Cryptosporidium oocyst shedding in buffalo calves in Haryana: A case study

Krutanjali Swain, Abhilash Routray¹, Saraswat Sahoo² and Subha Ganguly³

Department of Veterinary Parasitology, Faculty of Veterinary Science and Animal Husbandry, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar 125004, Haryana, India.

Received: 28-08-2017 Accepted: 23-11-2017 DOI: 10.18805/ijar.B-3487

ABSTRACT

Bovine cryptosporidiosis primarily associated with neonatal diarrhea with higher morbidity than mortality in young calves till they attain immunological maturity. The present investigation relates to a report on the shedding of Cryptosporidium oocyst in two buffalo calves of buffalo farm, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar from 1st days up to 3 month of age at 15 days interval using simple conventional microscopy. By using formol-ether concentration technique followed by modified Ziehl-Neelsen (ZN) acid fast staining, Cryptosporidium oocysts were concentrated and identified. The Cryptosporidium oocysts appeared as reddish pink coloured bodies against a bluish/greenish coloured background at oil immersion using ZN staining kit. The maximum oocyst shedding was observed (2.3 oocyst / field) during 16 to 30 days of age. The oocyst shedding gradually decreased with increase in age afterwards clearly indicating the disease of young buffalo calves.

Key words: Buffalo calves, Conventional microscopy, Cryptosporidium spp, Oocyst shedding.

The genus Cryptosporidium was named at the beginning of this century by Ernest Edward Tyzzer (1907), but was only recognised as a potential cause of disease in 1955, when found to be associated with diarrhoeic turkeys (Slavin, 1955).

Cryptosporidium is known to occur in different species of hosts and today the parasite is known to infect more than 150 species of animals belonging to mammals, avian, reptiles, amphibian and fish (Fayer and Xiao, 2008). The protozoa primarily spread through the faeco-oral route, often through contaminated water which results in watery diarrhoea with or without an unexplained cough (Sponseller et al., 2014). In immuno-compromised individuals, the symptoms are particularly severe and can be fatal (Bhagat et al., 2017). Apart from causing economic losses to livestock industry, Cryptosporidium has also gained attention of scientific community as emerging zoonoses due to its public health significance (Sood et al., 2012, Desai et al., 2012).

Recent studies have revealed the heterogeneity of the Cryptosporidium spp, infecting both humans and animals, making the causal connection between animal and human cryptosporidiosis (Widmer, 1998). Worldwide, cattle are commonly infected with four Cryptosporidium species viz., C. parvum, C. andersoni, C. ryanae and C. bovis (Fayer et al., 2000, Venu et al., 2013). Further, all these four species have also been reported in buffaloes. Bovine cryptosporidiosis is primarily a patent infection in young calves till they attain immunological maturity which is invariably associated with neonatal diarrhoea with higher morbidity than mortality, thus resulting into weight loss and delayed or stunted growth reflecting substantial economic losses (Randhawa et al., 2012, Thakre et al., 2017). In India there are numerous reports on cryptosporidiosis largely based up on coprological and serological diagnosis and very few reports are available on molecular diagnosis (Nagamani et al., 2007, Bhat et al., 2012; Bhat et al., 2013, Singla et al., 2013). Owing to lack of information pertaining to occurrence of the disease in large ruminants of Haryana, the present investigation was undertaken to report the oocyst shedding in two buffalo calves from 1st days up to 3 month of age at 15 days interval to see the level of infection and infectivity using simple conventional microscopy.

Faecal sample collection: Fresh faecal samples were collected from two buffalo calves from 1st days to 3 month of age at 15 days interval from LUVAS buffalo farm, LUVAS, Hisar (Haryana). At the time of sample collection, each animal was clinically examined. The consistency of faeces, age, sex and breed were also recorded.

Each faecal sample was collected per-rectum separately in a clean, sterile polythene bag or vial using separate glove for each animal.

¹Corresponding author's e-mail: ganguly38@gmail.com
²Department of Veterinary Public Health and Epidemiology, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana - 125004, India.
³Department of Veterinary Microbiology, Arawali Veterinary College (Affiliated to Rajasthan University of Veterinary and Animal Sciences, Bikaner), N.H. – 52 Jaipur Road, V.P.O. Bajor, Sikar- 332 001, Rajasthan, India.
Concentration and identification of *Cryptosporidium* oocysts: For concentration and identification of *Cryptosporidium* oocysts, formol ether concentration technique was tried initially. The sediment of concentrate was stained with Ziehl-Neelsen (ZN) staining kit (Gupta and Singla 2012, Syakalima et al., 2015).

The faecal samples of the two female Murrah calves having bloody diarrhoea were collected for the study. The *Cryptosporidium* oocysts appeared as reddish pink coloured bodies against a bluish/greenish coloured background at oil immersion using Ziehl-Neelsen (ZN) staining kit.

Faecal samples of two calves (calf no. 0066 and calf no. 0067) from LUVAS buffalo farm, Hisar were positive for *Cryptosporidium* oocysts. Ten fields of ZN stained smear were examined and average of total oocysts recorded were calculated. The stained faecal smear showed an average 1.3 to 1.7 oocysts per field during the 1st fifteen day afterbirth (1 – 15 days). The oocyst output increase with maximum output during 16 to 30 days (2.3 oocyst per field) of age. The oocyst shedding gradually decreased with increase in age afterwards as depicted in Table 1 and Figure 1.

The results based on our preliminary data suggest that *Cryptosporidium* holds a major role in enteritis and diarrhoea in young buffalo calves.

**CONCLUSION**

On the basis of the present findings, it was concluded that cryptosporidiosis in buffaloes is a disease of young calves with maximum oocyst shedding during 16-30 days of age. The study confirms the second half of first month as most favourable age for dissemination of *Cryptosporidium* in environment and for susceptible animals. Further molecular biological study needs to be done to recognize the *Cryptosporidium* spp. specific to the buffalo calves in Haryana.

**REFERENCES**


