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Effectiveness study of sulfaclozine sodium as anticoccidial drug by counting litter oocyst in some broiler farms at Sirajgonj District in Bangladesh

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Abstract: Effectiveness study of sulfaclozine as anticoccidial drug by counting litter oocyst were carried out on a total of 12 broiler farms at Sirajgonj District in Bangladesh. For this study 12 broiler farms were selected randomly and kept under close observation for the natural outbreaks of coccidiosis in a period of one broiler crop grow out. Poultry rearing and farm management systems followed in all farms were almost same. Litter samples were collected following same procedure in every week throughout the experimental period both before and after treatment with four (04) commercially available sulfaclozine Na preparations. The number of oocysts per gram (OPG) of litter was calculated following McMaster method. Huge number of oocyst was counted after outbreaks but before treatment of coccidiosis in almost every farm and after treatment oocyst were found significantly ($P < 0.01$) reduced in number. From the study it was concluded that use of sulfaclozine Na in the treatment and prevention of coccidiosis was found still now effective.
Keywords: Effectiveness, sulfaclozine, coccidian oocyst, litter, broiler

INTRODUCTION

Coccidiosis is one of the most relevant diseases concerning economic losses on poultry production. The world losses attributable to avian coccidiosis were estimated in 1.5 billion dollar per year [1]. Despite the introduction of live vaccines, in most countries chemotherapy is still the preferred method for the control of coccidiosis. Significant improvements in the performance of commercially reared poultry have been made during the last half of the twentieth century. It has often been assumed that these improvements would not have been possible without the introduction of a succession of ever more effective anticoccidial agents to control coccidiosis [2]. Without anticoccidial drugs and vaccines, the growth of the broiler industry would have been impossible, as coccidia are ubiquitous and extremely deleterious to the growth and survival of broilers. Coccidial infection in broiler chickens is very common despite depopulation and cleaning programmes and the use of anticoccidial drugs. It is well established that coccidial oocysts are widely distributed in the litter. It has been shown by [3] that it is possible to assess the level of coccidial infection by estimating the numbers of oocysts in a few samples of the broiler house litter. It was demonstrated that reliable estimates could be made from samples taken after the 3rd week and thus the effectiveness of anticoccidial drugs could be evaluated in broiler chickens by examining litter samples at regular intervals. Fortunately, introduction of the sulfonamide drugs in the 1930s started an era of treating and preventing coccidiosis. Sulfonamides have a broad spectrum of activity against Eimeria spp. of the anterior and lower part of the intestine in chickens. Sulfonamides have a good coccidiostatic effects on control and treatment of chicken coccidiosis in experimental and natural infection [4,5]. Feeding of sulfonamides may prevent clinical signs and reduce oocyst production thereby allowing development of protective immunity. Also, they could completely inhibit the oocyst shedding and repaired lesions of intestine in infected groups one week after treatment. Coccidial infections are also common in poultry in which several species *of Eimeria* are known to produce pathogenic effects. However, no information is available on the frequency of coccidiosis in broiler in Bangladesh or the numbers of resistant stages (oocysts) present in litter. The present investigation is concerned with estimates of the numbers of oocysts present in litter samples taken from twelve different farms both before and after sulfaclozine treatment in natural infection after day old poults were housed and the investigation of efficacy of sulfaclozine against natural

outbreaks of coccidiosis in broiler at Sirajgonj district in Bangladesh based on counting of litter oocyst per gram (OPG).

MATERIALS AND METHODS

Materials

Selection of experimental Farms

The experimental farms were randomly selected for this study irrespective to the location, age of the farms, flock size, experience of the farmers, history of the previous coccidiosis outbreaks, existing control measures for the prevention of coccidiosis etc.

Chicks

One –day-old chicks "Starbroo" collected from Renata Agro limited, Gazipur and reared in different farms for this study

Farm management and poultry rearing

Poultry rearing and farm management systems followed in all farms were almost same including brooding, feeding and drinking, litter management & immunization etc.

Experimental drugs

The coccidiosis affected farm were treated with same drug sulfaclozine but collected from four commercially available sources as per manufacturer's dosage instruction. The detail was given in a table -1:

Table-1: List of Experimental drugs and their details

Serial No.	Name of drug	Name of farms	Dose	Route
01	Coccino® (Sulfaclozine)	Motiar farm	2.5 gm/L of water	Orally with water
02		Emdad poultry farm		
03		S. Ali poultry farm		
04	SCZ® (Sulfaclozine)	Ichamuti poultry farm	2gm/L of water	
05		Sadek poultry farm		
06		Zehan poultry farm		
07	Coccicure® (Sulfaclozine)	Anwar poultry farm	2.5 gm/L of water	
08		Sayed Ali farm		
09		Bariq farm		
10	Esb3-30% ® (Sulfaclozine)	Mamun poultry farm	2gm/L of water	
11		Aiyub poultry farm		
12		Miah poultry farm		

METHODS

Diagnosis of Coccidiosis

Eimeria identification depended on necropsy and microscopic examination of faeces irrespective to species variation.

Collection of litter sample

Litter samples were collected every week throughout the experimental period. A total of five samples collected from four corners and from center of the pen. The same procedure was followed in each farm. The samples were collected in properly labeled polythene bags, and were brought to the district veterinary hospital laboratory, Sirajgonj, Bangladesh.

Preparation of litter sample for ocysts count

Five grams litter from the well mixed samples collected from each of the 12 farms pens was put in to three separate bottles filled with water and left at the refrigerator overnight. Next morning the bottles were shacked vigorously to dislodge the ocyst from litter cake where applicable.

Counting of litter ocyst

The sample from the bottle was sieved by using a 150µm sieve to remove the large particles. Then the filtrate was centrifuged at 1100gm for 5 minutes. The supernatant was discarded. The sediment was resuspended in saturated salt solution and made up 150 ml im measuring cylinder. The suspension was mixed thoroughly by gently inverting the cylinder 15-20 times. Adequate amount of suspension was taken by plastic Pasteur pipette as quickly as possible and two chambers of the McMaster counting slide were filled with the suspension. The slide was left for 3-5 minutes to allow the oocysts to float. The numbers of oocysts in two chambers were counted by using the x 6 eyepiece and x 10 objective of a compound microscope. The number of oocysts per gram (OPG) of litter was calculated by dividing the number by 0.3 and multiplied by dilution factor. The number of oocysts per gram of litter was calculated by the following formula:

Number in one gram = Number in two chamber/0.3 X dilution factor

Dilution factor = Total volume of suspension in ml/ total volume of faeces

Statistical Analysis

The data of the oocyst count both before and after treatment were analyzed statistically using T- test.

RESULTS AND DISCUSSIONS

Twelve broiler farms were selected and kept under continuous observation for the natural outbreaks of coccidiosis (irrespective of Eimeria spp) and birds of all farms were found coccidia affected at different age group. The degree of severity of the disease was low in first day of affection and after one or two days it was more severe than first day of commencement of coccidiosis. Huge number of oocyst was counted after outbreaks but before treatment of coccidiosis in almost every farm. After 3 days of treatment with sulfaclozine, oocyst were found significantly ($P < 0.01$) reduced in numbers which shown in table-2.

Table 2: Oocyst counts per gram (OPG) of litter before and after treatment with different commercial products of sulfaclozine against coccidiosis in different broiler farms

Serial No.	Name of farms	Total no. of Chicks	Time of Occurrence of Disease(age)	Total Ocyst count (OPG) (mean± SE) Before treatment	Total Ocyst count (OPG) (mean± SE) After treatment	% decrease
01	Aiyub poultry farm	400	10th day	5998.7± 22.744	156.40± 3.93	97.39
02	Bariq farm	450	15th day	5211.2± 42.85	93.50 ± 2.27	98.20
03	Motiar farm	500	7th day	5580.8± 36.5	152.80± 3.40	97.26
04	Sayed Ali farm	300	20th day	7341.41± 35.22	64.10± 0.55	99.12
05	Ichamuti poultry farm	1000	16th day	6359.9± 38.38	130.51± 0.39	97.94
06	S. Ali poultry farm	1500	19th day	5331.2 ± 31.29	230.00± 5.77	95.68
07	Miah poultry farm	1200	12th day	8632± 33.07	35.50 ± 4.59	99.61
08	Sadek poultry farm	800	17th day	5956.8± 24.09	129.00 ± 13.03	97.83
09	Anwar poultry farm	750	13th day	6520.5± 31.86	217.30± 3.60	96.66
10	Mamun poultry farm	600	23rd day	5680.40± 29.73	50.30 ± 4.16	99.11
11	Emdad poultry farm	850	22th day	5292.60 ± 33.03	137.50± 5.61	98.03
12	Zehan poultry farm	1300	14th day	6987.70± 28.52	137.50± 5.61	98.03

Values above are mean ±SE of 10 litter samples

The disease occurrence happened as early on 7th day in one farm and in late on 23 day in another farm. This might be due to the variation in the number of coccidian oocysts in litter that were persisted during previous broiler crop, flock to flock floor and litter management and previous coccidian outbreaks. The total number of ocyst per gram of litter (OPG) counted before treatment in all farm were found closest to each other indicated that the farm management in particular broiler crop during study period were almost similar in every farms. This finding was in accordance with the findings of [6-10]. In this study before treatment oocyst per gram (OPG) ranged between 5211.2± 42.85 to 7341.41± 35.22 which differed the OPG found in another study conducted by[11] on free range chicken in Thabet, Tunisia where OPG ranged 11644.23 ± 1987.3 in summer to 38251.33 ± 1488.2in Autumn. This variation might be due to the differences in poultry species, geography and poultry rearing system. After treatment with sulfaclozine, it has been found that in every farm the reduction of oocyst was found significant ($P < 0.01$) and the percent of decrease varied from 95.68 % lowest to 99.66% highest. In every cases the percent decrease were found closest to each other indicated that the drug sulfaclozine irrespective to commercial preparation available in Bangladesh and used in this study were found still now effective in the treatment of clinical coccidiosis. This finding is in agreement with the findings of the study conducted by [12-14] in broiler and [15, 16] in chicken.

CONCLUSION:

From the study it was concluded that sulfaclozine –Na was found still now effective in the treatment of clinical coccidiosis as well as prevention of the disease irrespective to the different available commercial preparations.

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