International Journal of Livestock Research, Vol. 14 (12) Dec' 2024
http://www.ijlr.org
eISSN: 2277-1964
NAAS Score:4.31

Case Report

Clinical Investigation and Therapeutic Management of Buxtonellosis in Buffalo

Tarun Kumar[1], M. V. Jithin[2], Desh Deepak[3*], Arbind Singh[4] and Amit Kumar Verma[5]

[1]MVSc Scholar, Department of Veterinary Medicine, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, Uttar Pradesh, INDIA
[2]Assistant Professor, Department of Veterinary Medicine, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, Uttar Pradesh, INDIA
[3]Assistant Professor, Department of Veterinary Medicine, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, Uttar Pradesh, INDIA
[4]Assistant Professor, Department of Livestock Farm Complex-Veterinary Medicine, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, Uttar Pradesh, INDIA
[5]Professor & Head, Department of Veterinary Medicine, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, Uttar Pradesh, INDIA

*Corresponding Author: deshdeepak396@gmail.com

How to cite this paper
Kumar, T., Jithin, M. V., Deshdeepak, Singh, A., & Verma, A. K. (2024). Clinical Investigation and Therapeutic Management of Buxtonellosis in Buffalo. *International Journal of Livestock Research*, 14 (12), 45-49.

Received : Nov 11, 2024
Accepted : Dec 10, 2024
Published : Dec 31, 2024

Abstract

A 6-year-old female buffalo from the Livestock Farm Complex of Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut presented with a complaint of offensive-odour diarrhoea, progressive debility, significant weight loss over the last 6-7 days. Clinical examination revealed greenish watery faeces with some mixed mucus. The buffalo appeared dull and depressed with a rough and muddy body coat and a partial loss of appetite. A faecal examination confirmed the case of Buxtonella sulcata infection. Buffalo was efficiently and safely treated by using intravenous administration of oxytetracycline @ 5-10 mg/kg body weight for seven days. Supportive therapy included fluid therapy and anti-inflammatory and anti-histaminic drugs. The buffalo tolerated the medication well, and no significant alterations were observed in the haemato-biochemical profile during or after the recovery period.

Keywords: *Buxtonella sulcata*, Buxtonellosis, Diarrhoea, Oxytetracycline.

Introduction

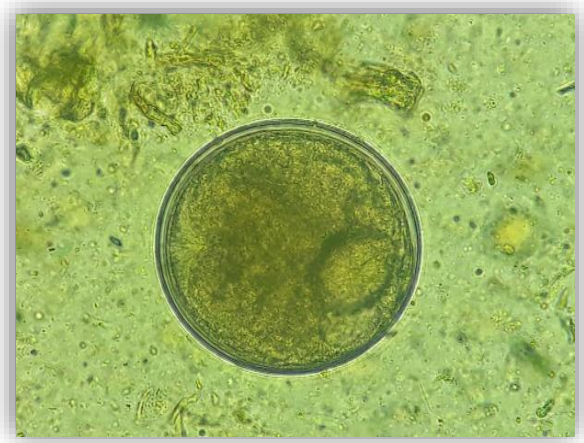
Parasitic diarrheal disease is a major cause of morbidity and mortality in bovines and neonates. *Toxocara vitulorum*, *Eimeria* spp., *Giardia* spp., *Cryptosporidium* spp., and *Buxtonella sulcata* are the common intestinal protozoan responsible for causing diarrhoea and even death in neonates and adult bovines (Tomczuk *et al*., 2005). Among these protozoan *Buxtonella sulcata* is an opportunistic ciliate protozoan that lives in the colon of bovines and is a probable causes of diarrhoea in bovines of unknown aetiology (Levine 1985; Bhatia 2000). Buxtonella is normal inhabitant of gastrointestinal tract of ruminants and shares morphological similarities with *Balantidium coli* (Jameson, 1926). Bovine Buxtonellosis arises as a result of the pathological proliferation of the protozoan in the colon due to exposure to stressors (Kumar *et al*., 2017). Clinically the disease is characterised by debilitating diarrhoea that can becomes severe and life-threatening in untreated animals(Fox and Jacops 1984; Goz *et al*., 2006; Al-Zubaidi and Al-Mayah 2011). In untreated animals, disease course is usually chronic recurrent or long-lasting. The present study reports the successful diagnosis and management of buxtonellosis in buffalo.

Case History and Observations

A 6-year-old female buffalo from the Livestock farm complex of Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut presented with a complaint of diarrhoea with an offensive-odour for the last 6-7 days. The buffalo showed progressive debility and significant weight loss. It appeared dull and depressed with a rough and muddy body coat and had also shown a partial loss of appetite (Fig. 1). Gross faecal examination revealed greenish watery faeces mixed with mucus (Fig. 2). A faecal sample was collected for laboratory examination.

Fig. 1: Female buffalo at Livestock farm complex

Fig. 2: Faces of the affected buffalo



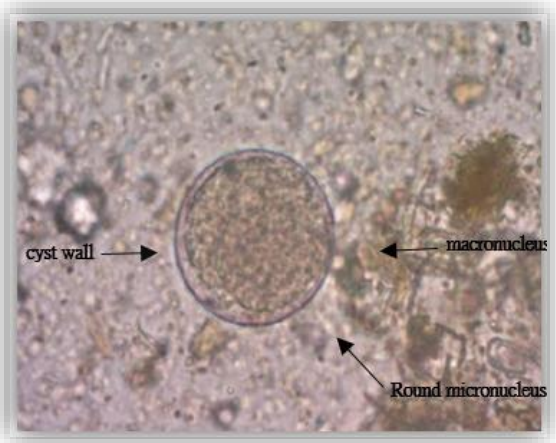


Fig 3 & 4: Microscopic field showing cyst of *Buxtonella sulcata* (with a clear wall, kidney-shaped macronucleus and round micronucleus) under 40X

Laboratory Examination

Diagnostic procedures included fecal examination. A faecal examination was conducted to identify the presence of cysts or trophozoites of *Buxtonella sulcata*. The confirmatory diagnosis was made based on the microscopic faecal examination under 40X magnification. The microscopic examination showed a cyst with a clear wall, kidney-shaped macronucleus and round micronucleus, as well as a ciliated trophozoite with two openings in the posterior end of *Buxtonella sulcata* (Fig. 3 & Fig. 4).

The values of physiological, haematological and biochemical parameters of buffalo before and after treatment are given below (Table 1).

S.N.	Parameter	Before treatment	After treatment	Reference Range
1.	Rectal Temperature (ºF)	100.9	101.6	101-102
2.	Respiration rate/minute	29	16	12-16
3.	Heart rate/minute	71	55	40-60
4.	Haemoglobin (g/dl)	11.7	12.1	8.5-15
5.	Red Blood Cell count ($\times 10^6$/µL)	8.8	9.1	5-10
6.	White blood cells ($\times 10^3$/µL)	11627	10561	4000-12000
7.	Packed cell volume (Haematocrit) (%)	46.7	41.3	24-46
8.	Neutrophils (%)	21	27	15-33
9.	Lymphocytes%)	58	62	45-75
10.	Monocytes (%)	4	3	0-8
11.	Eosinophils (%)	17	8	0-20
12.	AST	107	102	60-125
13.	BUN	19	17	10-25
14.	Creatinine	1.2	1.1	0.5-2.2

#Latimer KS, Duncan & Prasse's Veterinary Laboratory Medicine*: Clinical Pathology*, 5th ed., Wiley-Blackwell, 2011.

Result and Discussion

The buffalo was successfully and safely managed using intravenous administration of Inj. oxytetracycline (Steclin, Cadila Healthcare Ltd.) @ 10 mg/kg body weight once daily intravenously for seven consecutive days along with supportive treatment involving intravenous fluid therapy using Ringer lactate solution @ 10 ml/kg body weight once daily intravenously for 3 days. Additionally, Inj. Flunixin meglumine (Finadyne, MSD animal health pvt. Ltd.) was administered @ 2.2 mg/kg body weight once daily intramuscularly, and Inj. Chlorpheniramine maleate (Anistamin, Intas Pharmaceuticals, Ahmedabad, Gujarat) @ 0.5 mg /kg body weight once daily intramuscularly for six consecutive days.

Fig 5: Faeces: After-treatment

Fig 6: Buffalo: After-treatment

The buffalo that were affected showed improvement the day after treatment. The faecal samples were examined again on the 7th and 15th day after treatment, and they tested negative for *Buxtonella sulcata* cysts and trophozoites.

Buxtonella sulcata (14.57%) is one of the most common gastrointestinal protozoa in bovines and is found in all age categories, seasons, sexes, and breeds (Maharana *et al*., 2016). Previously considered non-pathogenic recent research has linked *Buxtonella sulcata* to diarrhoea, a finding supported by the current investigation (Al-Saffar *et al*., 2010 and Maharana *et al*., 2016). Extreme environmental stress and poor hygiene of premises have been identified as precursors to *Buxtonella sulcata* infection in earlier studies (Hasheminasab *et al*. 2015) and (Maharana *et al*., 2016). The diagnosis of Buxtonella sulcata was confirmed by the presence of a cyst with a clear wall, a kidney-shaped macronucleus, a round micronucleus, and a ciliated trophozoite featuring two openings at the posterior end (Bhoi *et al.*, 2021). Affected buffalo were successfully treated with parenteral medicinal therapy using fluids, Inj. Oxytetracycline (5-10 mg/kg body weight), Inj. Flunixin Meglumine (2.2 mg/kg body weight) and Inj. chlorpheniramine maleate (0.5 mg /kg body weight) (Bhoi *et al.*, 2021 and Deepak *et al.*, 2020). Inj. Oxytetracycline a broad-spectrum antibacterial and antiprotozoal drug is effective against *Buxtonella sulcata* (Hasheminasab *et al*., 2015). The recovery of the case with Inj. Oxytetracycline administration aligns with previous reports (Bhoi *et al*., 2021). Haematological and biochemical parameters exhibited slight variations prior to treatment; however, following treatment, these parameters returned to normal levels. Consequently, no significant changes attributable to the *Buxtonella sulcata* infection were observed. Infection with *Buxtonella sulcata* typically results in mild health issues, especially in young ruminants, but it can also significantly impact on growth and productivity, leading to substantial financial losses for farmers. Therefore, regular and scheduled herd screening using microscopic faecal inspection is recommended in areas where *Buxtonella sulcata* infections are common.

Conclusion

No adverse effects were noticed in behaviour and haemato--biochemical findings during the Oxytetracycline therapy. From the findings of the present study, it is concluded that oxytetracycline is well tolerated by Buffalo and is effective and safe therapeutic strategy for Buxtonellosis.

Acknowledgements

The authors are thankful to the Hon'ble Vice Chancellor, SVPUAT, Meerut for providing the diagnostics and laboratory facilities necessary in the case study.

Contribution by Authors

Each co-author contributes equally.

Conflict of Interests

There is no conflict of interest.

Publisher Disclaimer

IJLR remains neutral concerning jurisdictional claims in published institutional affiliation.

References

1. Al-Saffar, T.M., Suliman, E.G. & Al-Bakri, H.S. (2010). Prevalence of intestinal ciliate *Buxtonella sulcata* in cattle in Mosul. *Iraqi Journal of Veterinary Sciences*, 24 (1): 27-30.
2. Al-Zubaidi, M.T. & Al-Mayah, K.S. (2011) Prevalence of *Buxtonella sulcata* in neonatal and young calves in Al-Nasir station and some regions in Baghdad (Al-Shuala and Gazaliya). *Iraqi J Sci*, 52(4): 420–424.
3. Bhatia, B.B. (2000). Textbook of veterinary protozoology, 1st edn. Indian Council of Agricultural Research, Pusa, pp: 336–337.
4. Bhoi, D.B., Raval, J.K., Pandya, G.M. & Katariya, M. A. (2021). Therapeutic management of *Buxtonella sulcata* infection in Surti buffalo Calves. *Journal of Livestock Science (ISSN online 2277-6214), 12*: 276-278.

5. Fox, M.T. & Jacops, D.E. (1984). Patterns of infection with *Buxtonella sulcata* in British cattle. *Res Vet Sci*, 41: 135–138.
6. Goz, Y., Altug, N., Yuksek, N. & Ozkan, C. (2006). Parasite detected in neonatal and young calves with diarrhoea. *Bull Vet Inst Pulawy*, 5: 345–348.
7. Hasheminasab, S.S., Darbandi, M.S., Talvar, H.M., Maghsood, H. & Khalili, S. (2015). Chemotherapy of *Buxtonella sulcata* in cattle in Sanandj, Iran. *International Journal of Medicine*, 3 (2): 118-119.
8. Jameson, P.A. (1926). A ciliate, *Buxtonella sulcata*, from the caecum of the cattle. *Parasitology*, 18 (2): 182-186.
9. Kumar, B., Maharana, B.R., Prashad, A., Joseph, J.P. & Patel, B.R. (2017). Incidence of *Buxtonella sulcata* in Jaffrabadi buffaloes of south-western Gujarat, India. *Buffalo Bulletin*, 36 (4): 623-628.
10. Latimer, K. S. (Ed.). (2011). Duncan and Prasse's veterinary laboratory medicine. *clinical pathology*. John Wiley & Sons.
11. Levine, N.D. (1985). Veterinary Protozoology. Lowa State University, Ames, IA, p 414.
12. Maharana, B.R., Kumar, B., Sudhakar, N.R., Behera, S.K. & Patbandha, T.K. (2016). Prevalence of gastrointestinal parasites in bovines in and around Junagadh (Gujarat). *Journal of Parasitological Diseases*, 40 (4): 1174-1178.

****