

INCIDENCE AND CHEMOTHERAPY OF GASTROINTESTINAL NEMATODES IN DAIRY BUFFALOES IN THE NORTH-WESTERN VALLEY OF PAKISTAN

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ABSTRACT

Faecal samples from a total of 500 male and female adult buffaloes were examined for incidence of gastro-intestinal nematodes in Charsaddah District in the North-Western Valley of Pakistan. A minimum of 100 samples each month were collected and examined for nematode infestation. A chemotherapeutic trial was conducted to ascertain the efficacy of albendazole and levamisole HCL against gastro-intestinal nematodes. A large spectrum of nine helminth genera was found in 233 (46.6%) infected animals. The nematodes infecting buffaloes were: *Trichostrongylus* (23.40%), *Oesophagostomum* (18.91%), *Haemonchus* (13.80%), *Neoascaris* (13.14%), *Ostertagia* (9.61%), *Bunostomum* (6.41%), *Strongyloides* (6.09%), and *Mecistocirrus* (5.12%), respectively. The most common rate of infection found was *Oesophagostomum* in males (25%) and *Trichostrongylus* in females (24.60%). Overall higher ($P < 0.05$) incidence was observed in male as compared to female animals. The efficacy of albendazole and levamisole HCL against gastrointestinal nematodes in buffaloes was, 96% and 98%, respectively. Moreover, both drugs showed nearly the same rate of eggs per gram reduction over the post treatment period of day one, four, seven, and fourteen, mean counts from control buffaloes did not change ($P < 0.05$) markedly during the post-treatment period. It was concluded that infection of gastro-intestinal nematodes is prevalent in the adult buffaloes of the North-Western Valley of Pakistan. Both albendazole and levamisole equally effective to control this infection under local conditions.

INTRODUCTION

Dairy buffaloes are of high economic
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importance in Pakistan. Pakistan ranks third in the world with 12.89% of the global buffalo population but it contributes 19.94% of global meat and 26.13% of global milk (FAO 1993). The Pakistan buffalo population recorded a growth rate of 4.7%, which was the highest among dairy buffaloes of the world, and it reached 20.2 million head during 1995-96 (Economic Survey 1995-96). In Pakistan, the buffalo contributes 71% of the milk and 50% of the beef production (Shah 1991). It also provides draught and traction power for agriculture and transportation in rural and urban areas of the country. The buffalo population is scattered in herds of various sizes ranging from one head to several hundred. Performance of buffaloes kept under conventional farming system in the North-West Frontier Province of Pakistan was reported in Qureshi 1994.

A number of factors affect the health and production of our livestock. One of these is the parasitic load, which is the cause of great economical loss to the livestock industry. Several studies (Sarwar, 1986; Chaudhry and Khan, 1978) reported that the livestock industry in Pakistan with special reference to buffaloes was suffering serious economic losses due to gastro-intestinal (GI) nematode infestations. This study was thus planned to determine the incidence and intensity of naturally occurring gastro-intestinal nematode infestation and to evaluate efficacy of anthelmintics, albendazole vs levamisole HCL, against these nematodes in buffaloes in the district of Charsaddah in the North-Western Valley of Pakistan.

MATERIALS AND METHODS

The experiment was continued over a period of five months (from October to February). Faecal samples were examined from a total of 500 male and female adult buffaloes for incidence of gastro-

intestinal nematode in Charsaddah District in the North-Western Valley of Pakistan. A minimum of 100 samples each month were collected and examined for nematode infestation. Fresh faecal samples were collected per rectum in pre-labelled polyethylene bags and 30 ml of 5% formalin was added. The samples were examined according to Soulsby (1982); 3 g of sample was triturated in a mortar, 42 ml saturated salt solution was added, the mixture was passed through muslin cloth, put into McMaster chamber of 0.15 ml using a pasture pipette, and examined under a microscope. The number of eggs per gram (EPG) was calculated.

Thirty buffaloes positive for nematodes were divided into three equal groups and treated (7.5 mg/kg B.Wt.) with albendazole (A), levamisole HCL (B) or untreated (C). Fecal samples were examined two days prior to and then on days 1, 4, 7 and 14 of treatment. The efficacy of the drug was estimated as follows:

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

where a = EPG pre medication
b = EPG post medication

$$\text{Efficacy of albendazole} = \frac{1520-60 \times 100}{1520} = 96\%$$

$$\text{levamisole HC1} = \frac{1520-30 \times 100}{1520} = 98\%$$

The data were analyzed using categorical data analysis in SAS packages (SAS 1988).

RESULTS AND DISCUSSION

Out of 500 faecal samples examined, 233 were infected (46.6%) with one or more nematode species of the above kinds. Relative incidence of various species is shown in Table 1. These results indicated a wide range of infestation among the recorded nematode species. *Trichostrongylus* was found to be the most common in buffaloes. The incidence of *Trichostrongylus* was 23.40%, followed by *Oesophagostomum*, 18.91%, *Haemonchus*, 13.80%; *Neoscaris*, 13.14%; *Ostertagia*, 9.61%; *Bunostomum*, 6.41%; *Strongyloides*, 6.09% and *Mecistocirrus*, 5.12%. *Trichuris* was the least common parasite with an incidence of 3.52%.

The incidence reported by several other studies (Mourad *et al.*, 1985; Brokacoty *et al.*, 1984; Masud and Majid, 1984; Ahmad, 1972) were 53%, 54%, 51.72% and 55% respectively. Hussain (1985) and Dario *et al.* (1975) recorded 76.7% and 64.9% infections, which were higher than the present findings. Variations in nematode infections may be attributed to differences in physiological status, age, species of animal, climatic conditions, and farm management practices.

Table 2 shows that the prevalence of *Trichostrongylus* was apparently higher than that of *Oesophagostomum* but was significantly ($P < 0.01$) higher than other kinds of species. The incidence of *Oesophagostomum* (18.91%) was about five percentage units higher than *Haemonchus* and *Neoscaris* (13.47%, on the average) but this was significantly ($P < 0.1$) higher than the occurrence of *Ostertagia*, *Bunostomum*, *Strongyloides*, *Mecistocirrus* and *Trichuris*. The rate of *Ostertagia* was about 4 percentage units lower than *Haemonchus* and *Neoscaris* but about 3.36 percentage units higher than *Bunostomum* and *Strongyloides*. Relatively lower incidences of infections were detected in the study area for *Bunostomum*, *Strongyloides*, *Mecistocirrus* and *Trichuris*. The prevalences among these species were not different (Table 2).

Variations in the incidence of infections due to sex is presented in Table 1. Chi-square analysis revealed that the highest rates of infection found were from *Oesophagostomum* in male (25%) and from *Trichostrongylus* in female (24.60%) animals. Least common were *Trichuris* in female (2.77%) and *Mecistocirrus* (5%) in male animals. The incidence of infection was higher ($P < 0.05$) in male as compared to female buffaloes. These results conform with Tawfic (1987) and Hussain (1985), who also observed higher incidence in male animals. The variations in the occurrence of gastrointestinal parasites due to sex might be attributed to negligence and improper care of male animals.

Chemotherapeutic trial

Data on the efficacy of albendazole and levamisole HCL against gastro-intestinal nematodes in buffaloes are shown in Table 3. There was a significant ($P < 0.1$) decrease in EPG of the animals in Groups A and B as compared to Group C. The efficacy of the albendazole and levamisole,

was not different. Moreover, both drugs showed similar rates of reduction in post-treatment eggs per gram faeces.

Both drugs were found effective in the treatment of gastro-intestinal nematodes in local buffaloes. No side effects were noticed in the experimental animals to whom the medicines were administered. The efficacies of albendazole and levamisole were 96% and 98%, respectively. The results of the present study concurred with Khan (1982) and Nielson (1983).

Rubin and Hibler (1968), Lyons (1981), Manual and Rugay (1979) and Anderson (1977) tested the anthelmintic efficacy of levamisole HCL oral as 60%, 85%, 88%, and 81%, respectively. The differences might have been due to types of infections (simple or mixed infection), geographical conditions, different species of parasites, artificial and / or natural infection and types of experimental animals. Infection of gastro-intestinal nematodes is prevalent in the adult buffaloes of Charsaddah District. Type of infection screened in the study area, was based on a large spectrum of nine genera of nematodes. Both albendazole and levamisole were equally effective to control this infection under local conditions. More work is needed in other seasons of year to schedule epidemiologic approach to the control of gastro-intestinal nematodes of buffaloes/ cattle in Charsaddah District.

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Table 1. Relative incidence of nematodes in male and female buffaloes

Species	Incidence in male	Incidence in female	Total	Percent in male	Percent in female	Total
<i>Bunostomum</i>	6	14	20	10.0	5.5	6.4
<i>Haemonchus</i>	11	32	43	18.3	12.7	13.8*
<i>Mecistocirrus</i>	3	13	16	5.0	5.2	5.1
<i>Neosascaris</i>	6	35	41	10.0	13.9	13.1
<i>Oesophagostomum</i>	15	44	59	25.0	17.5	18.9*
<i>Ostertagia</i>	2	28	30	3.3	11.1	9.6
<i>Strongyloides</i>	2	17	19	3.3	6.7	6.1
<i>Trichostragylus</i>	11	62	73	18.3	24.6	23.4
<i>Trichuris</i>	4	7	11	6.8	2.8	3.6
Total	60	252	312	100.0	100.0	100.0

*Incidence across the sex is different at $P < 0.05$

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SOCIO-ECONOMICS

S.K. Chauhan, R.K. Sharma and Monika Gupta. Himachal Pradesh Krishi Vishwa Vidyalaya, Palampur, Himachal Pradesh 176 062. **Economic losses due to diseases and constraints for dairy development in Kangra district of Himachal Pradesh.** *Indian Journal of Animal Sciences* (1994)64(1): 61-65.

The study was carried out during 1990-91

mainly to examine the economic losses and constraints for dairy development following a multi-stage random-sampling technique. The analysis of data collected from 100 dairy farmers (61 small, 25 medium and 14 large) through personal interview method revealed that percentage of mortality increased due to increase in dairy herd size because of close contact of animals; in respect of morbidity no specific relationship was realised. The economic losses due to mortality and morbidity

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