

## EPIDEMIOLOGY OF PARASITIC LOAD AND THERAPEUTIC CONTROL AGAINST ECTO AND ENDOPARASITES WITH IVERMECTIN IN HORSES

RUBINA HASSAN, MUHAMMAD ATHAR KHAN, TANVEER AKHTAR,  
IHTASHAM KHAN, TARIQ ABBAS AND MUHAMMAD YOUNUS

*Department of Preventive Medicine and Public Health, University of Veterinary & Animal Sciences, 5400-Lahore (MAK, IK, TA); Department of Zoology, University of the Punjab, Quaid-e-Azam Campus, Lahore-54590 (TA); Department of Veterinary Clinical Medicine and Surgery, University of Veterinary & Animal Sciences, Lahore-5400 (RH), Pakistan.*

**Abstract:** The present research project was designed to study the efficacy of ivermectin *i.e.*, LG EUVECTIN inj. against ectoparasites, endoparasites and blood parasites in horses. For this purpose, apparently healthy, weak, emaciated horses showing the clinical signs of parasitism, brought to Outdoor clinics. University of Veterinary & Animal Sciences, Lahore and Society for Prevention of Cruelty to Animals (SPCA) were checked: Out of these 84 animals 25 (29.76%) were found positive for, ectoparasites through the skin scraping examination under the microscope. From these 84 animals 28 were checked for endoparasites and through the coprological examination 25 (89.29%) were found positive. From 84 horses, 5 (5.95%) Horses had mixed type of infection *i.e.*, positive for both ecto and endoparasites. Ectoparasites found in 25 positive cases were mites (29.76%) and no ticks or lice infestation was found. The endoparasites found were mainly the GIT nematodes (round worms) *i.e.*, 25 (89.29%) cases were positive for round worms while 2 (7.14%) cases out of these 25 were also infested with tapeworms and liver flukes were zero percent.

**Key words:** Epidemiology, ectoparasites, endoparasites, ivermectin and horses.

### INTRODUCTION

Parasitic infestations are the major veterinary problems in most of the developed and under-developed countries of the world. Some parasitic infestations even cause death when the control measures are neglected (Hayat *et al.*, 1987) and it is very important to take care of horses in investigating their parasitic diseases and to find the best possible control measures, due to their above-mentioned inevitable role in daily life. The endoparasites are active bloodsuckers. The most characteristic signs are anemia, weakness, emaciation, sometimes colic and diarrhea. The most common gastrointestinal nematodes in equines are *Strongylus vulgaris*, *S. edentatus*, *Parascaris*

*equorum*, *Strongyloides westeri*, *Trichostrongylus axei*, *Gastrophilus intestinalis*, *G. nasalis* and *Oxyuris equi* (John and Greaterx, 1975). Protozoan are also responsible for different diseases in equines (Soulsby, 1982) GIT nematodes especially Strongyles are active bloodsuckers. The intestinal mucosa is damaged where the worms attack and siphon blood. *S. vulgaris* is of special importance because of damage done to the mesenteric arteries and causing verminous colic (Blood and Henderson, 1979). The ectoparasites are also a major problem in equine. These parasitic infestations are found at alarming and noxious level and have been considered highly responsible for substantial economic losses (Hourrigan, 1979). Ectoparasites include ticks, lice, flies, mange and mites. The characteristic symptoms are local inflammation, itchiness, loss of hair, loss of body weight, dull body coat, anemia, damage to the skin, exudation of serum and crust formation due to accumulation of serum exudate. Death takes place in neglected and untreated animals (Manurung *et al.*, 1986).

The efficacy of ivermectin against equine parasites is well established (Hameed, 1997). Thus, ivermectin is used as an effective anthelmintic worldwide. In USA it is mostly recommended orally in paste form. This project was planned to evaluate the efficacy of ivermectin against ecto and endo-parasites in equines in subcutaneous injection form (Hameed *et al.*, 1997). The objectives were to correlate the epidemiological factors and health parameters with parasitized and non-parasitized horses, to find out the prevalence of different ectoparasites and endoparasites in horses as well as Trypanosomiasis in horses, to estimate the parasitic load of ectoparasites, endoparasites and trypanosomes in horses and to determine the efficacy of Ivermectin against ectoparasites, endoparasites and protozoan parasites in horses.

## MATERIALS AND METHODS

The present research was designed to study the efficacy of ivermectin *i.e.*, LG Euvectin inj. against ectoparasites, endoparasites and blood parasite in horses. Apparently healthy, weak and emaciated horses showing the clinical signs of parasitism brought to Outdoor clinics, University of Veterinary & Animal Sciences, Lahore and Society for Prevention of Cruelty to Animals (SPCA). Experimental animals groups were divided into following groups:

Group-I had 25 animals infested with ectoparasites and treated with Ivermectin.  
Group-II: Control of group-I, had 5 untreated animals positive for ectoparasites.

Group-III had 25 animals infested with endoparasites and treated with ivermectin. Group-IV: Control of group-III, had 5 untreated animals positive for endo-parasites. Group- V: had 10 non-infected but treated animals as a control to all groups. Group- VI: Fifty animals were bleed which were all found negative for blood protozoans. LG EUVECTIN injections (Ivermectin 1.0% w/v) a subcutaneous injection of Etivectin was given at dosage rate of 1 ml/50 kg (0.2 mg/kg) body weight once. Epidemiological factors and health parameters of parasitized as well as non-parasitized horses were recorded. Clinically suspected horses were selected for skin scraping examination (Soulsby, 1982). Group-I: (25 Horses) LG Euvectin injection (1.0% w/v ivermectin) on day zero, a subcutaneous injection of Euvectin was given at dosage rate of 1ml/50 kg (0.2 mg/kg) body weight once. Group-II: (5 Horses) this group was taken as untreated control group so did not inject with the Euvectin injection. On the 7th day post-medication and 14th day post-medication, all the animals of both groups were examined for the presence or absence of ectoparasites through skin scraping techniques (Soulsby, 1982). In group-III & IV (endoparasites) infested horses were obtained, which were clinically suspected for gastro-intestinal parasites infestation and were not dewormed recently. The faecal samples were examined for the presence of ova by direct smear method and salt flotation method (Soulsby, 1982). The samples found positive for GIT parasites were subjected to McMaster eggs counting technique (Soulsby, 1982) for detecting the number of eggs per gram (EPG) of faeces.

Group-III (25 Horses) LG Euvectin injection (1.0% w/v ivermectin) on day zero, a subcutaneous injection of Euvectin was given at dosage rate of 1 ml/50 kg (0.2mg/kg) body weight once. Group-IV: (5 Horses) this group was taken as untreated control group so did not inject with Euvectin injection. Group-V: had 10 non-infected but treated animals as a control to all groups. Percent efficacy was calculated. Group-VI: Fifty animals were bleed to check for any positive case for blood.

## RESULTS AND DISCUSSION

Out of 84 animals 25 (29.76%) for ectoparasites through skin scrapping examination under microscope. From these 84 animals 28 were checked for endoparasites and through carpological 25 (89.29%) were found positive. From 84 horses, 5 (5.95%) horses had mixed type of infection *i.e.*, positive for both ecto and endoparasites. Ectoparasites found in 25 positive cases were mites (29.76%) and no ticks or lice

infestation was found *i.e.*, zero percent prevalence. The endoparasites found were mainly in the GIT nematodes (round worms) *i.e.*, 25 cases were positive for round worms, while 2 (7.14%) cases out of these 25 were also infested with tapeworms and liver flukes were zero percent. Endoparasites observed in this project were mainly *Strongylus*, *Parascaris quorum* and *Gastrodiscus*. The results are in agreement with Lyons *et al.* (2006) who studied prevalence of various gastrointestinal parasites in horses. The findings also agree with Kuzmina *et al.* (2005) who described intestinal nematodes as the most dominant metazoan population. Ectoparasites were only mites (species identification was not done) and no lice or ticks were observed (Table 1).

**Table 1: Prevalence of ectoparasites and endoparasites in horses**

Parasite	Total No. of Horses	Number	Percentage
Ectoparasites	84	25	29.76
Endoparasites	28	25	89.29
Ectoparasites + endoparasites	84	5	5.95
Blood protozoan	50	0	0

**Efficacy of ivermectin against endoparasites in parasitized horses**

Ectoparasites	Total No. of animals examined	Parasitized & treated animals		Recovery rate after treatment with ivermectin				Total recovery rate in horses	
		No.	%	Day 7	Day 14	No. Recovered	%age		
Ticks	84	0	0	0	0	0	0	0	0
Li'ce	84	0	0	0	0	0	0	0	0
Mites	84	25	29.76	6	24	19	76	19	76
Nematodes (Round worms)	28	25	89.29	17	68	22	88	22	88
Tape Worms	28	2	7.14	0	0	0	0	0	0
Liver Flukes	28	0	0	0	0	0	0	0	0

Infected horses were treated with LG Euvemctin Inj. (Ivennectin 1.0% W/V) through subcutaneous route at dose rate of 1 ml/50 Kg (0.2 mg/Kg) body weight once on zero days. An egg per 9 gram of faeces (EPG) was counted on zero day, day 7 and day 14. Recovery rate with Tvermectin against ectoparasites and endoparasites was 76% and

88% respectively. A total of 50 horses were bleed for blood parasites, none of them were found positive. Percent efficacy of Ivermectin against roundworms was 69.23% and 100% on day 7 and day 14 respectively. But it is efficacy against tapeworms zero percent.

Among the ectoparasites the prevalence of mites was 29.76% and this is in line with the findings of Bhasker and Joseph (1988), who described mange as the most important parasitic disease in equines in India. The prevalence of ticks was zero percent. This could be due to seasonal variation. Borges *et al.* (2000) described the seasonal dynamics in tick infestation rate in free-living horses.

Among the endoparasites the nematodes were seen in most of the horses studied. Boxell *et al.* (2003) studied occurrence of gastrointestinal parasites in horses in metropolitan Perth, Western Australia. The nematodes were found in most of the horses. The results of present study are also in agreement with Hayat *et al.* (1987) who described nematodes as principal gastro-intestinal worms. Among the nematodes infection, the *Strongylus* and *Parascaris* were more prevalent. Lyons *et al.* (1981) studied the prevalence of *S. vulgaris* and *P. quorum* in thorough bred horses and revealed that 39% horses were having the *S. vulgaris*. Chaudhry *et al.* (1991) examined fresh faecal samples from 200 horses in Faisalabad, Pakistan. Prevalence of *Strongylus* was found to be 40% in horses. The difference in the incidence may be due to climate, environmental factors, grazing pattern of the animals and number of animals examined. This may also vary with the age and sex of the animals.

The prevalence of blood protozoan was found zero percent in this study and no reference was observed about the incidence of blood parasites in horses specially *Trypanosoma evanse*.

The present study revealed 76% efficacy of Ivermectin against ectoparasites and this resembles to the study of Littlewood *et al.* (1995) studied efficacy of oral Ivermectin paste (0.1 mg/kg daily for 7 days) for the treatment of Chorioptic mange in 24 horses. There was a statistically significant reduction in the numbers of mites in treated horses. The average egg per gram (EPG) of faeces of round worms was 742, which were reduced to 228.33 at 7th day and to zero at 14th day. An average egg per gram (EPG) of faeces of tapeworms, was 225 at day zero which remains the same up till day 14. And these results are in resemblance to the study of Matthee *et al.* (2004) who studied effects of Ivermectin treatment on EPG and reported significant reduction in the treated horses. Marley *et al.* (2004) studied antiparasitic activity of an Ivermectin and praziquantel combination paste ill horses and showed that a combination product containing Ivermectin and praziquantel allowed efficacious treatment of horses for nematode, cestode and hot infections (Barret *et al.*, 2004). Field trial of the efficacy of a combination of Ivermectin-praziquantel in horses infected with roundworms and tapeworms. The treatment suppressed the median FEC of the horses to zero for 10 weeks (Ikeda, 2003). Pharmacological effects of

Ivermectin, an antiparasitic agent for intestinal Strongyloidiasis: its mode of action and clinical efficacy. Anthelmintic effects were reported also in dogs, horses, and humans infected with Strongyloides. 99% and 96% reduction was recorded for pyrantel pamoate and ivermectin, respectively.

Love *et al.* (1995) conducted a study in which he found that Ivermectin was 99% effective against non-inhibited larval stages developing within the mucosa. Paulrud *et al.* (1997) checked out the field efficacy of Ivermectin injection on faecal *Strongylus* egg output of Icelandic horses. The results showed that Ivermectin injection produces a lower suppression of faecal Strongyle egg output than oral Ivermectin paste. Klei *et al.* (1993) studied the efficacy of a high dose of Ivermectin.

The efficacy of Ivermectin against GIT nematodes was 88% .It is noticed that Ivermectin treatment was highly effective against all nematode parasites in horses. Munoz *et al.* (1994) published a report on the results of a trial on the efficacy of subcutaneously administered Ivermectin, which resulted into 81. % recovery. Visser *et al.* (2001) described that two trials were conducted to confirm the efficacy of Ivermectin paste against endoparasites of horses. Ivermectin oral paste at the dose rate of 200mg /kg body weight once on day 0, was administered in these trials. The data revealed that Ivermectin is highly effectively for the treatment and control of a broad range of small and large *Strongyle* species as well as other species of gastrointestinal parasites.

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