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INFECTION RATE AND CHEMOTHERAPY OF VARIOUS HELMINTHES IN DIARRHOEIC SHEEP IN AND AROUND LAHORE

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ABSTRACT

The present study was carried out to find out the infection rate of gastrointestinal tract helminthiasis and its association with diarrhoea in sheep in Lahore, Pakistan. For this purpose, 300 faecal samples from sheep suffering from diarrhoea presented at the Outdoor Hospital, Department of Clinical Medicine and Surgery (CMS) and various private and government veterinary hospitals located in Lahore were collected and examined coprologically for the presence of helminthes. Overall infection rate of GIT helminthes in sheep was 70.67%. Infection rate of nematodes was higher (50.67%) than trematodes (18.67%) and cestodes (1.34%).The efficacy of albendazole sulphoxide was 67%, 90% and 98% at day 3, 7 and 14, respectively, while the efficacy of albendazole was 47%, 88% and 96% at day 3, 7 and 14, respectively. Lowest efficacy of Garlic powder 8%, 16% and 21% at day 3, 7 and 14, respectively was observed. It may be concluded that albendazole sulphoxide is the most effective drug against these helminthes in sheep.

Key words: Diarrhoea; Efficacy; Albendazole; Albendazole sulphoxide; Garlic powder.

INTRODUCTION

Sheep and goats, although representing an important source of animal protein in third world countries such as Pakistan, seem to have benefited little from veterinary care and production improvement. Sheep and goats are often the main source of daily meat and are used in ceremonial festivities throughout the country. Together, sheep and goats provide a large portion of the meat consumed and produce a considerable amount of manure, which is of special importance in those areas where cattle are of lesser importance (Nawathe *et al*., 1985).

Sheep and goats harbour a variety of gastrointestinal tract (GIT) parasites, many of which are shared by both species. Among these parasites, helminths are the most important GIT parasites that affect the growth as well as production of the animals. Gastrointestinal nematodes of *Trichostrongylidae* family are perhaps the most important parasites of small ruminants world-wide, causing significant morbidity and loss of production (Pawel *et al*., 2004). Helminthic infections can be treated by anthelmintic chemotherapy, however, treatment is costly and drug resistance has evolved in all major parasite species (Ross, 1997; Zajac and Gipson, 2000; Veale, 2002). According to Sutton *et al*., (999) many people in Israel consider garlic as a viable alternative to commercial anthelmintics.

In Pakistan, little information is available on infection rate, diversity and intensity of helminthes as cause of diarrhoea in small ruminants. Moreover, there are a few studies regarding efficacy and resistance against the common dewormers being used in the field as prophylactic and therapeutic agents. Hence the present study was designed to study the infection rate of gastro-intestinal helminthes in sheep, evaluate the efficacy of various anthelmentics under local conditions and investigate the side effects of the anthelmentics.

MATERIALS AND METHODS

Sources of samples: Diarrhoeic sheep presented at the Outdoor Hospital, Department of Clinical Medicine and Surgery (CMS) and various private and government veterinary hospitals were examined for the presence of helminthes during September to November, 2007. The samples obtained were processed at Medicine Laboratory University of Veterinary and Animal Sciences (UVAS), Lahore. A total of 300 cases of sheep suffering from diarrhoea were included in the study.

Collection of faecal samples: Five grams faecal sample was collected directly from the rectum of each sheep in a clean polythene bag. These faecal samples were labeled and refrigerated till further processing

Analysis of faecal samples: The faecal samples were analysed by Direct Smear Method and Salt Flotation Technique for the presence of eggs of helminthes. Eggs per gram (EPG) were counted by using Mac-Master Technique as described by Soulsby (1982). The helminthic ova were identified by using key as described by Soulsby (1982).

Chemotherapy trials: Sixteen animals positive for helminthes were randomly divided into four groups A, B, C and D each comprising of 4 animals. The animals in group A were treated with albendazole sulphoxide (Ricozole –S, Selmore Pharmaceuticals Pakistan) @ 4mg/kg orally; the members of group B were given albendazole (Albenzole granules; Selmore Agency Pakistan) @ 10 mg/kg orally, while animals in group C were treated with garlic powder(National Garlic Powder) @ 5gm/animal. The animals in group D were kept as control. Egg per gram (EPG) of the animals in all groups were counted at Day 0 (Pre-treatment) and day 3, 7, 14, (Post-treatment) using Mac-Master technique. The efficacy of drugs was calculated as per formula described by Varady *et al*. (2004)

[**(**Pretreatment EPG - Post treatment EPG / Pretreatment EPG] * 100

Side effects: The side effects were noted during the trial in the present study.

Statistical analysis: The data thus obtained were analysed at different angles by calculating percentage positivity of helminthes. Whereas data of drug efficacy was analysed by using one way ANOVA (Steel *et al*., 1997).

RESULTS AND DISCUSSION

Infection Rate: The results of present study revealed an overall infection rate of GIT helminthes in sheep 70.67%. These findings are in conformity with the results of Raza *et al*. (2007) who reported 62% infection rate of helminthes in sheep in Southern Punjab. When stratified class wise, the highest infection rate of nematodes (50.67%) was observed followed by trematodes (18.67%) and cestodes (1.34%) in table 1. *Haemonchus contortus, Strongylus papillosus, Trichiuris globulosa, Trichostrongylus spp*., *Ostertagia circumcinta* were the main nematode species found in sheep. The infection rate of *Haemonchus contortus* in sheep was 40% which is congruent with the findings of Jacquit *et al*. (1992). Similarly, Uriarte and Valderrábano (1989) reported *Ostertagia spp., Nematodirus spp, Trichostrongylus spp, Haemonchus spp*. and *Chabertia* species prevalent in sheep. The findings of these workers are also congruent with the findings of the present study. Our results also correlate with the findings of Fakae (1990), who reported infection rate of *Haemonchus contortus* (87.1%), *Trichostrongylus spp.* (63.8%), *metacestodes of Taenia hydatigena* (30.2%), *Oesophagostomum columbianum* (22.4%), *Strongyloides spp.* (18.8%), *Cooperia spp.* (17.2%), *Gaigeria pachyscelis* (6.0%), *Moniezia expansa* (6.0%), *Bunostomum trigonocephalum* (4.3%), *Trichuris ovis* (3.5%), *Capillaria spp*. (0.9%) and *paramphistomes* (0.9%) in Eastern Nigeria. The main trematodes species recovered from sheep in the present study were *Fasciola hepatica* and *Cotylophoron cotylophorum.* These findings are congruent with the findings of Sheikh (1984) who reported 12.89% infection rate of *Fasciola hepatica* in sheep. In the present study the infection rate of *Fasciola hepatica* was 14.67% which is in conformity with the results of Ndao *et al*., (1995). In the present study it was observed that *Moniezia expansa* (1.34%) was the only cestode prevalent in sheep in study area. Similarly, Prokopic *et al.* (1976) and Fagbemi and Dipeolu (1983) reported the *Moniezia expansa* in sheep in Afghanistan and Southern Nigeria, respectively. Our findings are also in agreement with the findings of of Fakae (1990) who reported *Moniezia expansa* (6%) in small ruminants in Nigeria. The minute difference may be attributed to different geoclimatic conditions and study area. Similarly Ndao *et al*. (1995) reported three trematodes (*Fasciola gigantica, Schistosoma bovis, Amphistomatids*), 2 cestodes (*Moniezia expansa, Cysticercus tenuicollis*) and 9 nematodes in sheep of Senegal. Nwosu *et al.* (1996) also reported *Moniezia expansa* in sheep and goats which is congruent with the findings of the present study.

Chemotherapy: The EPG values and percent efficacy are shown in table 2 and 3, respectively. Albendazole sulphoxide significantly reduced the EPG, followed by albendazole and garlic powder compared with positive control group. The efficacy of albendazole sulphoxide was 67, 90 and 98% at day 3, 7 and 14, respectively, while the efficacy of albendazole was 47, 88 and 96% at day 3, 7 and 14, respectively. The lowest efficacy of garlic powder 8, 16 and 21% at day 3, 7 and 14, respectively was observed. The efficacy of albendazole sulphoxide and albendazole was significantly higher ($p<0.05$) than garlic powder. Waruiru (1997) also reported that closantel, albendazole and levamisole significantly reduced the worm burdens in animals infected with GIT helminthes. These findings are in close alignment with the results of present study. Similarly, Ram *et al*. (2007) reported the efficacy of albendazole plus rafoxanide combination as 54%, which do not agree with our findings. The reason may be the drug resistance of parasite against albendazole in the study area**.** According to Sutton *et al*., (999) many people in Israel consider garlic as a viable alternative to commercial anthelmintics. In the present study no adverse reaction/side affects of the drugs used were reported.

Form this study it was concluded that GIT helminthes in sheep are of significant importance in Lahore and that albendazole sulphoxide is the most effective drug against these helminthes followed by albendazole and garlic powder. Furthermore it is recommended that, the veterinarians working in the field should consider GIT helminthes in differential diagnosis of diarrhoea in sheep.

Table 1. Infection rate of different parasitic species in diarrheic sheep in Lahore

Parasite Species	Number of positive samples	Infection rate (%)
Nematodes		
Haemonchus Contortus	120	40.00
Strongylus papillosus	12	4.00
Trichiuris globulosa	8	2.67
Trichostrongylus spp	04	1.34
Ostertagia circumcinta	08	2.67
Trematodes		
Fasciola hepatica	44	14.67
Cotylophoron cotylophorum	12	4.00
Cestodes		
Moniezia expansa	04	1.34

Table 2. EPG values (Mean ± SD) in sheep of various groups at day 0, 3, 7 and 14.

Group	EPG at day			
	0	3	7	14
A**	613 ± 139.01	200 ± 35.36	63 ± 23.94	13 ± 12.50
B*	600 ± 100.00	325 ± 77.72	75 ± 14.43	25 ± 14.43
C	475 ± 179.70	438 ± 173.66	400 ± 172.0	375 ± 161.38
D	475 ± 137.69	725 ± 105.08	888 ± 128.09	1038 ± 134.44

** Highly significant, * significant, ± SD P<0.05

Table 3. Efficacy of various drugs against GIT helminthes in sheep at different days.

Drug	Efficacy (%) at day		
	3	7	14
Albendazole sulphoxide	67	90	98
Albendazole	47	88	96
Garlic powder	8	16	21

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