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RESEARCH ARTICLE

PREVALENCE OF EIMERIOSIS IN DOMESTIC/FREE RANGE CHICKENS OF SOUTH KASHMIR, J AND K (INDIA)

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ABSTRACT

The present study was conducted from June 2011 to May 2012 to investigate the status of Eimeriosis in domestic/free range chickens of South Kashmir (India) with respect to age and season and to know the intensity of the infection. Out of total 169 representative samples of domestic/free range chickens, 50.89% were found infected. The infection was observed all around the year but the prevalence was highest during the winter season (70.27%), declined in spring (68.75%) and reached its minimum levels in summer season (29.27%) and started to rise in autumn (34.88%). 3-6 week age group of birds was most affected (70.31%) and >6 week age group was less affected (31.67%). 72.09%, 22.09% and 05.81% of the positive samples showed unapparent, low grade and heavy infections respectively with overall mean oocyst count of 834.94±672.01.

INTRODUCTION

Poultry production in India is distinctively divided into commercialized and village enterprise subsector, each with its peculiarities. The former comprises of strains specifically developed on the basis of primary products into parent stocks, layers, and broilers each with its specialized equipments and management approach (Nnadi and George, 2010). The latter however, consists of indigenous domestic fowls (*Gallus domesticus*) variously referred to as local or free range chickens. Coccidiosis is the major problem in poultry worldwide; leading to serious problems and causing huge economic losses to poultry industry, Jadhav *et al.* (2011). The occurrence of different *Eimeria* species combinations and the intensity of infection vary considerably, both globally and locally Oikawa *et al*. (1979), Williams (1996) and Amer *et al*. (2010) and with time Braunius, (1986) and Haug *et al*. (2008). Coccidiosis also causes weight loss, lower feed conversion rate, delayed sexual maturity and decrease of egg production. Lobago *et al.* (2005). Lesions of the intestinal mucosa and loss of pigmentation may also become apparent during the latter stages of infection Conway and McKenzie (1997), Mc Dougald and Reid (1997) and Amer *et al*. (2010).

MATERIAL AND METHODS

A total of 169 gut and faecal samples of domestic/free range chickens of different age groups and were collected randomly from different households of in different seasons, South Kashmir from June 2011 to May 2012. All the intestines and ceaca were opened and their contents (faeces) were collected in a beaker. The faeces were macerated overnight in potassium dichromate solution at 37 degree centigrade. The suspension was filtered through a muslin cloth and allowed to sediment. After discarding the supernatant, the oocysts in the sediment were separated by floatation method in saturated sodium chloride solution. Then a drop of sediment was examined first under low power and then under high power of compound microscope to identify the *Eimeria* oocysts (Levine, 1985). At the same time the intensity of the infection was determined by McMaster's oocyst-counting technique (Soulsby, 1982). Faecal samples were thoroughly homogenized by manual mixing. Then, a 9 g sample was weighed and soaked in 126 ml of water and allowed to stand overnight. Next morning, the samples were vigorously shaken to break up the feces. Then, each sample was sieved through a tea strainer. The strained samples were poured into a 15 ml centrifuge tube. The tubes were centrifuged at 2000 rpm for 5 min. The supernatant fluid was decanted and sediment was mixed with a saturated solution of sugar in the centrifuge tube. The suspension was thoroughly mixed and a sample was taken and placed in a McMaster's chamber. The number of oocysts within each ruled area, multiplied by 100 represents the number per gram of the original sample. For each coccidian oocysts positive sample, the intensities of the infection were categorized as described by Lawal *et al*. (2008) as follows: 1-10 oocysts per field = +1 (in apparent infection), 11-20 oocysts per field = +2 (low grade infection) and >20 oocysts per field = +3 (Heavy infection).

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RESULTS AND DISCUSSIONS

Seasonal estimation of the *Eimeria* infection revealed definite seasonal fluctuations, with highest infection in winter and lowest in summer season. The seasonal prevalence of the Eimeriosis in spring, summer, autumn and winter was 33(68.75%) positive samples out of 48 examined ones; 12(29.27%) out of 41; 15(34.88%) out of 43 and 26(70.27%) out of 37 examined samples respectively with p = 0.000 (Table 1).

Table 1. Seasonal prevalence of coccidiosis in host birds

Season	Examined	Infected	Prevalence	χ2(p-value)
Spring	48	33	68.75	
Summer	41	12	29.27	
Autumn	43	15	34.88	23.76 (0.000)
Winter	37	26	70.27	
Overall	169	86	50.89	

Age wise epidemiological observations were made which revealed highest prevalence rate in 3-6 week age group. Most of the positive cases were encountered in the age group of 3-6 weeks with 45(70.31%) positive samples out of 64 examined samples followed

by 22(48.88%) positive samples out of 45 in age group <3 weeks and 19(31.67%) positive samples out of 60 in age group >6 weeks (Fig. 1).

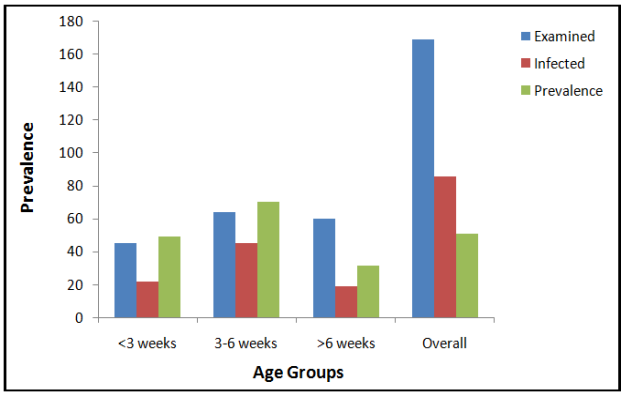

Fig.1. Prevalence of infection in different age groups

The positive samples showed different intensities of the infection. Out of 86 positive samples 62(72.09%), 19(22.09%) and 05(05.81%) showed the unapparent, low grade and heavy infections respectively. The mean oocyst count for unapparent, low grade and heavy infections was 501.69±194.39, 1376.47±225.20 and 2909.4±546.29 respectively (Table 2).

Table 2. Intensity of infection in host birds

Intensity	No.(Percentage)	Mean OPG±SD
Unapparent	62 (72.09)	501.69±194.39
Low Grade	19 (22.09)	1376.47±225.20
Heavy	05 (05.81)	2909.4±546.29
Overall	86 (50.89)	834.94±672.01

The results of high prevalence in winter and low in summer agree with the findings of Oluyemi and Roberts, 1979; Shirley,1992; Halle, 1998; Alawa *et al*., 2001; and Ashenafi *et al*., 2004 who explained the effect of humidity percentage, which increases in winter on the coccidiosis incidence. In Kashmir, the winter has high humidity and also the high precipitation which favours the sporulation and survival of the oocysts in litter and increases the spread of oocysts in chicken farms (Jordan and Pattison, 1996). Moreover, Lunnden and Thebo (2000) and Badawy *et al*. (2000) also explained that the stocking density which increases in winter by 30% has a direct effect on the increasing incidence in winter. However our findings are not in consonance with those of Dar and Anwar (1981), Khan *et al*. (2006).
The results of this study reveal that all ages of poultry are susceptible to coccidiosis but younger birds are more susceptible to infection than older ones. The prevalence of infection increased with the age of the chickens up to 3-6 weeks which further declined in chickens exceeding 6 weeks in age. A possible reason for this may be that during the period between 3-6 weeks of age the birds have not attained immunity against coccidiosis, resulting in the increased incidence of the disease. This result is in agreement to the experiences of Long and Rowell (1975), McDougald and Reid (1991), Khan, *et al.* (2006), Nematollahi, *et al*. (2009) and is not in agreement with experiences (Chapman and Johnson, 1992; McDougald *et al*, 1997; Stayer *et al*., 1995).

Our findings of infection intensity are in close to reports given by Jatau *et al*., (2012) according to whom most of the infected chickens suffered unapparent infection and low grade infections and a lesser population showing severe infections in indigenous domestic chickens, broilers and layers. This is in agreement with the previous findings by Gual (1990) in Debre Zeit, 11% and 0%; Ashenafi (2000) in central Ethiopia, 15.79% and 4.21%; Getachew (2004) in Arsi zone 85.86% and 14.14% of sub clinical and clinical cases, respectively. The economic impact of subclinical infection is considerable and is main concern keeping commercial view in consideration as the subclinical form of disease shows negative effect on the performance of infected birds (Haug *et al*., 2008) and leads to impaired feed conversion which in turn causes great economic losses to poultry industry throughout the world.

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