CASE REPORT

Diagnosis and Therapeutic Management of Cryptosporidiosis in a Young Diarrhoeic Calf

Saroj Kumar[1*], Shivani Kashaudhan[2], Pavan Kumar Yadav[3], Navin Chandra Pandey[4]

Ind J Vet Sci and Biotech (2026): 10.48165/ijvsbt.22.5.40

Cryptosporidium species are apicomplexan intracellular, extra-cytoplasmic protozoan parasites that infect the microvillus epithelium of the gastrointestinal tract causing cryptosporidiosis disease condition in wide range of vertebrate hosts including human beings (Xiao *et al.,* 2004). Cryptosporidiosis causes huge economic losses primarily due to morbidity with severe diarrhoea, dehydration and retarded growth, and limited extend to the mortality (O'Donoghue 1995). The pathogenic effect of bovine cryptosporidiosis caused by *Cryptosporidium parvum* is higher in young unweaned calves with an immature immune system, resulting in severe diarrhoea, dehydration and even death (Moore *et al.,* 2003; Trotz *et al.,* 2007); however, weaned and adult animals can also get infection with this species. Several reports of prevalence of *Cryptosporidium* spp. are available in neonatal and young bovine calves across the world, including India, leading to high morbidity and mortality along with their capacity to infect human being through the faeco-oral route of transmission (Fayer and Xiao, 2008; Venu *et al.,* 2012; Maurya *et al.* 2013a). In bovine cryptosporidiosis, the clinical form of the disease (Maurya *et al.,* 2016) and the oocyst shedding pattern in the faeces are restricted to calves of few months age only (Bhat *et al.,* 2012), but there are some reports of sub-clinical oocyst shedding in adults and immunocompromised animals (Lorenzo *et al.,* 1993).

Cryptosopridium species became a known and major public issue after a massive waterborne outbreak in Milwaukee, USA in 1993 (MacKenzie *et al.,* 1994). Now a days *Cryptosporidium* spp. has been recognized beyond the livestock/veterinary problem; it is considered as a vital zoonotic waterborne parasite transmitted from cattle to immunocompromised humans (Fayer *et al.,* 2000; Slifko *et al.,* 2000). Cryptosporidiosis in animals poses a significant threat to public health, as the massive shedding of resistant oocysts can easily contaminate the water sources (Maurya *et al.,* 2013a). Furthermore, the clinical disease adversely impacts the animal productivity and often causing high morbidity and mortality in calves (Singh *et al.,* 2006; Maurya *et al.,* 2016). In the present document we report the diagnosis and therapeutic management of cryptosporidiosis in young diarrhoeic calf.

[1]Department of Veterinary Parasitology, Faculty of Veterinary and Animal Sciences, Institute of Agricultural Sciences, Rajiv Gandhi South Campus, Banaras Hindu University, Mirzapur-231001, Uttar Pradesh, India

[2]Department of Genetics and Plant Breeding, Institute of Agricultural Sciences, Rajiv Gandhi South Campus, Banaras Hindu University, Mirzapur-231001, Uttar Pradesh, India

[3]Department of Veterinary Physiology & Biochemistry, Faculty of Veterinary and Animal Sciences, Institute of Agricultural Sciences, Rajiv Gandhi South Campus, Banaras Hindu University, Mirzapur-231001, Uttar Pradesh, India

[4]Veterinary Medical Officer, Govt. Veterinary Hospital, Chilh, Mirzapur-231001, Uttar Pradesh, India

Corresponding Author: Saroj Kumar, Department of Veterinary Parasitology, Faculty of Veterinary and Animal Sciences, Institute of Agricultural Sciences, Rajiv Gandhi South Campus, Banaras Hindu University, Mirzapur-231001, Uttar Pradesh, India. E-mail: saroj.kumar@bhu.ac.in

How to cite this article: Kumar, S., Kashaudhan, S., Yadav, P. K., & Pandey, N. C. (2026). Diagnosis and Therapeutic Management of Cryptosporidiosis in a Young Diarrhoeic Calf. Ind J Vet Sci and Biotech, 22(5), 195-197.

Source of support: Nil

Conflict of interest: None

Submitted 02/07/2026 **Accepted** 20/07/2026 **Published** 10/09/2026

Case History and Observations

A 20-day-old cattle calf was presented to the Veterinary Hospital, Chilh, Mirzapur (U.P., India) with the history of severe watery diarrhoea with mucous and blood tinge for last 4-5 days. On physio-clinical examination, the calf was found severely dehydrated, dull, weak, emaciated and showing the symptoms of straining and diarrhoea with normal body temperature and respiration rate. The physical appearance of diarrhoeic faeces was slightly yellow to pale in colour and mixed with blood tinged mucous and having foul smell. Faecal sample was collected directly from rectum in a sterile sample collection vial and was brought to the Department of Veterinary Parasitology, Faculty of Veterinary and Animal Sciences, RGSC-BHU, Barkachha for parasitological

© The Author(s). 2026 Open Access This work is licensed under a Creative Commons Attribution-Non Commercial-No Derivatives 4.0 International License.

examination to check the presence of parasitic stages (eggs, cysts or oocysts).

The faecal smears were prepared on clean grease free microscopic glass slides for direct wet smear examination and for modified Ziehl-Neelsen (mZN) staining for confirmation of *Cryptosporidium* spp. oocysts (Henriksen and Pohlenz, 1981). The parasitological examination of direct wet smear revealed the presence of ciliates cysts and oocysts of *cryptosporidium* spp. which were rounded, approx. a size of erythrocytes (4-7 mm) with sporozoites, giving the appearance of brightening spots upon the focusing and out of focusing (Fig. 1). The presence of *Cryptosporidium* spp. oocysts was further confirmed by the staining of faecal smears by mZN staining technique, which revealed the presence of bright pinkish red coloured *Cryptosporidium* spp. oocysts with a hollow, light passing area at centre (Fig. 2). Based on the findings the presented calf was confirmed positive for *Cryptosporidium* oocysts and ciliates cysts.

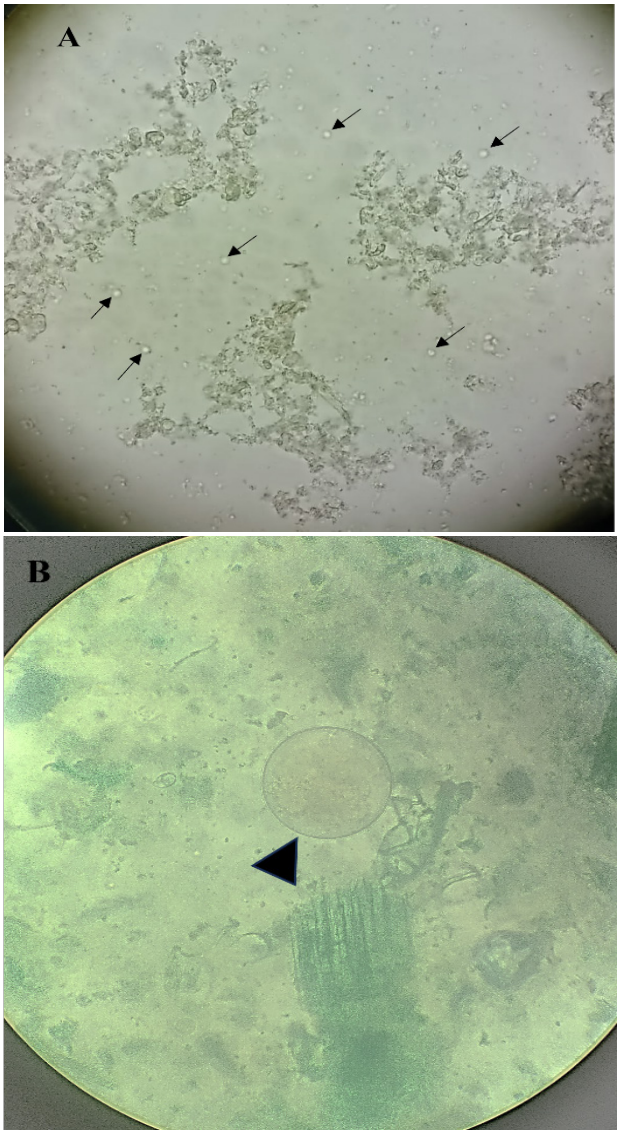


Fig 1: Direct faecal examination shows (A) unstained *Cryptosporidium* spp. oocysts (arrows) and (B) Cysts of ciliates (arrow head) at x 40

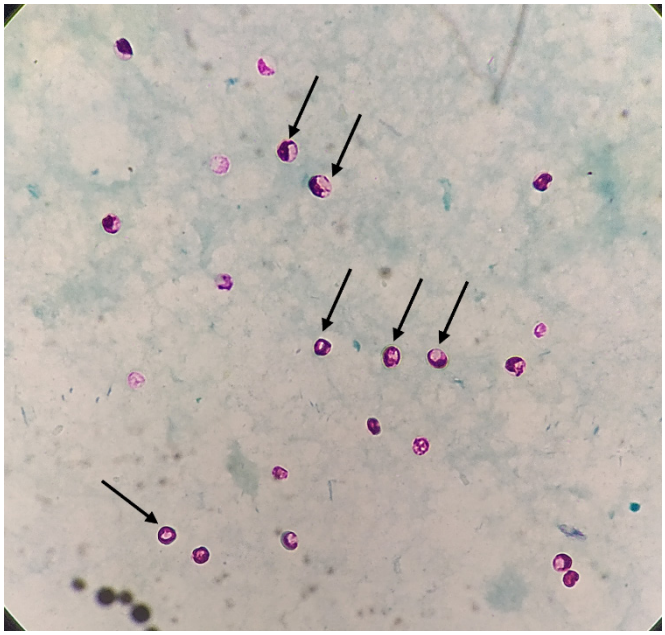


Fig 2: Bright pinkish red coloured *Cryptosporidium* spp. oocysts (arrows) seen in modified Ziehl-Neelsen (mZN) stained faceal smear examination at high magnification (x 100)

Treatment and Discussion

The affected calf was treated with combination of metronidazole (1000 mg/calf/day) and azithromycin (1500 mg/calf/day) orally for 5 days along with supportive oral ORS supplement therapy for quick recovery. The calf responded well to the administered therapy. The diarrhoeal symptoms subsided from 3rd days of treatment and the calf showed the marked clinical improvement and became normal healthy in condition by 7th day post-treatment. Furthermore, after 7th day of treatment, the faecal examination test for presence of cysts and *Cryptosporidium* oocysts was negative, indicating the therapy worked effectively.

The causative agent for bovine neonatal diarrhoea includes variety of pathogens such as rota virus or corona virus or *Salmonella* or *E. coli* or *Cryptosporidium* or ciliates but various studies shows that the *Cryptosporidium* spp. act as primary pathogen for neonatal diarrhoea (Izzo *et al.,* 2011; Cho and Yoon, 2014; Conrady *et al.,* 2021). *Crypatosporidium* species is very common in livestock and act as a zoonotic importance pathogen in humans, particularly in young children and immunocompromised adults; causing significant morbidity and mortality (Maurya *et al.,* 2013b; Conrady *et al.,* 2021). The disease condition is characterized by acute gastrointestinal disturbances, mucoid to haemorrhagic diarrhoea, fever, anorexia, lethargy and loss of condition, leading to significant economic losses in livestock and human beings (Xiao *et al.,* 1999). There are various reports of cryptosporidiosis in the young calves with diarrhoeic symptoms; significantly higher in young calves below 1 months of age (Bhat *et al.,* 2012; Randhawa *et al.,* 2012; Maurya *et al.,* 2013a).

In present study, we reported the successful management of diarrhoea in young calves with mixed infection of ciliates and *Cryptosporidium* spp., by using the combination therapy of metronidazole and azithromycin orally for 5 days along with oral supportive therapy for quick recovery. The findings of present study were in accordance with various previous reposts (Elitok *et al.* 2005; Randhawa et al. 2012; Nasir *et al.,* 2013; Maurya *et al.,* 2016; Ganai *et al.,* 2017).

In summary, since the clinical signs of neonatal diarrhoea are often nonspecific and do not allow us to differentiate among the various causative agents, prompt specific laboratory diagnosis is essential for accurate diagnosis of pathogens and the implementation of appropriate specific treatment therapy. Therefore, it is inferred that the modified ZN staining of faecal smear is confirmatory diagnosis for cryptosporidium oocyst and the combination of metronidazole and azithromycin for 5 days along with supportive therapy is very effective for control of diarrhoea in young calf positive for ciliates and cryptosporidium infections.

Acknowledgments

The authors are thankful to the Dean, Faculty of Veterinary and Animal Sciences for providing the necessary facilities. The work was financially supported by Institution of Eminence (IoE)-Seed Grant, Banaras Hindu University, Varanasi, is also duly acknowledged.

References

Bhat, S.A., Juyal, P.D., & Singla, L.D. (2012). Prevalence of cryptosporidiosis in neonatal buffalo calves in Ludhiana district of Punjab, India. *Asian Journal of Animal & Veterinary Advances, 7,* 512-520.

Cho, Y.I., & Yoon, K.J. (2014). An overview of calf diarrhoea - Infectious etiology, diagnosis, and intervention. *Journal of Veterinary Science, 15*(1), 1-17.

Conrady, B., Brunauer, M., & Roch, F.F. (2021). *Cryptosporidium* spp. infections in combination with other enteric pathogens in the global calf population. *Animals, 11*(6), 1787.

Elitok, B.O., Elitok, M., & Pulat, H. (2005). Efficacy of azithromycin dihydrate in treatment of cryptosporidiosis in naturally infected dairy calves. *Journal of Veterinary Internal Medicine, 19,* 590-593.

Fayer, R., Morgan, U., & Upton, S.J. (2000). Epidemiology of *Cryptosporidium*: transmission, detection and identification. *International Journal of Parasitology, 30,* 1305-1322.

Fayer, R., & Xiao, L. (2008). *Cryptosporidium and Cryptosporidiosis.* 2nd edn., CRC, Boca Raton.

Ganai, A., Yadav, A., Katoch, R., Godara, R., Sood, S., Rastogi, A., Saleem, T., & Khursheed, A. (2017). Efficacy of azithromycin in treatment of Cryptosporidiosis in naturally infected cattle calves. *Haryana Veterinarian, 56*(2), 229-231.

Henriksen, A., & Pohlenz, J.F.L. (1981). Staining of cryptosporidia by a modified Zeihl-Neelson technique. *Acta Veterinarsca Scandinavia, 22,* 594-596.

Izzo, M.M., Kirkland, P.D., Mohler, V.L., Perkins, N.R., Gunn, A.A., & House, J.K. (2011). Prevalence of major enteric pathogens in Australian dairy calves with diarrhoea. *Australian Veterinary Journal, 89*(5), 167-73.

Lorenzo, L.M.J., Ares-Maza´s, E., & Villacorta, M.I. (1993). Detection of oocysts and IgG antibodies to *Cryptosporidium parvum* in asymptomatic adult cattle. *Veterinary Parasitology, 47,* 9-15.

MacKenzie, W.R., Hoxie, N.J., Proctor, M.E., Gradus, M.S., Blair, K.A., Peterson, D.E., Kazmierczak, J.J., Addiss, D.G., Fox, K.R., Rose, J.B., & Davis, J.P. (1994). A massive outbreak in Milwaukee of *Cryptosporidium* infection transmitted through the public water supply. *The New England Journal of Medicine, 331,* 161-167.

Maurya, P.S., Garg, R., Banerjee, P.S., Kumar, S., Rakesh, R.L., Kundu, K., Ram, H., & Raina, O.K. (2013b). Genotyping of *Cryptosporidium* spp. reveals prevalence of zoonotic *C. parvum* subtype in bovine calves of north India. *Indian Journal of Animal Sciences, 83*(10), 1018-23.

Maurya, P.S., Rakesh, R.L., Pradeep, B., Kumar, S., Kundu, K., Garg, R., Ram, H., Kumar, A., & Banerjee, P.S. (2013a). Prevalence and risk factors associated with *Cryptosporidium* spp. infection in young domestic livestock in India. *Tropical Animal Health & Production, 45*(4), 941-446.

Maurya, P.S., Sahu, S., Sudhakar, N.R., Jaiswal, V., Prashant, D.G., Rawat, S., & Verma, H. (2016). Cryptosporidiosis in a buffalo calf at Meerut, Uttar Pradesh and its successful therapeutic management. *Journal of Parasitic Diseases, 40*(4), 1583-85.

Moore, D.A., Atwill, R.E., Kirk, J.H., Brahmbhatt, D., Herrera, L., Alonso, L.H., Singer, M.D., & Miller, T.D. (2003). Prophylactic use of decoquinate for infections with *Cryptosporidium parvum* in experimentally challenged neonatal calves. *Journal of the American Veterinary Medical Association, 223,* 839-845.

Nasir, A., Avais, M., Khan, M.S., Khan, J.A., Hameed, S., & Reichel, M.P. (2013). Treating *Cryptosporidium parvum* infection in calves. *Journal of Parasitology, 99*(4), 715-717.

O'Donoghue, P.J. (1995). *Cryptosporidium* and cryptosporidiosis in man and animals. *International Journal of Parasitology, 25,* 139-195.

Randhawa, S.S., Randhawa, S.S., Zahid, U.N., Singla, L.D., & Juyal, P.D. (2012). Drug combination therapy in control of cryptosporidiosis in Ludhiana district of Punjab. *Journal of Parasitic Diseases, 36*(2), 269-272.

Singh, B.B., Sharma, R., Kumar, H., Banga, H.S., Aulakh, R.S., Gill, J.P.S., & Sharma, J.K. (2006). Prevalence of *Cryptosporidium parvum* infection in Punjab (India) and its association with diarrhoea in neonatal dairy calves. *Veterinary Parasitology, 140,* 162-165.

Slifko, T.R., Smith, H.V., & Rose, J.B. (2000). Emerging parasite zoonoses associated with water and food. *International Journal of Parasitology, 30*, 1379-1393.

Trotz, W.L.A., Martin, S.W., Leslie, K.E., Duffield, T., Nydam, D.V., & Peregrine, A.S. (2007). Calf-level risk factors for neonatal diarrhoea and shedding of *Cryptosporidium parvum* in Ontario dairy calves. *Preventive Veterinary Medicine, 82,* 12-28.

Venu, R., Latha, B.R., Basith, S.A., Raj, G.D., Sreekumar, C., & Raman, M. (2012). Molecular prevalence of *Cryptosporidium* spp. in dairy calves in southern states of India. *Veterinary Parasitology, 188,* 19-24.

Xiao, L., Escalante, L., Yang, C., Sulaiman, I., Escalante, A.A., Monsali, R.J., Fayer, R., & Lal, A.A. (1999). Phylogenetic analysis of *Cryptosporidium* parasites based on the small subunit rRNA gene locus. *Applied Environmental Microbiology, 65,* 1578-1583.

Xiao, L., Fayer, R., Ryan, U., & Upton, S.J. (2004). Cryptosporidium taxonomy: Recent advances and implications for public health. *Clinical Microbiology Reviews, 17,* 72-97.