and the drugs were given in drinking water.

**Collection and Processing of poultry droppings**

About 360 g of faecal samples were collected from each treatment group everyday in an air tight pre-labeled zip lock cover. The samples were transported to lab and homogenized by properly mixing with 0.5 mm glass beads (Biospec, USA) and water. The mixture was sieved thoroughly by using 1mm diameter sieve cloths. The process was repeated several times to remove completely the gross impurities, fibres and other materials from samples collected from poultry cages. About 1ml (equivalent of 1g) of aliquot was pipetted from the sieved suspension into test tube containing 9ml of saturated salt solution. After thorough mixing, an aliquot was charged into triple chambered McMaster slide (Chalex Corporation, USA) and were kept undisturbed for 10 minutes.

The homogenized mixtures were added with 2.5% potassium dichromate solution and were transferred to wide mouth containers for sporulation. The sporulation process was enhanced using aerators that were placed in all the containers (Soulsby,1982)

**Estimation of total oocyst count:**

Mixed aliquot from each sample was charged into triple chambered McMaster slide to assess the oocyst per gram (OPG) and total output was also arrived for each treatment group. The various species of *Eimeria* were identified by using standard identification key (Levine, 1985) for all the samples and the ratio was assessed.
Lesion scoring technique:

All the birds that are sacrificed were subjected to lesion scoring technique to assess the effect of treatment with different doses of salinomycin. The lesions in various parts of intestine were assessed based on the gross and microscopical changes along with OPG and presence of schizonts in the parts that were examined.

RESULTS AND DISCUSSION

Efficacy of salinomycin drug on coccidiosis

In the salinomycin treated group, the oocysts output started increasing gradually from a minimum of 99 to 948 during the third and fourth week of age with high count of oocysts observed in 48 and 60 ppm dose level than in the 72 ppm level. However the FCR in the study salinomycin drug is much lower than the standard salinomycin drug during this period (Engberg et al., 2000, Lee et al 2013). Hence this indicates the efficiency of the study salinomycin drug is almost similar to that of standard salinomycin drug. Since body weight gain is very crucial for commercial broilers at III and IV week, the study salinomycin drug is considered as effective (Johansen et al 2007) as standard salinomycin drug. On the contrary during the fifth and sixth week of age, the oocysts counts were highest in 60ppm group (Table1).

<table>
<thead>
<tr>
<th>period</th>
<th>FCR</th>
<th>Mean OPG</th>
<th>PCV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Study</td>
<td>Standard</td>
<td>48ppm</td>
</tr>
<tr>
<td>1st week</td>
<td>1.24-1.48</td>
<td>-</td>
<td>28.8</td>
</tr>
<tr>
<td>2nd Week</td>
<td>1.23-1.70</td>
<td>-</td>
<td>28.9</td>
</tr>
<tr>
<td>3rd Week</td>
<td>1.19-1.70</td>
<td>99-948</td>
<td>28.3</td>
</tr>
<tr>
<td>4th Week</td>
<td>1.40-2.80</td>
<td>84-3633</td>
<td>28.4</td>
</tr>
<tr>
<td>5th Week</td>
<td>1.58-3.0</td>
<td>219-4794</td>
<td>26.0</td>
</tr>
<tr>
<td>6th week</td>
<td>1.70-2.74</td>
<td>462-15276</td>
<td>28.0</td>
</tr>
</tbody>
</table>

FCR were almost similar in both study and standard drug. Hence it is considered that the efficacy of study drug is similar to that of standard drug.

Table 1. Efficacy of salinomycin drug on coccidiosis
**Table 2. Efficacy of amprolium drug on coccidiosis**

<table>
<thead>
<tr>
<th>Groups</th>
<th>First challenge</th>
<th>Second challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before treatment</td>
<td>After treatment</td>
</tr>
<tr>
<td>T1-T14</td>
<td>FCR Mean OPG</td>
<td>FCR Mean OPG</td>
</tr>
<tr>
<td></td>
<td>1.52- 0- 1.48- 0-</td>
<td>1.48- 0- 1.48- 0-</td>
</tr>
<tr>
<td></td>
<td>1.63 12464</td>
<td>1.62 10980</td>
</tr>
</tbody>
</table>

The pre-treatment mean OPG values were in the higher range of 8000-10000 in the single high dose challenge group than the low dose trickle challenge group. After treatment, a marked reduction in the mean OPG values was observed in both the groups (Sherkov Sh.1977).

It was observed that the body weight gain and FCR has improved much following the treatment with amprolium in all the three dose levels of both study and standard amprolium drugs (Mahmoud Kandeel 2011). The mean body weight gain improved in chicks of all the treatment groups following treatment with study and standard amprolium. Likewise the FCR values also declined in all the treatment groups following the study and standard treatment. This has indicated that the study amprolium drug is as effective as standard amprolium drug.

**REFERENCE**


