

PREVALENCE PATTERN OF CATTLE COCCIDIOSIS IN MATHURA DISTRICT OF UTTAR PRADESH, INDIA

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SUMMARY

A two year (January 2018- December 2019) long prevalence study targeting cattle coccidiosis involved screening of 2469 faecal samples from different villages of Mathura district. Examination of faecal samples revealed an overall prevalence of 11.05%. Season-wise, the highest prevalence was recorded during monsoon (14.60%) followed by winters (11.94%), spring (11.91%) and summer (5.42%). The age wise maximum prevalence was reported in less than 6 months age (18.51%) followed by 6 months to 1 year (10.61%) and more than 1 year (3.93%) age group of cattle. Statistical analysis using chi square test indicated rate of infection significantly inversely proportional to the age of cattle. Species wise prevalence revealed that *E. zuernii* (40.83%) and *E. bovis* (22.91%) were the most prevalent species. This study indicates that monsoon, winter and spring are the best suitable season for the propagation of cattle coccidia. The adaptive measures are required for control of coccidiosis accordingly.

Keywords: Cattle coccidiosis, *E. bovis*, *E. zuernii*, Mathura, Prevalence

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Coccidiosis is a common gastrointestinal disease caused by protozoan parasites of the genus *Eimeria*. The major clinical signs of cattle coccidiosis are weight loss, retarded weight gain, diarrhoea, apathy, and inflammation of the affected organ (Tomczuk *et al.*, 2015). Clinical form of coccidiosis depends upon the factors like the number of oocysts ingested by the host, the species of *Eimeria*, concurrent infections, age, immune status of the host and management practices of the farm adopted for cattle rearing (Daugochies and Najdrowski 2005; Bangoura *et al.*, 2012; Das *et al.*, 2015). The clinical form of coccidiosis mainly reported in young animals, while adults are resistant due to immune response against the prior exposure with *Eimeria* (Taubert *et al.*, 2008). A total of 9 species of *Eimeria* have been reported from cattle (*E. subspherica*, *E. zuernii*, *E. alabamensis*, *E. elipsoidalis*, *E. cylindrica*, *E. bovis*, *E. condensens*, *E. bukidnonensis* and *E. auburnensis*) and among them *Eimeria zuernii* and *Eimeria bovis* are the most prevalent and pathogenic (Pandit, 2009). Mathura is district of Uttar Pradesh having 0.21 million cattle population and is well connected with state of Haryana and Rajasthan. The animal trade is very common in between these states. The prevalence data of cattle coccidiosis from this region is lacking from more than two decades. Keeping in view, the present investigation was focused on prevalence study of cattle coccidiosis from Mathura district of Uttar Pradesh, India.

The faecal samples were collected from twelve villages of Mathura district of Uttar Pradesh to assess the

seasonal dynamics of cattle coccidiosis. A total of 2469 faecal samples from different age groups of cattle were collected. Cattle were divided in three groups on the basis of age *viz.* less than 6 months, 6 months to 1 year and more than 1 year. Season and age wise prevalence pattern of the disease was studied by random sampling. The whole year was divided into four seasons *viz.* summer (April to June), monsoon (July to September), winter (October-January) and spring (February-March). The samples were collected in labelled clean polythene bags and transferred to the Postgraduate laboratory, Department of Parasitology, DUVASU, Mathura (Uttar Pradesh) in refrigerator at 4 °C for further processing. Samples were examined qualitatively and quantitatively by direct smear method and centrifugal floatation technique, modified McMaster's oocyst counting technique, respectively and micrometry. For speciation of coccidian oocysts, faeces were cultured in petri dishes containing 2.5% potassium dichromate solution. The species were identified by using the morphological characters including size, shape, colour and sporulation time, texture of oocyst wall, presence or absence of micropyle, polar cap with the aid of taxonomic keys (Pellerdy, 1965). Seasonal prevalence of coccidiosis was studied after sampling of target population during the study period (January 2018 to December 2019). Statistical analysis of data was done using Pearson Chi Square test to observe significant difference in prevalence between seasons.

The overall prevalence of coccidiosis in dairy cattle

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Table 1
Age wise and season wise prevalence of cattle coccidiosis

Seasons / Age	Summer (Apr-Jun)	Monsoon (Jul-Sept)	Winter (Oct-Jan)	Spring (Feb-Mar)	χ^2 value
< 6 Month	15/205 (7.31)	43/205 (20.97)	30/183 (16.39)	69/255 (27.05)	13.04*
6 M -1 Yr	11/182 (6.04)	34/215 (15.81)	25/140 (17.85)	13/245 (5.30)	
>1 Yr	06/203 (2.95)	15/210 (7.14)	7/196 (3.57)	05/230 (2.17)	

*Shows significant at (p> 0.05). Values in parentheses are percentage.

Table 2
Species wise prevalence of cattle coccidiosis among positive samples

Species	Summer	Monsoon	Winter	Spring	Total
<i>E. zuernii</i>	9/36 (25%)	24/62 (38.70%)	16/27 (59.25%)	49/115 (42.60%)	98/240 (40.83%)
<i>E. bovis</i>	6/36 (16.66%)	16/62 (25.80%)	6/27 (22.22%)	29/115 (25.21%)	57/240 (23.75%)
<i>E. brasiliensis</i>	3/36 (8.33%)	3/62 (4.83%)	1/27 (3.70%)	13/115 (11.30%)	20/240 (8.33%)
<i>E. subspherica</i>	4/36 (11.11%)	5/62 (8.06%)	1/27 (3.70%)	5/115 (4.34%)	15/240 (6.25%)
<i>E. bukidnonensis</i>	3/36 (8.33%)	3/62 (4.83%)	-	3/115 (2.60%)	9/240 (3.75%)
<i>E. auburnensis</i>	3/36 (8.33%)	5/62 (8.06%)	1/27 (3.70%)	6/115 (5.21%)	15/240 (6.25%)
<i>E. alabamensis</i>	3/36 (8.33%)	4/62 (6.45%)	2/27 (7.40%)	5/115 (4.34%)	14/240 (5.83%)
<i>E. ellipsoidalis</i>	2/36 (5.55%)	1/62 (1.61%)	-	3/115 (2.60%)	6/240 (2.5%)
<i>E. wyomingensis</i>	3/36 (8.33%)	1/62 (1.61%)	-	2/115 (1.73%)	6/240 (2.5%)

was 11.05%. There is no data available on prevalence study of bovine coccidiosis from Mathura region. Almost similar prevalence (11.97%) of bovine coccidiosis in dairy cattle was reported from Guwahati, Assam, India (Das *et al.*, 2015). Pregnancy and high lactation reduce the immunity of animal and make them more prone to infectious disease among adults. The season wise prevalence of cattle coccidiosis is presented in table 1. Briefly the highest season-wise prevalence was recorded during monsoon (14.60%) followed by winter (11.94%), spring (11.91%) and summer (5.42%). The previous studies reported variation in season wise prevalence rate (Priti *et al.*, 2008; Das *et al.*, 2015). The age wise maximum prevalence in present study was reported in the age group of less than 6 months age (18.51%) followed by 6 months to 1 year (10.61%) and more than 1 year (3.93%) age group of cattle (Table 1). Statistical analysis using chi square test indicated rate of infection significantly inversely proportional to the age of cattle (Table 1). Higher infection rate in young animals than adult was also reported by Priti *et al.* (2008) and discussed that immature immunity might be a critical factor for determining the clinical and subclinical infections in younger animals. The possibility of adult animals acting as a reservoir for younger ones in stall fed conditions is also an added explanation (Alemayehu *et al.*, 2013). The present study revealed that *E. zuernii* was the most prevalent species

(40.83%) followed by *E. bovis* (23.75%). The study is in agreement with the observations of Yu *et al.* (2011) and Heidari *et al.* (2014). *E. ellipsoidalis* and *E. wyomingensis* were the least prevalent species with prevalence rate of 2.5%. The detailed species wise prevalence is presented in table 2. Other species viz. *E. bukidnonensis*, *E. subspherica*, *E. auburnensis*, *E. alabamensis* and *E. ellipsoidalis* were also recorded in cattle with varying percentage from Pakistan (Nisar-Khan *et al.*, 2013), Brazil (Almeida *et al.*, 2011), India (Pandit, 2009), China (Dong *et al.*, 2012) and Poland (Pilarczy *et al.*, 2009). The variation in prevalence rate may be due to different geographical locations, host factors and climatic conditions required for the development of coccidian oocysts. There is requirement to observe the infection during monsoon and spring season as prevalence rate is highest in these seasons. Regular screening and therapeutic measures are required in these seasons for control of cattle coccidiosis.

REFERENCES

- Alemayehu, A., Mohammed, N. and Belina, T. (2013). Prevalence of bovine coccidia in Kombolcha district of South Wollo, Ethiopia. *J. Vet. Med. Anim. Health.* **5(2)**: 41-45.
- Almeida, V.D.A., Magalhaes, V.C.S., Muniz-Neta, E.S. and Munhoz, A.D. (2011). Frequency of species of the genus *Eimeria* in naturally infected cattle in Southern Bahia, Northeast Brazil. *Braz. J. Vet. Parasitol.* **20**: 78-81.
- Bangoura, B., Mundt, H.C., Schmäsche, R., Westphal, B. and Dausgchies, A. (2012). Prevalence of *Eimeria bovis* and *Eimeria zuernii* in

- German cattle herds and factors influencing oocyst excretion. *Parasitol. Res.* **110**: 875-881.
- Das, M., Deka D.K., Sarmah, P.C., Islam, S. and Sarma, S. (2015). Diversity of *Eimeria* spp. in dairy cattle of Guwahati, Assam, India. *Vet. World.* **8(8)**: 941-945.
- Dauguschies, A. and Najdrowki, M. (2005). Eimeriosis in cattle: current understanding. *J. Vet. Med. Ser. B.* **52**: 417-427.
- Dong, H., Zhao, Q., Han, H., Jiang, L., Zhu, S., Li, T., Kong, C. and Huang, B. (2012). Prevalence of coccidial infection in dairy cattle in Shanghai, China. *J. Parasitol.* **98**: 963-966.
- Heidari, H., Sadeghi, Z., Moayedil, R. and Gharekhani, J. (2014). Occurrence and diversity of *Eimeria* species in cattle in Hamedan province, Iran. *Veterinarni Medicina.* **59(6)**: 271-275.
- Nisar-Khan, M., Rehman, T., Sajid, M.S., Abbas, R.Z., Zaman, M.R., Sikandar, A. and Riaz, M. (2013). Determinants influencing prevalence of coccidiosis in Pakistani buffaloes. *Pak. Vet. J.* **33**: 287-290.
- Pandit, B.A. (2009). Prevalence of coccidiosis in cattle in Kashmir valley. *Vet. Scand.* **4(1)**: 33.
- Pellérdy, L.P. (1965). *Coccidia and Coccidiosis*. Hungary: Akadémiai Kiadó. p. 657.
- Pilarczy, B., Balicka-Ramisz, A., Kozak, W. and Ramisz, A. (2009). Occurrence of endoparasites in heifers imported to Poland from the Netherlands. *Arch. Tierzucht.* **52**: 265-271.
- Priti, M., Sinha, S.R.P., Sucheta, S., Verma, S.B., Sharma, S.K. and Mandal, K.G. (2008). Prevalence of bovine coccidiosis at Patna. *J. Vet. Parasitol.* **22**: 5-12.
- Taubert, A., Hermosilla, C., Suhwold, A. and Zahner, H. (2008). Antigen-induced cytokine production in lymphocytes of *Eimeria bovis* primary and challenge infected calves. *Vet. Immunol. Immunopathol.* **126**: 309-320.
- Tomczuk, K., Grzybek, M. and Szczepaniak, K. (2015). Analysis of intrinsic and extrinsic factors influencing the dynamics of bovine *Eimeria* spp. from central-eastern Poland. *Vet. Parasitol.* **214(1-2)**: 22-28.
- Yu, S.K., Gao, M., Huang, N., Jia, Y.Q. and Lin, Q. (2011). Prevalence of coccidial infection in cattle in Shanxi province, North Western China. *J. Anim. Vet. Adv.* **10(20)**: 2716-2719.