Wayamba Journal of Animal Science – ISSN: 2012-578X; P128 - P130, 2011
First Submitted August 01, 2011; Number 1312874490

PERSISTENT EFFECT OF ANTHELMINTICS IN NATURALLY INFECTED DONKEYS (*Equus acinus)*

Parsani, H. R.[1], Momin, R.R.[2] , Lateef, A.[3] and Hemen, Das[4]
[1]Dept. of Parasitology, [2]RADIC, [3]Dept. of Animal physiology & Biochemistry, [4]Dept. of Animal physiology & Biochemistry, College of Veterinary Science & Animal Husbandry, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Dantiwada-385506, Gujarat, India

In the present study, preliminary faecal examination was carried out to select donkeys having egg ≥500, which were subsequently divided randomly into three groups having at least 30 animals in each group. The group- l comprised of 30 animals was treated with fenbandazole @10 mg/kg b. wt. orally. The group-2 comprised of 40 animals was treated with ivermectin @ 0.2 mg/kg b.wt. subcutaneously and group-3 of 30 animals was kept as 'untreated control'. EPG of individual animals was calculated using Modified McMaster counting technique at '0'day of treatment and then after a lapse of two weeks until the arithmetic mean EPG of that particular group reached to or above 200. Persistent effect of different anthelmintic drugs *viz.* fenbendazole and ivermectin was evaluated at two weeks interval. The duration of protection of both the drug was same upto six weeks; whereas, persistent effect varied from six weeks to twelve weeks in both the drugs.

Key Words: Persistent effect, fenbendazole, ivermectin, helminth infection, donkey.

Donkeys contribute immensely in the overall economic development of developing country especially in rural and hilly areas. In spite of paramount economic importance, due attention has not been paid to conserve Indian breeds of donkeys and to upgrade them by undertaking breeding programmes and health management. Even today the stoic, hardworking donkey is often misunderstood by its owner and unfortunately often by the veterinarians worldwide. In equids, the most tedious and harassing job in health management is control of parasitic diseases and specifically the strongyle infection (Duncan, 1985). Different parasitic control programme have failed to attain the desired target, because of little knowledge about selection of drug of choice, number of treatments, timing of administration, lack of knowledge regarding population dynamics and generation time of the parasites. Parasite control through anthelmintic treatment is a routine practice and integral part of herd health management. The frequency of treatment varies from clinician to clinician and no definite schedule exists in India. Traditional programme that depend on reported use of anthelmintic compounds throughout the year and over years are unsuitable and shou1d no longer be recommended. A concept of duration of protection thus came to existence. Based on this concept, the animals are treated only when they become a potential source of pasture contamination with helminth eggs/larvae (Borgsteede et al., 1993; Kivipelto and Asquith, 1994; Boersema et al., 1991 and 1996 and Mercier et al., 2001). This helps in reducing the frequency of treatment and thus has double benefit like decrease in treatment cost and slowing down the emergence of drug resistance. Persistent effect of an anthelmintic is defined as the duration between first treatment and the reappearance of parasitic eggs in faeces in an appropriate quantity, which warrants for next treatment. This is also known as egg reappearance period (ERP). The present work was therefore undertaken to determine the duration of protection of two anthelmintics (fenbendazole and ivermectin) and to

measure the time required between two consecutive treatments. The interval of eggs reappearance period (ERP) being defined as the period after treatment during which the output of egg is negligible or considered as acceptable, until a fixed threshold beyond which animals should be treated (Mercier et al., 2001).

MATERIALS AND METHODS

For the investigation of protection period or egg reappearance period (ERP) by anthelmintics against donkey strongyles of North Gujarat, preliminary faecal examination was carried out to select the animals having EPG (Eggs per gram of faeces) ≥500 and randomly divided into three groups having at least 30 animals in each group. The group-l of 30 animals was treated with fenbendazole @ 10 mg/kg b.wt. orally. The group-2 of 40 animals was treated with ivermectin @ 0.2 mg/kg b.wt. subcutaneously and group-3 of 30 animals was kept as untreated control. EPG of individual animals was calculated using Modified McMaster counting technique at '0' day of treatment and then after a lapse of two weeks until the arithmetic mean EPG of that particular group reached to or above 200 (Rolfe et al.,1998; Mercier et al., 2001). EPG of the control group was also estimated to check any significant change.

RESULTS AND DISCUSSION

Data of the persistent effect of different drugs *viz.* fenbendazole and ivermectin evaluated at two weeks interval have been presented in Table-1. In the present study highest protection period for up to six weeks was provided by both the anthelmintics, but the persistent effect varied from six to twelve weeks in both the drugs. Very short protection period of fenbendazole and ivermectin has already been recorded from Netherlands (Eysker et al., 1992) and Britain (Rolfe et al., 1998). Age of animal, larval inhibition and high pasture contamination has been attributed as the factors responsible for such short protection period (Eysker et al., 1992 and Rolfe et al., 1998). The short protection period of both the anthelmintics in the current study may be attributed to high stocking rate per unit area of grazing land resulting into high pasture larval burden (Eysker et al., 1992). Another factor may be the hypobiotic larvae against which most of the anthelmintics have little efficacy (Rolfe et al., 1998).

Table-1 Mean EPG in donkeys treated with different anthelmintics for their persistent effect

Sr. No.	Anthelmintic drug	Group	WEEKS AFTER TREATMENT (epg)						
			0	2	4	6	8	10	12
1.	Fenbendazole	I	995	40	85	115	205	395	440
2.	Ivermectin	II	895	40	75	135	205	315	355
3	Control	III	800	850	850	835	795	820	860

Considering the highest protection period of six weeks, it is clearly indicated that treatment should be initiated after 40 to 50 days. It is in contrary to the finding of Lumsden et al. (1989) and Rolfe et a1. (1998), who had reported protection period of fenbendazole as 13 to 14 days only. This difference might be due to the inclusion of those animals in their study who have been treated with benzimidazole for long time, leading to selection of worm population having shorter ERP by this drug as suggested by Herd and Gabel (1990) indicating that re-treatment should be initiated keeping in mind the stocking rate and the climatic conditions prevailing in the area (Lind et al., 1999).

REFERENCES

1. Boersema, J.H.; Borgsteede, F.H.M.; Eysker, M.; Elema, T.E.; Gaesenbeek, C.P.H. and Vander Burg, W.P.J. (199]). The prevalence of anthelmintic resistance of horse strongyles in the Netherlands. *Vel. Quart.,* 13 : 209-217.
2. Boersema, J.H.; Eysker, M.M.; Mass, J. and Vander Aar, W.M. (1996). Comparison of the reappearance of strongyle eggs in foals, yearlings and adult horses after treatment with ivermectin or pyrantel. *Vet. Quart.,* 18 : 7-9.

3. Borgsteede, F.H.M.; Boersema, J.H. and Gaasenbeek, C.P.H. (1993). The reappearance of eggs in faeces of horses after treatment with ivermectin. *Vet. Quart.*,15 :24-26.
4. Duncan, J.L. (1985). Internal parasites of the horses and their control. *Equine Vet. .J,* 17 :79-82.
5. Eysker, M.; Boersema, J.H. and Kooyman, F.N.J. (1992). The effect of ivermectin against inhibited early third stage and fourth stage larvae and adult stage of the cyathostomes in Shetland ponies and spontaneous expulsion of these helminthes.*Vet. Parasitol.,* 58 : 99-108.
6. Herd, R.P. and Gabel, A.A. (1990). Reduced efficacy of anthelmintic in young compared with adult horses. *Equine Vet. J.*, 22 : 164-169.
7. Kivipelto, J. and Asquith, R.L. (1994). Duration of fecal egg count reduction for antiparasitic compounds in the young horses. *Equine Pract.,* 16 : 10-14.
8. Lind, O.E.; Hogland, J.; Ljungstrom, B.L.; Nilsson, O. and Uggla, A. (1999). A field survey on the distribution of strongyle infections of horses in Sweden and factors affecting faecal egg counts. *Equine Vet. J,* 31 : 68-72.
9. Lumsden, G.G.; Ouan-Taylor, R.; Smith, S.M. and Washbrook, I.M. (1989). Field efficacy of ivermectin, fenbendazole and pyrantel embonate paste anthelmintics in horses. *Vet. Rec.,* 125 : 497-499.
10. Mercier, P.; Chick, B.; Alves-Branco, F. and White, C.R. (2001). Comparative efficacy,persistent effect and treatment intervals of anthelmintic pastes in naturally infected horses. *Vet. Parasitol.,* 99 : 29-39.
11. Rolfe, P.F.; Dawson, K.L. and Holm-Martin, M. (1998). Efficacy of moxidectin and other anthelmintics against small strongyles in horses. *Aust. Vet.J,* 76:332-334.

