

Therapeutic Efficacy of Closantel Against Different Gastrointestinal Parasites in Sheep

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Abstract

Small ruminants are suffered by many numbers of health issues mainly gastro intestinal parasites. These conditions can be controlled and treated with different chemotherapeutic regimens. The present study was conducted in YSR Kadapa district of Andhra Pradesh in 2016. Thirty sheep were selected randomly from three different flocks and were treated with oral administration of closantel at 10 mg/kg body weight. Before treatment and 1st, 7th, 14th and 21st day of post treatment faecal samples were collected for determination of parasitic intensity by analysis of egg per gram of faeces. Therapeutic efficacy of the drug against different gastro intestinal parasites was carried out by the percentage reduction in the egg per gram levels. It was highly effective against *Strongyloides* spp., *Haemonchus contortus*, *Oesophagostomum* spp., *Trichuris* spp., *Fasciola gigantica* and *Paramphistome* spp.. Reduction in the intensity of parasitic ova was 25.5%, 90.6%, 98.2% and 99.5% by the 1st day, 7th day, 14th day and 21st day of post treatment respectively. In conclusion, higher efficacy of closantel was observed against the different gastro intestinal trematodes and nematodes in the present geographical location.

Keywords: Closantel; Sheep; Gastrointestinal parasites; India

Introduction

Overall and general health status of the small ruminants will be affected by the gastrointestinal parasitic infection in a flock. India has a population of 120 million goats and 62.5 million sheep, besides other livestock [1]. Worldwide essential information on the epidemiological studies of the parasitic diseases in the different geographical regions is essential to monitor the control of these diseases [2]. The severe economic loss because of parasitic infections in sheep might be due to mortality, enhanced susceptibility to other diseases and loss from the cost of the drugs. Among the different endoparasitic infections, haemonchosis and fascioliasis cause severe economic losses in sheep due to anaemia and liver damage respectively [3,4]. The expected annual cost due to parasitic diseases in sheep and cattle has been estimated as ten billions of dollars worldwide [5]. Due to an excessive and frequent utilization of the anthelmintics results in anthelmintic resistance in nematode populations and there is an obvious need for the development of the improved methods to control parasitic diseases. In India, several studies have been conducted to determine the prevalence of gastrointestinal parasites in small ruminants at different parts of the country [6,7]. Literature availability was very limited on the therapeutic effect of closantel in the management of gastrointestinal parasitic infection in sheep in India [8]. Hence, the present study was planned with an aim to record the therapeutic efficacy of closantel against different gastrointestinal parasitic infection in sheep in YSR Kadapa district of Andhra Pradesh.

Materials and Methods

The present study was conducted from September 2015 to April 2016 in YSR district of Andhra Pradesh, India. In this study, thirty

sheep (age between 6 months to 14 months, weighing from 15 to 26 kg) were selected randomly from the three different flocks which had the previous history of diarrhoea. Sheep were treated with oral administration of closantel at 10 mg/kg body weight. Faecal samples were collected from the individual sheep and processed for the different types of parasitic ova. Identification of the different types of parasitic ova was done by morphological confirmation of ova and by copra-culture. Samples were collected before therapy and 1st, 7th, 14th and 21st day of post treatment. Analysis of the faecal samples was done by the direct smear, flotation technique and eggs per gram (EPG) was done by McMaster slide technique [9]. Efficacy of the closantel was estimated by the standard formula that is reduction in faecal egg counts (%) = $100 \times (\text{arithmetic mean number of eggs per gram of faeces in the before treatment}) - (\text{arithmetic mean number of eggs per gram of faeces after treatment}) / (\text{arithmetic mean number of eggs per gram of faeces in the before treatment})$.

Results and Discussion

Therapeutic response to the closantel at different intervals in sheep was mentioned in Table 1 and the percentage efficacy was mentioned in Table 2. By the 7th day of therapy, uneventful reduction in the EPG was noticed in the treated group. Reduction in the intensity of parasitic ova was 25.5%, 90.6%, 98.2% and 99.5% by the 1st day, 7th day, 14th day and 21st day of post treatment. After twenty fours of therapy, 25.5% reduction in the parasitic ova was noticed in sheep and it was highest against the *Haemonchus contortus* (37.8%), *Oesophagostomum* spp. (36.6%), *Trichuris* spp. (36.2%) parasites. 90.6% of the reduction in EPG levels was noticed after the seven days of therapy and it was highest against *Oesophagostomum* spp. (95.1%) and *Haemonchus contortus* (93.3%) parasites. Hundred percent of the reduction in EPG levels noticed against the *Strongyloides* spp., *Trichuris* spp. and *Fasciola gigantica* by the twenty first day of post therapy.

SI.No	Name of the parasitic ova	Before therapy (0 th day)	After therapy			
			1 st day	7 th day	14 th day	21 st day
1	<i>Strongyloides</i> spp.	518	422	42	2	0
2	<i>Haemonchus contortus</i>	524	326	35	9	1
3	<i>Oesophagostomum</i> spp.	492	312	24	8	2
4	<i>Trichuris</i> spp.	98	64	9	0	0
5	<i>Fasciola gigantica</i>	312	308	62	8	0
6	<i>Paramphistome</i> spp.	128	112	21	11	1
	Total	2072	1544	193	38	10

Table 1: Parasitic intensity before and after the therapy with closantel (EPG).

SI.No	Name of the parasitic ova	After therapy			
		1 st day	7 th day	14 th day	21 st day
1	<i>Strongyloides</i> spp.	18.5	91.9	99.6	100
2	<i>Haemonchus contortus</i>	37.8	93.3	98.2	99.8
3	<i>Oesophagostomum</i> spp.	36.6	95.1	98.4	99.6
4	<i>Trichuris</i> spp.	36.2	90.8	100	100
5	<i>Fasciola gigantica</i>	1.2	80.1	97.4	100
6	<i>Paramphistome</i> spp.	4.7	83.6	91.4	99.2
	Total	25.5	90.6	98.2	99.5

Table 2: Efficacy of closantel against the different parasites (%).

Different types of parasitic infections including haemoprotozoans, trematodes, cestodes and nematodes cause severe economic loss to the farmers [10]. Gastrointestinal parasitism leads to lowered protein levels by the loss of protein into the gut and increased gastrointestinal tissue protein metabolism finally had the effect on meat quality. In the present study sheep with the history of diarrhoea was selected to obtain the different types of parasitic ova because, helminths considered as one of the most common causes of diarrhoea in small ruminants in India [11]. Chemotherapy is the best way to treat helminths infection, but due to the indiscriminate use of the drugs, resistance to drugs has developed and it is a major constraint for nematode control throughout the world [12]. Closantel is a salicylanilide molecule it can affect the both nematodes and trematodes. But, development of the resistance varies according to the geographical location and utilization of different dewormers in the field [13]. It is essential to record the more prevalent gastrointestinal parasites in the different geographical locations to select a therapeutic protocol [14]. Closantel will be useful to prevent economic loss caused by parasitic infections in sheep in the present geographical region.

Conclusion

Present communication reports about the efficacy of closantel against common gastro intestinal parasites in sheep in YSR Kadapa

district of Andhra Pradesh. The study concludes that the closantel can be used for control and prevention of parasitic infections in sheep.

Conflict of Interest

The authors declare no conflict of interests in relation to this work.

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References

1. FAO (2006) FAOSTAT. Food and Agriculture Organization, Rome.
2. Gupta A, Dixit AK, Dixit P, Mahajan C (2013) Prevalence of gastrointestinal parasites in small ruminants in and around Jabalpur, India. J Vet Parasitol 27: 59-60.
3. Roeber F, Jex AR, Gasser RB (2013) Impact of gastrointestinal parasitic nematodes of sheep, and the role of advanced molecular tools for exploring epidemiology and drug resistance - an Australian perspective. Parasit Vectors 6:153.
4. Khan SA, Muhammad S, Khan MM, Khan MT (2015) Study on the prevalence and gross pathology of liver fluke infestation in sheep in and around Quetta District, Pakistan. Adv Anim Vet Sci 3: 151-155.
5. Sackett D, Holmes P (2006) Assessing the Economic Cost of Endemic Disease on the Profitability of Australian Beef Cattle and Sheep Producers. Meat and Livestock (MLA) Limited: Sydney.
6. Kumari S, Sinha SRP, Sucheta S, Hoda MZ, Mandal KG, et al. (2010) Incidence of gastrointestinal helminthosis in sheep and goats in Patna (Bihar). J Vet Parasitol 24: 97-99.
7. Sivajothi S, Reddy BS (2014) Immature paramphistomosis in a sheep herd. Int J Biol Res 2: 140-142.
8. Garedaghi Y, Rezaii saber AP, Mameghani S (2011) Efficacy of Closantel 5% against sheep gastrointestinal parasites in East-azerbaijan province Iran. Ann Biol Res 2: 69-74.
9. Soulsby EJJ (1982) Helminths, arthropods and protozoa of domesticated animals, 7th Ed. Bailliere Tindall, London, pp: 579-624, 765-766.
10. Sivajothi S, Rayulu VC, Malakondaiah P, Sreenivasulu D, Reddy BS (2014) Detection of antibodies against Trypanosoma evansi in sheep by indirect ELISA in Rayalaseema region of Andhra Pradesh. J Adv Vet Res 4: 88-92.

11. Sissay MM, Asefa A, Ugglu A, Waller PJ (2006) Anthelmintic resistance of nematode parasites of small ruminants in eastern Ethiopia: exploration of refugia to restore anthelmintic efficacy. *Vet Parasitol* 135: 337-346.
12. Sheferaw D, Asha A (2010) Efficacy of selected anthelmintics against gastrointestinal nematodes of sheep owned by smallholder farmers in Wolaita, Southern Ethiopia. *Ethiop Vet J* 14: 31-38.
13. Easwaran C, Harikrishnan TJ, Raman M (2009) Multiple anthelmintic resistance in GI nematodes in South India. *Vet Arch* 79: 611-620.
14. Sivajothi S, Reddy BS (2015) A Study on the Gastro Intestinal Parasites of Domestic Pigeons in YSR Kadapa District in Andhra Pradesh, India. *J Dairy Vet Anim Res* 2: 00057.