

DETECTION AND CHEMOTHERAPY OF *Balantidium coli* IN BUFFALOES AROUND LAHORE, PAKISTAN

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A study was conducted for the detection of *Balantidium coli* and to determine the comparative efficacy of ampicillin, secnidazole and neem seeds (*Melia Azadarch linn*) against balantidiosis in buffaloes around Lahore. A total of two hundred buffaloes were examined coprologically. Of those, 40 were found positive (20%), twenty-four buffaloes having balantidiosis were selected for chemotherapeutic trials and were divided into four equal groups. The efficacy of drugs was determined on the basis of disappearance of clinical signs and reduction of cysts/trophozoites in faeces. It was concluded that secnidazole (Dysen forte) is the drug of choice for the treatment of bovine balantidiosis.

Keywords: *Balantidium coli*, buffaloes, ampicillin, secnidazole, *Melia azadarch* Linn, trophozoites

INTRODUCTION

Balantidiosis or ciliate dysentery clinically manifests as diarrhea or dysentery, characterized by severe colic, tenesmus, anorexia and occasionally nausea, vomiting. *B.coli* infection has been reported in water buffalo, crossbred cattle, ongole cattle, camel, chimpanzee and dog. The infection occurs by ingestion of cysts or trophozoites (Ichhpujani and Bhatia, 1994). Balantidiosis is encountered worldwide, but infection rate is more common in tropical and subtropical regions (Sampurna, 2007). Epidemiology and effects on the host are similar to those of *Entamoeba histolytica* (Larrys and Roberts, 2005). Balantidiosis is a zoonosis and human beings have natural resistance to this infection. The infection can take one of the three clinical forms; chronic, acute or fulminating. Chronic form is most common and characterized by diarrhea alternating with constipation. Acute form causes appendicitis, perforation of colon, urinary tract infection, vaginitis, liver abscess and pulmonary infection (Ichhpujani and Bhatia, 1994). Fulminating cases may produce necrosis and sloughing of the overlying mucosa of large intestine (Roberts and Janovy, 2005).

Diagnosis is usually made by identifying trophozoites or cysts of *Balantidium coli* in the stools or in a biopsy specimen taken through a sigmoidoscope, or by finding trophozoites in the ulcers at autopsy (Sampurna, 2007).

The comparative efficacy of oxytetracycline, secnidazole and metronidazole was observed against naturally *Balantidium coli* infected cattle. The results revealed that secnidazole was more effective than oxytetracycline or metronidazole (Bilal and Qasim, 2006). The comparative therapeutic efficacy of tetracycline hydrochloride and metronidazole plus furazolidone was studied in naturally *B.coli* infected buffalo calves. The study showed that 100% elimination of *B.coli* cysts or trophozoites was recorded on 3rd day of treatment (Sengar and Singh, 2006). The objective of present study was to determine the infection percentage of *Balantidium coli* in buffaloes and to find out best treatment of the infection.

MATERIALS AND METHODS

Infection rate

A total of two hundred buffaloes irrespective of sex, age and breed were examined coprologically to determine the *B. coli* infection rate in buffaloes. The faecal samples were processed using Direct Smear method as described by Urquhart *et al* (1996) and Sedimentation method as described by Soulsby (1982).

Therapeutic trial

Twenty-four naturally infected buffaloes with *B. coli* were randomly selected and divided into following four groups each comprising six animals.

Table 1. Drugs used in different groups with dose rates

Groups	Drug	Dose Rate
A	Ampicillin (inj.Penbrit, Smith Kline Beecham, Pvt, Ltd).	10mg/kg body weight, I.M. for three consecutive days
B	Secnidazole (Dysen forte, Nabi Qasim Pvt, Ltd)	10 mg/kg body weight, orally once only
C	<i>Melia Azadarch linn</i> seeds (Neem)	200 mg/kg body weight, orally once only
D	Untreated infected	Positive control

Faecal examination was performed on day 0 (pre-medication), 3rd, 7th and 10th day (post-medication). The efficacy of drugs used was determined on the basis of disappearance of clinical signs and by reduction in cysts/ trophozoites of *B.coli* in faeces.

The data were analyzed by two way analysis of variance (ANOVA Table) technique and Least Significance Difference (LSD) test for the comparison of the groups (Steel and Torrie, 1982) and (Zar, 2004).

RESULTS AND DISCUSSION

Detection

The faecal samples from 200 buffaloes reared in and around Lahore (buffalo colonies) were studied and examined coprologically for the detection of *Balantidium coli*. Of 200, 40 were found positive for *Balantidium coli* yielding the percentage of 20%. (Figure-1). The cyst of *Balantidium coli* in faeces of buffalo is shown in plate-I.

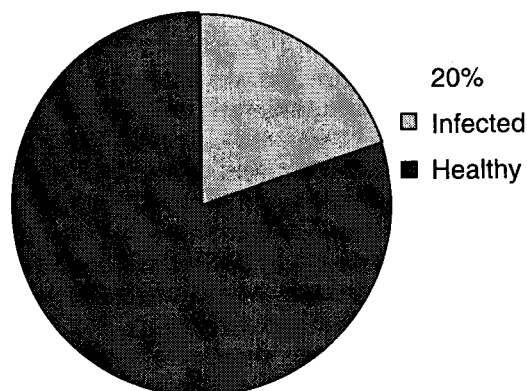


Figure 1. Prevalence of *Balantidium coli* in buffaloes around Lahore.

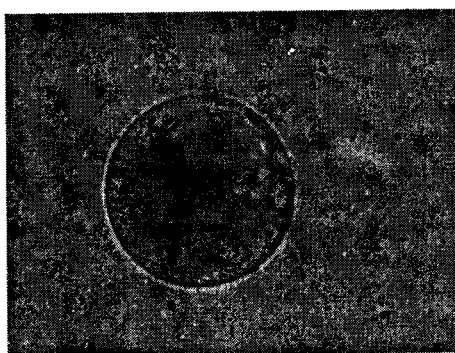


Plate 1. Cyst of *Balantidium coli*

The results of the present study are in confirmation with Niphadkar and Raote (1994) who reported that the prevalence of *Balantidium coli* in calf as of 20% in Bombay, India. The results are also in agreement with

Udupa *et al.* (1998) who reported that *B. coli* prevalence rate was 17.07% in buffaloes screened with the history of enteritis. The present findings are in close agreement with the findings of Bilal and Qasim (2006) who studied the prevalence of *Balantidium coli* in cattle around the River Ravi bank, Lahore. They reported that the prevalence rate of balantidiosis was 25%. The results of present study are in line with the findings of Niphadkar and Raote (1994) who examined cattle farms around Bombay, India and reported that *Balantidium coli* prevalence rate was 27.5% in heifers in India.

The present findings differ from the results of Rajkovic *et al.* (1997) who studied the prevalence of endoparasites in 150 cows in Croatia. The commonest parasite was *Balantidium coli* found in 72 cows, so the prevalence of 48% has been recorded. The results differ with the findings of Islam *et al.* (1988) who reported that the prevalence of *Balantidium coli* was 12%, in cattle in Bangladesh. This disagreement might be due to climate difference.

Therapeutic study

Efficacy of drugs used in this study was determined on the basis of reversal of clinical signs and reduction in cysts/ trophozoites count of this parasite. The cyst count pre and post medication on day 0, 3, 7 & 10 was different in the groups A, B, C and D as given in (Table 2.) Efficacy of ampicillin (inj. Penbritin) was 16, 16 and 33% on day 3, 7, and 10 respectively; efficacy of secnidazole (Dysen forte) was 25, 66 and 83% on day 3, 7, and 10 respectively, and efficacy of *Melia Azadarch* (Neem) was 16, 33 and 50% on day 3, 7, and 10 respectively (Figure 2).

The result is similar to that of Parra *et al.* (2003) who used ampicillin as the first selection in children suffering from *Balantidium coli* / acute diarrhea. The result also correlated with Akhtar (2005) who described that ampicillin may be used to treat enteric infections. The finding did not agree with that of Bonfiglio *et al.* (2002) who reported that antibiotic susceptibility revealed that only 4% *B.coli* strains were susceptible to ampicillin. The animals of group B were treated with secnidazole (Dysen forte) at a dose rate of 10mg/kg body weight orally for one day, according to the manufacturer's instructions (Nabi Qasim Pvt, Ltd). This group showed 83% efficacy at day10 (post-medication). The results of present study are in accordance with Bilal and Qasim (2006) who studied prevalence of *Balantidium coli* in cattle around the bank of River Ravi, Lahore. The comparative efficacy of oxytetracycline, metronidazole and secnidazole on day 10 (post-medication) was 62.5%, 37.5% and 75% respectively. He concluded that secnidazole was more effective than oxytetracycline or metronidazole.

Table 2. Cyst counts in various groups at day 0, 3, 7 and 10

Group	Drug	Mean cyst count (per slide square inch/animal)			
		0 day	3 rd day	7 th day	10 th day
A	Ampicillin	2.33 ± 0.81	1.50 ± 0.83	0.83 ± 0.7	.83333 ± .75277
B	Secnidazole	1.5 ± 0.54	0.83 ± 0.75	0.16 ± 0.40	.1667 ± .40825
C	Neem seeds	1.83 ± 0.75	1.16 ± 0.75	0.50 ± 0.54	.5000 ± .54772
D	Positive control	2.2 ± 0.40	1.83 ± 0.40	1.0 ± 0.00	1.0000 ± .00000

• = Significant @ P < 0.05

Comparative Efficacy

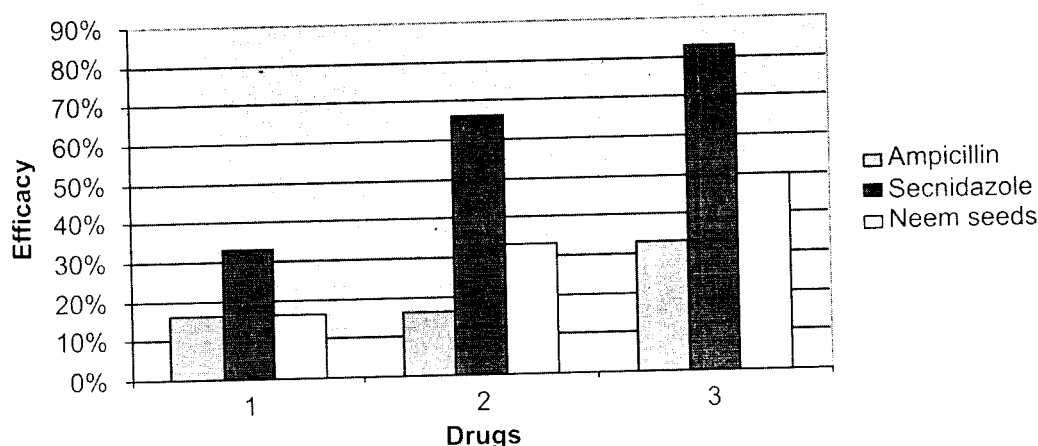


Figure 2. Overall efficacy (%age) of Ampicillin, Secnidazole and Neem Seeds

Present findings are in line with Raether and Hanel (2003) who reported that nitro heterocyclic compounds can be used as therapeutic agents in the treatment of giardiasis, trichomoniosis, balantidiosis and histomoniosis. The most relevant drugs were secnidazole, metronidazole, benznidazole and furazolidone.

The animals of group C were treated with *Melia Azadarch linn* (Neem seeds) at a dose rate of 200mg/kg body weight orally for one day, purchased from local market. This group showed 50 % efficacy at day10 (post- medication).

The findings of present study agree with those of Satyaviti *et al.* (1987) who reported that crude *Melia Azadarch linn* (Neem seeds) or its extracts in certain solvents possess insecticidal, antifungal, antiprotozoal and antiviral properties.

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