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PREVALENCE AND CHEMOTHERAPY OF ASCARIASIS IN BUFFALOES

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SUMMARY

The prevalence and chemotherapy of ascariasis in buffaloes were studied at the Department of Clinical, Medicine and Surgery, University of Agriculture, Faisalabad, Pakistan. Of the 1377 buffaloes referred to the clinic over a one-year period (January to December, 1995), ascariasis was diagnosed in 96 (7%) animals. The prevalence was significantly higher (96%) among animals below the age of 3 months, but sex had no bearing on the prevalence of the disease. Most cases of ascariasis were reported at autumn (16%), followed by winter (7%), spring (6%) and summer (4%). An anthelmintic trial using tetramisole, fenbendazole and ivermectin on naturally infected buffalo-calves revealed high efficacy of tetramisole (90%), followed by ivermectin (82%) and fenbendazole (72%).

Keywords: Ascariasis, buffaloes, prevalence, chemotherapy

INTRODUCTION

Ascariasis is one of the most important parasitic diseases of young buffalo calves. It causes great economic loss in the form of digestive disturbances such as diarrhoea and constipation, emaciation, retarded growth and death in young animals (Soulsby, 1982). The disease is caused by *Toxocara vitulorum,* a relatively common, large nematode found in the large intestine. Because of its larval migration, *T. vitulorum* has become considerably more important than other parasites. Its occurrence in Pakistan has been reported to be between 38 to 48% (Hayat *et al.,* 1990) while mortality ranges from 30 to 80% (Afzal *et al.,* 1980).

The present study determines the prevalence of *T. vitulorum* in buffaloes in the area surrounding the University of Agriculture, Faisalabad and the therapeutic effects of tetramisole, fenbendazole and ivermectin against *T. vitulorum*.

MATERIALS AND METHODS

Study site and animals

The study was conducted at the Department of Clinical, Medicine and Surgery, University of Agriculture, Faisalabad, Pakistan. The one-year study period (January to December, 1995) was divided into 4 seasons: winter (November to February), spring (March to April), summer (May to August) and autumn (September to October). A total of 1377 buffaloes of age ranging from 1 month to 8 years old were referred to the clinic for treatment of various diseases.

Prevalence study

Faecal samples were obtained from each animal, either from the rectum or at the time of defaecation. The samples were examined by the direct smear method described by Soulsby (1982) to determine the presence of the parasite while faecal egg counts were determined using the McMaster egg counting technique. The counts were expressed as eggs per gram of faeces (epg) (Coles, 1986).

Therapeutic trials

A total of 80 buffalo-calves below the age of 1-year old that suffered from various severity of natural infection by *T. vitulorum* were selected for this study. They were randomly divided into four groups consisted of 20 calves per group. Calves in group 1 were subjected to a single oral treatment with tetramisole (Vesonil, Sanofi) at a dose rate of 15 mg/kg bodyweight while calves in group 2 were similarly treated with fenbendazole (Panacur, Ciba Giegy) at a rate of 5 mg/kg bodyweight. Calves in group 3 received a subcutaneous injection of 0.2 mg/kg ivermectin (Ivotek, Star Laboratories, Pakistan) while calves in group 4 were kept as untreated control.

Faecal egg counts were monitored on days 0, 7 and 18 post-treatment.

Data processing

The efficacy of the drugs used in the trial were calculated based on the reductions in the faecal egg counts at days 7 and 18 (Moskey and Harwood, 1941) using the following formula:

$$\text{Percent efficacy} = \frac{a-b}{a} \times 100$$

where a = arithmetic mean of epg on day 0
b = arithmetic mean of epg on day x after treatment

RESULTS

Prevalence

A total of 96 (7%) of the 1377 buffaloes examined were found positive for eggs of *T. vitulorum*. The severely affected animals were anorexic and emaciated with roughened coat and sunken eyes. Few animals had either constipation or diarrhoea, while some showed arching of the back, colic and stiff gait.

The highest prevalence (25%) was in September while the lowest prevalence (2%) was in July (Table 1). Thus, the highest prevalence (16%) was recorded in autumn while the lowest (4%) was in summer (Table 2).

Table 1. Prevalence of ascariasis in buffaloes according to month

Month	No. of animals	No. positive	% infection
January	85	6	7
February	88	4	5
March	82	4	5
April	85	6	7
May	170	5	3
June	93	4	4
July	186	4	2
August	188	10	5
September	95	24	25
October	166	18	11
November	69	6	9
December	70	5	7
Total	1377	96	

Sex did not effect the prevalence as well as the severity of the disease. However, the prevalence was high (96%) in animals under 3 months of age (Table 3).

Therapeutic trials

After 18 days of treatment, tetramisole and ivermectin showed high activities against *T. vitulorum* with 90 and 82% efficacy respectively whilst fenbendazole showed an efficacy of 72%. The body conditions of all affected animals improved gradually following treatment compared to the control untreated group, which showed a gradual increase in the faecal egg counts during the course of the study period (Table 4).

Table 2. Prevalence of ascariasis in buffaloes according to season

Season	No. examined	No. infected	% infection
Winter	312	21	7
Spring	167	10	6
Summer	637	23	4
Autumn	261	42	16
Total	1377	96	

Table 3. Prevalence of ascariasis in buffaloes according to age and sex

	Age		Sex	
No. infected	Below 3 mo.	Above 3 mo.	Male	Female
96	92 (96%)	4 (4%)	56 (58%)	40 (42%)

Table 4. Comparative efficacy of tetramisole, ivermectin and fenbendazole against *T. vitulorum* infection in buffalo-calves

	Mean epg	% efficacy	
Drug used	before treatment	7th day	18th day
Tetramisole 15mg/kg	8400	71%	90%
Fenbendazole 5mg/kg	8200	62%	72%
Ivermectin 0.2mg/kg	8500	42%	82%
Control	8300	14900	15300

DISCUSSION

The overall prevalence of ascariasis obtained in this study was low, similar to those recorded in Ghana by Agyes (1993). A much higher prevalence has been reported by Srivastava and Sharma (1981), who recorded a 17% prevalence while Hayat *et al.* (1990) reported a range of between 38 to 48% rate in buffalo-calves. The difference may be due to the fact that most animals examined in the present study were over 6 months of age while those studies concentrated on young buffalo-calves. The prevalence in buffalo-calves below 3 months old was high in this study compared to those of Srivastava and Sharma (1981) and Hayat *et al.* (1990) but similar to those of Sarwar and Nawaz (1961), Afzal *et al.* (1980), Sahoo *et al.* (1991) and Agyes (1993).

High prevalence were observed in the months of September, October and November with least prevalence in July. These findings are consistent with those reported earlier in Pakistan by Sarwar and Nawaz (1961) and Masud and Majid (1984). The high prevalence during the autumn season may be due to the stress of breeding, poor nutrition and adverse climatic conditions.

The high efficacy of tetramisole against ascariasis in buffalo-calves has been demonstrated. Prasad (1985), in a trial on buffalo-calves naturally infected with *T. vitulorum,* found that tetramisole was 98% effective while Hussain *et al.* (1980) and Smith (1974) reported 99 and 96% effective respectively. The 72% efficacy of fenbendazole observed in the present study is in agreement with those reported by Sinha *et al.* (1985) and Prasad (1985), while the efficacy of ivermectin observed in the present study is similar to those observed by Ciordia *et al.* (1984) and Shastri (1989). It appears that tetramisole is the drug of choice for the treatment of ascariasis in buffalo-calves followed by ivermectin and fenbendazole.

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RINGKASAN

PREVALENS DAN KEMOTERAPI ASKARIASIS KERBAU

Prevalens dan kemoterapi askariasis pada kerbau telah dikaji di Department of Clinical, Mecidine and Surgery, University of Agriculture, Faisalabad, Pakistan. Daripada 1377 ekor kerbau yang dirujuk dalam tempoh satu tahun (1995), askariasis telah direkodkan dalam 96 (7%) ekor kerbau. Prevalens ini adalah lebih tinggi (96%) di kalangan kerbau berumur kurang daripada 3 bulan. Jantina tidak memberi kesan terhadap prevalens penyakit. Kebanyakan kes askariasis telah dicerapkan pada musim luruh (16%), diikuti musim sejuk (7%), musim bunga (6%) dan musim panas (4%). Satu percubaan antelmintik menguna tetramisol, fenbendazola dan ivermektin telah dijalankan pada anak kerbau yang terjangkit semula jadi. Kemujaraban tinggi diperolehi dengan tetramisol (90%) diikuti ivermektin (82%) dan fenbendazola (72%).