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## Satish Digraskar

Professor and Head,  
Department of Veterinary  
Medicine, COVAS, MAFSU,  
Parbhani-431402, Maharashtra,  
India

## Tawheed Ahmad Shafi

Assistant Professor,  
Department of Veterinary  
Medicine, COVAS, MAFSU,  
Parbhani, Maharashtra, India

## Narladkar Babasaheb

Associate Professor,  
Department of Veterinary  
Parasitology, COVAS, MAFSU,  
Parbhani, Maharashtra, India

## Nithin BS

M. V. Sc. Scholar,  
Department of Veterinary  
Medicine, COVAS, MAFSU,  
Parbhani, Maharashtra, India

## Successful medicinal management of visceral schistosomiasis in cattle

Satish Digraskar, Tawheed Ahmad Shafi, Narladkar Babasaheb and Nithin BS

### Abstract

The clinical cases of visceral schistosomiasis in cattle manifested symptoms of watery mucoid diarrhoea mixed with blood/blood clots, anorexia, dehydration, tenesmus, anal spasms, streaks of bleeding following straining and soiling of hind quarters with loose feces. Fecal examination of all the affected bullocks, performed by sedimentation technique revealed eggs of *Schistosoma* spp. The epithelial shreds in the feces also demonstrated eggs of *Schistosoma* spp. embedded in the tissues. The bullocks were treated with praziquantel @ dose rate of 20 mg/kg body weight orally at three days interval for 2-3 occasions. The supportive therapy was comprised of injectable ciprofloxacin, fluids, haematinics, antispasmodics, ascorbic acid and multivitamin preparations. Among nine affected bullocks, eight responded to the therapy and one severe anemic bullock died on the third day of presentation. The clinical trial indicated Praziquantel along with standard supportive therapeutic regimen is efficacious for the treatment of schistosomiasis in cattle.

**Keywords:** *Schistosoma* spp., Tenesmus, Fecal examination, Sedimentation, Praziquantel

### Introduction

Schistosomiasis is an economically important parasitic disease of domesticated animals in tropical and sub-tropical countries (Ayanda, 2009) [1]. Among various species *Schistosoma indicum* and *Schistosoma spindale* are the common causes of visceral schistosomiasis in cattle (Kumar and Burbure, 1986) [6]. The disease is widely distributed in cattle, buffaloes, sheep and goats in India. Although most infections in endemic areas are subclinical but higher prevalence causes significant losses in terms of growth, productivity and increased susceptibility to other parasitic or bacterial diseases (Pitchford and Andvisser, 1982; Dargie, 1987) [3, 8]. The pathology and clinical signs are due to irritation caused by the spined eggs and thus cattle exhibit typical clinical signs such as marked diarrhoea mixed with blood or mucous, dehydration, pallor of mucus membrane marked weight loss, emaciation and decreased production (Bont, 1995) [2].

The present paper puts on record medicinal management of visceral schistosomiasis in nine clinical cases of bullocks of different breeds.

### Materials and Methods

The present study was conducted to record occurrence of visceral schistosomiasis and to evaluate its effective therapeutic regimen in cattle. Nine clinical cases of cattle suffering with severe watery mucoid diarrhea containing blood/blood clots, anorexia, dehydration, tenesmus, anal spasms, and streaks of bleeding following straining while defecation and soiling of hind quarters with watery feces were included in the clinical trial. These cases were earlier treated at village hospital with antibiotics, NSAID and astringent preparations with only transient response.

### Faecal examination

The faecal examination, corn stone for diagnosis of schistosomiasis was conducted in all the affected bullocks by Sedimentation technique (Urquhart *et al.*, 1987) [11] that revealed typical eggs of *Schistosoma* spp. with spine at terminal end. Few eggs were attached to intestinal mucosa confirming diagnosis of visceral schistosomiasis.

Further, the blood samples of all the affected bullocks were analysed for haematological and biochemical profile by standard procedures.

### Correspondence

#### Tawheed Ahmad Shafi

Assistant Professor,  
Department of Veterinary  
Medicine, COVAS, MAFSU,  
Parbhani, Maharashtra, India

### Liver function tests

Being clinical cases of visceral schistosomiasis, the samples were also subjected to the estimations of total bilirubin, direct bilirubin, indirect bilirubin, AST, ALT, alkaline phosphatase, Van Den Bergh Test and Fouchet's Test to assess extent of hepatic insufficiency.

### Therapy

The affected bullocks were treated with Praziquantel @ 20 mg/kg body weight orally, at three days interval till the faecal samples were negative (2 to 3 times). The supportive therapeutic regimen comprised of injectable ciprofloxacin, fluids, haematinics, antispasmodics, ascorbic acid and multivitamin preparations.

### Results and Discussion

Visceral schistosomiasis is common infection in cattle of Asian sub-continent and adjacent countries causing severe morbidity in animals (Srivastava, 1960) [9]. Detection of subclinical schistosomiasis is difficult due to absence of obvious signs and such animals act as carriers and remain a threat to other susceptible animals (Sumanth *et al.*, 2004) [10]. Clinical examination of the affected cattle revealed elevated rectal temperature ( $103.59 \pm 1.1$ ) polypnoea ( $33.78 \pm 6.5$ ), tachycardia ( $89.56 \pm 8.9$ ), pallor mucous membranes, suspended rumination and abdominal pain. The affected bullocks exhibited anorexia, dehydration, anaemia, passage of loose watery mucoid faeces, anal spasms and tenesmus. (Fig. 1-4). Three of the nine bullocks also exhibited signs of wind sucking at frequent intervals suggestive of intestinal irritation by spiny *Schistosoma* eggs. Frequent passage of watery mucoid faeces containing blood/ blood clot, spoiling both the buttocks was observed in all the cases. Streaks of fresh bleeding after/following straining during defecation was observed in 5 out of 9 affected bullocks. One severely anaemic bullock (Hb 3.8 gm/dl) died on the third day of presentation.



Fig 1: Bullock showing straining



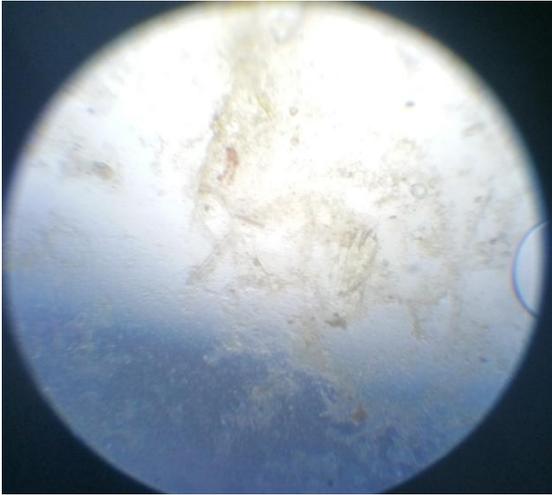
Fig 2: Bullock showing wind sucking



Fig 3: Bullock showing watery diarrhoea



Fig 4: Bullock showing bloody diarrhoea



**Fig 5:** Faecal examination showing *Schistosoma* spp. eggs

The faecal sample examination by sedimentation technique demonstrated typical eggs of *Schistosoma* spp. bearing a spine at terminal end (Fig.5)

Haematological analysis of affected bullocks indicated decrease in Haemoglobin ( $6.93 \pm 1.0$  gm/dl), PCV ( $21.89 \pm 3.2$ ) TEC ( $4.31 \pm 0.7$  millions/cumm), TLC ( $17.34 \pm 2.5$ ), neutrophillia ( $55 \pm 7.4$ ), lymphopenia ( $32.44 \pm 7.1$ ) and thrombocytopenia ( $1.27 \pm 0.3 \times 10^5$ /microlitre). Blood biochemical profile indicated hypoproteinemia ( $5.83 \pm 0.8$ ), hypoalbuminaemia ( $2.49 \pm 0.4$ ), hyperglobinaemia ( $3.34 \pm 0.5$ ), increased total bilirubin ( $12.3 \pm 2.9$ ) and direct bilirubin ( $6.7 \pm 1.7$ ), AST ( $249.77 \pm 65.2$ ), ALT ( $76.3 \pm 29.3$ ) and ALP ( $294.47 \pm 47.4$ ) and positive Van Den Berghs and Fouchest test. Hepatopathy as evidenced by derangement in the liver function parameters is attributed to damage caused by schistosomes and granulomatous reaction around *Schistosoma* spp. eggs in the hepatic tissue (Leder and Weller, 2009) [7].

All the 9 clinical cases were treated with Praziquantel @ 20mg/kg body weight PO administered at three days interval for 2 to 3 occasions. Among 8 survived cases, 2 bullocks with mild infection showed absence of *Schistosoma* spp. eggs on 7<sup>th</sup> day of therapy (2 doses of Praziquantel) while remaining 6 bullocks faecal samples were negative on 10<sup>th</sup> day of therapy (3 doses of Praziquantel). The supportive therapy viz. fluid and electrolytes, haematinics, ascorbic acid, multivitamins and astringent preparation augmented clinical recovery. All the 8 clinical cases were under observation for 4 weeks period. Praziquantel increases the permeability of membranes of *Schistosoma* spp. cells towards calcium ions, resulting in severe spasms and paralysis of the parasites (Keiser and Utzinger, 2004) [5].

Praziquantel is a current drug of choice for schistosomiasis (Harnett, 1988) [4] and in the present clinical trial Praziquantel along with standard set of supportive therapy was found highly efficacious in the treatment of visceral schistosomiasis in cattle.

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