

EIMERIOSIS IN POULTRY OF RAWALPINDI/ISLAMABAD AREA

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ABSTRACT

This study was designed to determine the prevalence of eimeriosis in poultry and identify potential risk factors for its spread in Rawalpindi/Islamabad area of Pakistan. Of 359 gut samples (suspected for harbouring eimeriosis) examined, 258 (71.86%) were found infected. Four species of *Eimeria* (*E. maxima*, 34.10%, *E. tenella*, 30.62%, *E. mitis*, 13.95% and *E. necatrix*, 7.75%) were recorded. The prevalence of eimeriosis was highest in the month of September (89.74%), while lowest during June (28.57%). The disease was more common at the farms where the litter was wet and not managed properly.

Key words: Eimeriosis, prevalence, poultry.

INTRODUCTION

Eimeriosis is a disease of the intestinal lining of chickens caused by protozoan parasites of the genus, *Eimeria*. Chickens become infected with *Eimeria* by ingesting infective oocysts (eggs) from litter, soil and contaminated feed and water. The infected birds excrete oocysts into their faeces and are a source of infection for other birds. As *Eimeria* species can survive for long periods in infected birds and the environment, the parasite is ubiquitous wherever chickens are raised (McDougald, 2003).

The disease causes high mortality, morbidity and adverse effects on the growth of infected birds (Anjum, 1990). The incidence of eimeriosis in commercial poultry has increased due to higher stocking densities and intensive husbandry practices. It has been documented that it is the most consistently reported health problem in poultry (Biggs, 1982; Rose, 1987; Williams, 1999)

Different workers have investigated the prevalence of eimeriosis in different classes of poultry birds and in different areas of Pakistan (Dar and Anwar, 1981; Anjum, 1990; Ayaz *et al.*, 2003). The present study describes the prevalence of *Eimeria* species in poultry in Rawalpindi/Islamabad area of the country.

MATERIALS AND METHODS

Collection of samples

A total of 359 gut samples of poultry birds (broiler = 244, layer = 84 and breeder = 31) suspected for eimeriosis were collected from Poultry Research Institute (PRI), Rawalpindi and Poultry Diagnostic Laboratory, Murree Road, Rawalpindi, Pakistan from September, 2003 to June, 2005. All the intestines and caeca were opened and their contents (faeces) were collected in a beaker. The faeces were macerated

overnight in potassium dichromate solution at 37°C. The suspension was filtered through a muslin cloth and allowed to sediment. The supernatant was discarded and the oocysts in the sediment were separated by floatation method in saturated sodium chloride solution. They were examined microscopically and the species were identified on the basis of shape and size of sporocysts and sporozoites (Levine, 1985).

The samples found positive for eimeriosis were traced back to observe the management practices and determine potential risk factors for its spread. The litter and feed samples were also collected from the farms (n=130) to ascertain the source of infection. The feed samples were collected from the feed bags in the store of the poultry sheds. These feed samples were processed for isolates of *Eimeria* species by the method described by Levine (1985).

RESULTS AND DISCUSSION

Of 359 gut samples examined, 258 (71.86%) were infected. *E. maxima* had the highest prevalence rate (34.10%), followed by *E. tenella* (30.62%, Table 1). In broilers, *E. maxima* showed the highest prevalence (38.04%), followed by *E. tenella* (24.45%); whereas in layers and breeders, *E. tenella* showed the highest prevalence (38.88 and 65%, respectively, Table 1). These findings are partially in line with Ayaz *et al.* (2003), who recorded highest prevalence of *E. tenella* (50%) in poultry.

The disease was observed all around the year (Table 2) but the prevalence was higher in the months of September (89.74%), October (84.61%) and November (82.97%). This may be due to the high level of humidity in these months of the year. These results are in consonance with those of Dar and Anwar (1981).

The prevalence of eimeriosis was higher on farms where litter was wet (69.23%), as compared to those

Table 1: Distribution of different species of *Eimeria* in infected broilers, layers and breeders in Rawalpindi/Islamabad area

Species of <i>Eimeria</i>	No. of samples infected (%)			Total (N=258)
	Layer (n=54)	Broiler (n=184)	Breeder (n=20)	
<i>E. maxima</i>	20.37	38.04	35.0	34.10
<i>E. tenella</i>	38.88	24.45	65.0	30.62
<i>E. mitis</i>	11.11	16.30	-	3.95
<i>E. necatrix</i>	7.40	8.69	-	7.75
<i>E. maxim</i> & <i>E. tenella</i>	-	7.06	-	5.03
<i>E. maxima</i> , <i>E. tenella</i> & <i>E. mitis</i>	-	5.43	-	3.87
<i>E. maxima</i> & <i>E. necatrix</i>	22.22	-	-	4.56

Table 2: Prevalence of eimeriosis in suspected poultry guts during different months

Sr. No.	Months	No. of samples	
		Examined	Infested (%)
1	April	17	58.82
2	May	16	50.00
3	June	14	28.57
4	July	12	33.33
5	August	18	33.33
6	September	78	89.74
7	October	52	84.61
8	November	47	82.97
9	December	30	73.33
10	January	26	69.23
11	February	24	66.66
12	March	25	68.00

where it was dry (30.77%). The disease was more common in the birds of 22-42 days of age (70.75%, Table 3). A possible reason for this may be that during the period between 22-42 days of age the birds have not attained immunity against coccidiosis, resulting in the increased incidence of the disease.

Of 130 feed samples processed for isolation of *Eimeria* species, only one (0.76%) was found positive. The *Eimeria* identified was *E. maxima*. However, of 130 litter samples processed for isolation of *Eimeria* species, 110 (84.61%) were found infected. The species of *Eimeria* identified were *E. maxima*, *E. tenella*, *E. mitis* and *E. necatrix*. These results are in agreement with those of Williams (1995), who reported that at least six species of *Eimeria* (e.g., *E. acervulina*, *E. maxima*, *E. tenella*, *E. brunette*, *E. mitis* and *E. praecox*) were found in the litter from single flock during its first six weeks.

Table 3: Prevalence of eimeriosis in suspected poultry guts in different age groups

Sr. No.	Age (Days)	Prevalence (%)
1	1-7	0.00
2	8-14	0.00
3	15-21	5.38
4	22-28	24.61
5	29-35	35.38
6	36-42	10.76
7	43-49	1.53
8	49-56	9.20
9	57-63	4.61
10	64-70	1.53
11	78-84	3.84
12	252-259	1.53
13	274-280	1.53

Management of poultry houses plays a significant role in the spread of eimeriosis because coccidial oocysts are ubiquitous and are easily disseminated in the poultry house environment. Further, owing to their high reproduction potential, it is very difficult to keep chickens coccidia free, especially under current intensive rearing conditions. Oocysts sporulate readily in poultry house litter. However, they can be damaged by bacteria, other organisms and ammonia that are also present and their viability can begin to diminish after three weeks (Williams, 1995). It is a common practice of our progressive farmers to do a thorough cleanout between the flocks. This practice may help to control the widely spread menace of coccidiosis in the country as the effectiveness of anticoccidials continues to decrease. Other biocontrol measures such as requiring attendants to change clothes between houses can minimize the spread of infective oocysts. The findings of the present study indicate that contaminated litter is the major source of infection. Isolation of *Eimeria* species from feed sample indicates poor management of both storing feed stock and litter disposal.

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