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PREVALENCE AND ANTHELMINTIC EFFICACY OF ABAMECTIN AGAINST GASTROINTESTINAL PARASITES IN HORSES

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ABSTRACT

The prevalence and anthelmintic efficacy of Abamectin against gastrointestinal parasites under field conditions in Faisalabad (Punjab, Pakistan) was studied in 100 horses. The overall prevalence of gastrointestinal parasites was 75%, including *Strongylus spp*. (50%), *Oxyuris equi* (12%), *Parascaris equorum* (8%) and mixed infection (5%). Among these naturally infected animals, 15 were selected. These horses were assigned to three groups on the basis of prevalent species of gastrointestinal parasites. Each group had five animals, comprising four treatment horses and a control horse. Abamectin was evaluated against these gastrointestinal parasites with a single shot at the dose rate of 0.2 mg/kg body weight administered through subcutaneous route which resulted in 98% reduction in faecal egg count after day 14 post-treatment. Non-treated horses remained positive for gastrointestinal parasites. No adverse reactions were observed during the experimental period. It was concluded that Abamectin is highly effective against gastrointestinal parasites in horses.

Key words: Prevalence, gastrointestinal parasites, horses, efficacy, Abamectin.

INTRODUCTION

Parasitic diseases are the major obstacle in the growth and development of animal health. Incidence of clinical and sub-clinical diseases of horses can be minimized through controlling the gastrointestinal parasites (Sattar, 2003). There are various approaches to achieve this goal, but traditionally, control has relied on regular treatment with anthelmintic drugs (Meara and Mulcahy, 2002).

Abamectin is derived from *Streptomyces avermitilis* and has potent antiparasitic activity (Echeverria *et al*., 2001). This compound has shown excellent antiparasitic activity against a wide range of gastrointestinal parasites of equines (Bennett, 1986). A variety of adverse reactions have been reported in horses after parentral administration of Abamectin at the recommended dose of 0.2 mg/kg body weight (Leaning, 1983; Reed, 1983). These reactions have occurred in a small percentage of treated horses and the drug is now sold as a paste for oral administration.

Abamectin at a dose rate of 0.2 mg/kg body weight is currently used by many horse owners, who are claiming excellent results without any adverse sideeffects. The aim of the present study was to determine the prevalence of gastrointestinal parasites in horses in and around Faisalabad and to study the anthelmintic efficacy of Abamectin injected subcutaneously against gastrointestinal parasites.

MATERIALS AND METHODS

Animals

One hundred horses were studied for the prevalence of gastrointestinal parasites from different localities in and around Faisalabad (Punjab, Pakistan). Intestinal contents were taken for counting and identifying species of gastrointestinal parasites. Infections were confirmed before the beginning of the treatment by direct smear and flotation technique. After treatment, experimental animals were penned by treatment groups until the end of the observational period.

Design of study

Fifteen horses positive for gastrointestinal parasites were randomly assigned to three groups based on the species of the prevalent gastrointestinal parasites i.e. *Strongylus spp*. (group-I), *Oxyuris equi* (group-II) and *Parascaris equorum* (group-III). Each group had five horses, with four treatment and one control. Treatment groups of horses were administered a single shot of Abamectin (Abamec®; Selmore Agencies Pvt.) at the dose rate of 0.2 mg/kg body weight through subcutaneous route, while horses of control groups were kept untreated. Treated horses were observed for possible adverse reactions for 2 hours after injection. General body conditions of all treated animals were observed throughout the study period regarding to clinical signs i.e. soundness, irritation, depression, feed intake and faecal appearance. Faecal egg counts were performed for all animals on days 0, 3, 7 and 14 post-treatment.

Detection of parasites in faeces

Faecal samples of all horses were collected and analyzed by using McMaster technique (Soulsby, 1982). After that, parasites were identified on the basis

of classifications described by Noda (1979), Georgi and Georgi (1990) and Lichtenfels *et al.* (1998).

Data analysis

Anthelmintic efficacy was calculated by the faecal egg count reduction (FECR) test (Coles *et al.*, 1992) according to the following formula:

$$\text{FECR (\%)} = \frac{\text{Pre-treatment EPG - Post-treatment EPG}}{\text{Pretreatment EPG}} \times 100$$

RESULTS AND DISCUSSION

Prevalence of GIT parasites

Out of 100 horses, 75 animals were positive for the gastrointestinal parasitic infection, indicating that the prevalence was 75%. Species wise prevalence was 50, 12, 8 and 5% for *Strongylus spp*., *Oxyuris equi*, *Parascaris equorum* and mixed infection, respectively. These results are in accordance with Hutchison and Mfitlidoze (1989), who reported that 80% horses in the Australian subcontinent were infected with gastro-intestinal parasitism.

Faecal egg count reductions

All horses of the treatment groups were positive for GIT parasites with the mean eggs per gram (EPG) value on day zero was 1553.75. This decreased to 450, 112.5 and 20.25 on 3, 7 and 14 days post-treatment, respectively (Table 1). The efficacy of Abamectin at the dose rate of 0.2 mg/kg body weight was 71.04, 92.75 and 98.69% on the day 3, 7 and 14 of treatment. However, all horses of the control groups were found positive for gastrointestinal parasitism, with mean EPG value of 1522.5 at the start of trial that increased to 1586.25, 1687.5 and 1792.5 at day 3, 7 and 14 post-trial (Table 2). In this study, more than 98% reduction in faecal egg count was observed after 14 days of administering Abamectin subcutaneously. Trobert *et al*. (1982) reported that after treatment of six horses with Ivermectin products at 0.2 mg/kg body weight, neither *Strongylus* nor *P. equorum* eggs were found in the faecal samples on post-treatment day 7. Our findings did not coincide with these results because of the huge gastrointestinal parasitic burden just before the treatment.

Our results agree with the findings of Itagaki *et al*. (1993) and Yoshihara *et al*. (1994), that a wide range of species of parasites were observed, with the exception of small *Strongylus*. The results are also comparable with the findings of Adquith and Kivipelto (1987). They treated 120 parasitic infected horses and ponies with Ivermectin at dose rate of 1ml/50 kg (0.2 mg/kg) body weight. The EPG count in treated animals was reduced to almost zero on day 14 post-medication. Dipietro *et al*. (1982) and Klei *et al*. (1993) reported the potent anthelmintic efficacy of Ivermectin against these parasites at dosage of 200µg/kg b.wt. In this regard, our study has confirmed that Abamectin has excellent anthelmintic efficacy against many species of GIT parasites.

Table 1: Efficacy of Abamectin against gastrointestinal parasites of horses

	Reduction in EPG after treatment			
Parasite	**Day 0**	**Day 3**	**Day 7**	**Day 14**
Strongylus	1850	460(75.13)	90(95.13)	15(99.18)
Oxyuris equi	925	285(69.19)	65(89.12)	12(98.70)
Parascaris equorum	780	290(62.82)	80(89.74)	19(97.56)
Strongylus + Oxyuris equi	2660	765(71.24)	215(91.92)	35(98.68)
Mean	1553.75	450(71.04)	112.5(92.75)	20.25(98.69)

Figures in parentheses indicate reduction (%) in EPG.

Table 2: Mean eggs per gram (EPG) of faeces in untreated group of horses

	Mean EPG on different days			
Parasite	**Day 0**	**Day 3**	**Day 7**	**Day 14**
Strongylus	1740	1845	1925	1990
Oxyuris equi	885	950	1025	1180
Parascaris equorum	790	830	945	1035
Strongylus + Oxyuris equi	2675	2720	2855	2965
Mean	1522.5	1586.25(4.02)	1687.5(9.78)	1792.5(15.06)

Figures in parentheses indicate percent increase in EPG.

General clinical conditions

No abnormalities were observed in physical conditions such as soundness, appetite and faecal appearance in any of the treated horse during 14 days post-treatment period. Davies *et al*. (2000) reported that animals medicated with Ivermectin showed no adverse effects, except a minor type of local reaction in the form of swelling at the site of injection, which sub-sided within a short period after the injection. But no swelling was observed in our study after injecting Abamectin subcutaneously in any of the animal due to the use of Abamectin instead of Ivermectin.

Conclusion

This study showed that a single subcutaneous injection of Abamectin administered at dose rate of 0.2 mg/kg body weight was highly effective against gastrointestinal parasites in horses.

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