

CLINICAL OBSERVATIONS WITH THERAPEUTIC MANAGEMENT OF PARASITIC BOTTLE JAW SYNDROME IN CALVES

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ABSTRACT

This study was conducted to study the etiology, clinical findings and therapeutic management of bottle jaw affected calves, which were brought for treatment at the Bangladesh Agricultural University (BAU) Veterinary Clinic during the period from July to December 2002. During this period, a total of 15 bottle jaw affected calves of either sex and aged between 6 to 12 months were selected and utilized for this study. Parasitological examination of the faeces samples of each of the 15 calves showed significantly higher incidence of mixed (80%) than single type of gastrointestinal helminth infection. Of the 15 calves examined, of which 13 (86.67%) calves were affected with *Fasciola gigantica*, 10 (66.67%) with *Paramphistomum* sp. and 7 (46.67%) calves with gastrointestinal nematodes. The highest infection rate was found with *Fasciola gigantica* and lowest with gastro-intestinal nematodes. History and clinical examination of these calves revealed malnutrition and the clinical signs recorded were normal rectal temperature, pulse and respiratory rate, loss of appetite (66.67%), rough hair coat (80.00%), pale conjunctival mucosa (86.67%), dehydration (100%), loss of body condition (100%), weakness (80%), dullness (46.67%), depression (60%), pot-belly (40%) and diarrhoea (86.67%). The Tetranid[®] (tetramisole plus oxcyclozanide) was found to be highly effective against both the flukes and gastrointestinal nematodes. Fenbendazole (Peraclear[®], Techno Drugs) was highly effective against gastrointestinal nematodes which were associated with bottle jaw in calves. Treatment with anthelmintics followed by hematinic drugs resulted 100% recovery of parasitic bottle jaw cases in calves within 28th day of treatment. Therefore, bottle jaw syndrome in calves, caused by gastro-intestinal helminths, could be successfully treated with anthelmintics with supportive treatment with any effective haematinic drugs.

Key words: Parasitic bottle jaw syndrome, calves, clinical observations, therapeutic management

INTRODUCTION

Calves under rural conditions in Bangladesh are usually maintained just to induce letting down of milk in cows. As a result most of the calves maintained under traditional management system start eating grass at their early life, which invariably expose to early infection. Debnath *et al.* (1990) reported that 50% calves up to one year of age died due to gastro-intestinal disturbances and argued that malnutrition to be the probable major cause of calf mortality on smallholder traditional farms in Bangladesh. Gastro-intestinal parasites have been recognized to be associated with poor growth rate digestive disorders, ill-health and mortality, and most of the earlier reports on calf diseases in Bangladesh have been confined on general morbidity and mortality rate based on hospital and farm records, sub-clinical parasitic infection and necropsy examination of dead calves, which is reviewed by Samad (2000a). Recently it has been reported that 82.62% clinically sick calves up to 12 months of age affected with various gastro-intestinal parasitic infection (Samad, 2001a).

Accumulation of non-inflammatory fluid in the inter-mandibular space (dewlap) is commonly known as bottle jaw that has been recorded in 2.27% cattle of all age groups and 3.48% in calves up to one year old (Samad, 2001b). Although the bottle jaw syndrome associated with hypo-proteinaemia (malnutrition) is frequently encountered in ruminant practices in Bangladesh but published reports on this clinical problem is lacking in inland literature (Samad, 2000a). Considering the mentioned facts, the present study was undertaken to determine the parasitic etiology and clinical findings and to evaluate the anthelmintic efficacy against parasitic bottle jaw in calves.

MATERIALS AND METHODS

This study on bottle jaw syndrome was carried out on randomly selected 15 clinically sick cross breed calves, aged between 6 to 12 months of either sex, which were brought for treatment at the (BAU) Veterinary Clinic, Mymensingh during the period from July to December 2002. Clinical history obtained from the owner revealed that all selected calves had swollen chin with day-by-day examination and gastrointestinal disturbances.

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The description of each of the randomly selected 15 calves was recorded to assess their influence on the occurrence of the disease. Each of the 15 bottle jaw affected calves was thoroughly examined by using different clinical examination techniques described by Radostits *et al.* (2000) and Samad (2001c). Rectal temperature was recorded by the help of clinical thermometer by introducing into the rectum. Detail clinical findings were recorded from each of the selected 15 calves. The following features were recorded from the affected calves through proper clinical examination such as rectal temperature, pulse rate, respiratory rate, and changes of appetite, body condition, dehydration, hair coat, conjunctival mucosa, dullness, depression, weakness, faeces consistency, abdominal size and edematous swelling in the inter-mandibular space.

Faeces samples of each of 15 calves were collected directly from the rectum in separate plastic vial and brought to the laboratory of the Department of Medicine, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh for the parasitological examination. Each of the collected faeces samples was examined immediately after collection on conventional direct smear method and followed by quantitative Stoll's dilution technique for helminth eggs as described by Samad (2001c). The parasites like *Fasciola* sp., *Paramphistomum* sp. and other gastrointestinal nematodes were diagnosed on the basis of morphological characteristics of their eggs as described by Soulsby (1982) and Samad (2001c).

According to types of parasites found, the calves were divided into three groups, namely A (flukes), B (flukes plus gastrointestinal nematodes) and C (gastrointestinal nematodes). Potentiated anthelmintic, Tetranid[®] (Techno Drugs), each bolus contains 2.0 g Tetramisole hydrochloride and 1.4 g Oxyceozanide, which has been used in this study to treat the calves of groups A and B, whereas the calves of group C were treated with fenbendazole (Peraclear[®], Techno Drugs). Each of the calf of all the three groups A, B and C was treated with hematinic IM injection, Hematopan B₁₂[®] (Advance Animal Science Co. Ltd.), Bional forte (Techno Drugs) and Bivinal forte (Novartis Bangladesh Ltd), respectively.

Results were analyzed statistically with the help of Student's 't' test for significance as described by Gupta (1982).

RESULTS AND DISCUSSION

Etiology of bottle jaw syndrome in calves

History and clinical examination showed that inanition (malnutrition) with hypoproteinaemia were associated with the bottle jaw syndrome in calves. Parasitological examinations of faecal samples showed that all the 15 calves were affected with either single or mixed infection with *Fasciola* sp., *Paramphistomum* sp. and gastro-intestinal nematodes (GIN) parasites (Table 1).

Table 1. Status of parasitic infection in calves affected with bottle jaw syndrome

S/N	Helminth parasites	Affected cases	
		No.	%
1.	<i>Fasciola gigantica</i>	02	13.33
2.	Gastro-intestinal nematodes (GIN)	01	06.67
	Sub-total (Single infection)	03	20.00
3.	<i>Fasciola gigantica</i> + <i>Paramphistomum</i> sp.	06	40.00
4.	<i>Fasciola gigantica</i> + G.I. nematodes	02	13.33
5.	G.I. nematodes + <i>Paramphistomum</i> sp.	01	06.67
	Sub-total (Dual infection)	09	60.00
6.	<i>Fasciola gigantica</i> + G.I. Nematodes + <i>Paramphistomum</i> sp.	03	20.00
	Sub-total (Triple infection)	03	20.00
	Overall	15	100.00

Of the 15 calves examined, only three (20%) calves had single type of helminth infection, whereas 12 (80%) calves had mixed infection with helminth parasites (Table 1). It appears from Table 1 that only one (6.67%) calf had single gastro-intestinal nematode (GIN) and two (13.33%) calves had single *Fasciola gigantica* infection. 12 calves affected with mixed helminth parasites, of which nine (60.00%) calves had concurrent dual infection with *Fasciola gigantica*, *Paramphistomum* sp. and GIN, and *Paramphistomum* sp.

The overall analysis of helminth infection associated with bottle jaw syndrome in calves showed that highest infection rate was recorded with *Fasciola gigantica* (86.67%), followed by *Paramphistomum* sp. (66.67%) and lowest with gastro-intestinal nematodes (46.67%) infection (Table 2).

Table 2. Age wise distribution of helminths parasitic infection in calves affected with bottle jaw syndrome

S / N	Age of calves (months)	No. of calves examined	<i>Fasciola gigantica</i>	<i>Paramphistomum</i> sp.	G.I. nematodes
1	06	1	-	-	1
2	07	1	-	1	1
3	08	2	2	2	-
4	09	1	1	-	1
5	10	3	3	2	2
6	11	3	3	2	1
7	12	4	4	3	1
Total		15	13 (86.67%)	10 (66.67%)	7 (46.67%)

Parasitological examination of faecal samples of all the 15 (100%) calves affected with bottle jaw syndrome showed gastro-intestinal helminth infection. Both single (20%) and mixed (80%) infection of gastro-intestinal helminths have been recorded to be associated with bottle jaw syndrome in calves. Of the 15 calves examined, 2 (13.33%) calves had *Fasciola gigantica*, 1 (6.67%) had GIN, 6 (40.00%) had concurrent *Fasciola gigantica* and *Paramphistomum* sp., 2 (13.33%) had *Fasciola gigantica* and GIN, 1 (6.67%) had GIN and *Paramphistomum* sp. and 3 (20.00%) cases had mixed infection with *Fasciola gigantica*, GIN and *Paramphistomum* sp. infection. The 2.48% prevalence of bottle jaw in calves has been reported in calves from Bangladesh (Samad *et al.*, 2001b), and this study identified the helminth parasites associated with bottle jaw syndrome in calves. These observations support the report of Radostits *et al.* (2000) who described the occurrence of sub-mandibular and sub-maxillary edema in chronic liver fluke and stomach worm diseases.

Clinical findings of parasitic bottle jaw in calves

It appears from this study that inanition (malnutrition) and gastro-intestinal helminth parasites are mainly associated with bottle jaw syndrome in calve. The most important clinical findings recorded in the 15 selected calves affected with bottle jaw syndrome are shown in Table 3.

Table 3. Clinical findings of calves affected with bottle jaw syndrome

S / N	Clinical findings	Calves affected	
		No.	%
1	Loss of appetite	10	66.67
2	Pale conjunctival mucosae	13	86.67
3	Rough hair coat	12	80.00
4	Dehydration	15	100.0
5	Loss of body condition	15	100.0
6	Weakness	12	80.00
7	Dullness	07	46.67
8	Depression	09	60.00
9	Pot-belly	06	40.00
10	Diarrhoea	13	86.67

Clinical findings of 15 bottle jaw affected calves infested with helminth parasites showed normal rectal temperature (101.93 ± 0.59), pulse (98 ± 8) and respiration (32 ± 4) rate but there were bottle jaw (100%), loss of appetite (66.67%), pale conjunctival mucosae (86.67%), rough hair coat (80%), dehydration (100%), dullness (46.67%), depression (60%), pot-belly (40%) and diarrhoea (86.67). More or less similar clinical findings have been described in certain gastro-intestinal helminth diseases with especially emphasis to fascioliasis, paramphistomiasis and nematodiasis (Harting, 1950; Srivastava *et al.*, 1963; Soulsby, 1982; Amin and Samad, 1987; Pachauri, 1995; Radostits *et al.*, 2000; Samad, 2000b, 2003). The severity of the clinical findings might be associated with severity of the infection, the nutritional status and managerial condition of the calves. Although the bottle jaw is not a specific disease but it is usually a syndrome of another disease, which is resulted from hypoproteinaemia associated with decreased plasma osmotic pressure. The characteristic a non-inflammatory edema in the intermandibular space in ruminants could be useful for tentative diagnosis of GI parasitosis associated with hypoproteinaemia.

Therapeutic management of parasitic bottle jaw in calves

The faecal examination of bottle jaw affected calves showed that all the 15 calves had gastro-intestinal (GI) parasitic infection. These 15 affected calves were equally divided into three treatment groups (A, B and C) according to the type of parasitic infection. The treatment protocol and therapeutic results in bottle jaw affected calves are shown in Table 4.

Table 4. Treatment protocol and therapeutic results in bottle jaw affected calves

Group	Infected with	No. of calves	Pre-treatment EPG	Treatment with (after 4 weeks)	Post-treatment	
					EPG	Status
A	Flukes*	8	512	Tetranid® + Hematopan B ₁₂ ®	-	R
B	Flukes* + GIN	6	559	Tetranid® + Bional Forte®	-	R
C	GIN	1	900	Peraclear® + Bivinal Forte®	-	R

R = Recovery, GIN = Gastrointestinal nematodes, EPG = Eggs per gram of faeces,

*Infection either *Fasciola gigantica* singly or concurrently with *Paramphistomum* sp.

Each calf of group A (n = 8) affected with flukes (*Fasciola gigantica* and/or *Paramphistomum* sp.) was treated with Tetranid® (Techno drugs), followed by Hematopan B₁₂® (Advance Animal Science Co. Ltd.), resulted recovery of all the treated calves within three weeks of post-treatment. Each calf of group B (n = 6) affected concurrently with flukes and GIN, was treated with Tetranid® (Techno drugs), followed by Bional Forte® (Techno Drugs) resulted recovery of all the treated calves with four weeks of post-treatment. The only one calf affected within single GIN infection was treated with Peraclear® (Techno Drugs), followed by Bivinal Forte® (Novartis Bangladesh Ltd.) resulted recovery on three weeks of post-treatment.

Malnutrition and gastro-intestinal (GI) helminth have been recognized to be associated with bottle jaw syndrome in calves. Mixed infection was found more (80%) than single (20%) types of GI helminth parasites in bottle jaw affected calves. All the three groups of calves recovered from bottle jaw syndrome within 7 days of post-treatment but it required about 28 days to recover from severe anaemia. The Tetranid® (Tetramisole + Oxyclozanide) was found to be highly effective against both the flukes and gastro-intestinal (GI) nematodes, which were associated with bottle jaw in calves. These findings support the earlier reports of Coles and Stafford (2001), Prasad and Parvin (2001) and Sahoo *et al.* (2002). The Peraclear® (Fenbendazole) was found to be highly effective against gastro-intestinal nematodes which were associated with bottle jaw in calves. This result supports the result of Benz and Ernst (1978), Craig and Bell (1978), Callinan and Oummins (1979), Haque *et al.* (1987), Jagannath *et al.* (1988), Partani *et al.* (1995), Bali and Singh (1977), Sahoo and Misra (1987) and Singh *et al.* (1994) who reported 100% efficacy of fenbendazole in bovine and caprine gastrointestinal nematodiasis.

Treatment with anthelmintics followed by hematinic drugs resulted 100% recovery of parasitic bottle jaw in calves within 28th day of treatment. Therefore, bottle jaw syndrome in calves, caused by gastro-intestinal helminths, could be successfully treated with anthelmintics with supportive treatment with any effective hematinic drugs.

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