Available online at www.pelagiaresearchlibrary.com

Pelagia Research Library

Advances in Applied Science Research, 2012, 3 (4):2243-2246

ISSN: 0976-8610
CODEN (USA): AASRFC

Seasonal influence on *Haemonchus contortus* infection and response to treatment with albendazole in Yankasa lambs

***[1]Simon M. K., [1]Jegede O. C and [1]Nafarnda W. D**

[1]Department of Veterinary Parasitology and Entomology, Faculty of Veterinary Medicine, University of Abuja, Nigeria
[2]Department of Veterinary Public Health and environmental Management, Faculty of Veterinary Medicine, University of Abuja, Nigeria

---

ABSTRACT

The seasonal influence on Haemonchus contortus infection in lambs and seasonal influence on response to treatment with albendazole was evaluated. Worm free lambs were artificially infected with 10,000 L_3 of Haemonchus contortus in both seasons. Egg output was evaluated before and after treatment in the two seasons. There was no significant difference in the levels of haemonchosis in the lambs for both seasons. However there was a significant difference in egg output between the dry season and wet season after treatment with albendazole. The lower egg output in the dry season may not necessarily be as a result of response to albendazole treatment, other factor such as hyperbosis may have equally contributed. However, repeated deworming in the wet season has been recommended for effective control of haemonchosis.

Keywords: Yankasa lambs, season, *Haemonchus contortus*, treatment, albendazole

---

INTRODUCTION

Helminthosis in small ruminants poses a great limitation to profitable sheep and goat farming in developing countries especially in Africa. Over the years, nematodes parasites of sheep and goat were effectively controlled by the use of anthelmintics. However, indiscriminate use of these anthelmintic drugs has led to the development of resistance in the worm populations [1, 2]. Anthelmintic resistance has now reached such a high level to virtually all available anthelmintics in most small ruminant breeding farms. This is seriously threatening the continuing existence of these industries especially Malaysia [2]. The situation has given rise to the urgent need to investigate alternative methods of worm control. Recent and ongoing studies have included utilizing pasture management system, introduction of breeds that are more resistant to helminthes [3], using low dose medicated urea molasses blocks and most recently investigating the potential for using biological control agents such as nematophagus fungi [2]. *Heamonchus contortus* is the most common gastrointestinal nematode of sheep in Kenya and is responsible for substantial production losses in these animals [4]. The control of this nematode has so far been based on the use of convention anthelmintics. However, resistance of gastrointestinal nematodes to most families of broad-spectrum anthelmintics is now recognized as a problem in several part of the world and the appearance of species and strains of sheep parasites with resistance to benzimidazole anthelmintics has increasingly been reported worldwide [5]. Although the range of activity of members of the benzimidazole anthelmintics varies mainly through differences in their pharmacokinetic behavior, as such resistance to one benzimidazole anthelmintics is accompanied by resistance to other members of the group [6]. Recently, *Haemonchus Contortus* strains which are resistant to benzimidazole anthelmintics in sheep and goats in Kenya have been reported [5]. This suggests that there is a need for an alternative anthelmintic with a different mode of action. This study is therefore aimed at assessing the seasonal influence on *Haemonchus contortus* infection in lambs and seasonal influence on response to treatment with albendazole.

MATERIALS AND METHODS

Study Animals

Twelve (12) Yankasa lambs were bought at Wawa market Kainji Niger state Nigeria and were routinely treated with ivermectin and 10 % Oxytetracycline and allowed to acclimatize for two weeks in two pens of six animals each. Feed and water were supplied ad-libitum.

Helminths Parasite

Adult female *H. contortus* were obtained from the abomasum of sheep slaughtered at the Kainji abattoir in Niger State. The abomasums were removed soon after evisceration and transported to the laboratory. Thereafter, they were opened along the greater curvature and their content emptied into a 4-litre plastic bucket containing 2 litres of water. The parasites were recovered by passing the content through a sieve of 100 µm diameter mesh and were picked with wire loop with the aid of an illuminator (Picker X-ray Cooperation NY. USA). Female *Haemonchus contortus* were identified and separated from other parasites [7]. The female parasites were crushed in a mortar to obtain the eggs. The eggs together with the vermiculite were incubated at 27 ^oC (Shermond, ILCA, N1742, England) for 10 days; after which the infective larvae (L_3) were harvested using modified Baerman's apparatus [8].

Experimental Infection with *Haemonchus contortus* /Design

The animals were randomly allocated into two experimental treatment groups (groups A and B) of six (6) animals each (i.e. group A for dry season and group B for wet season). Three weeks after ivomec®/deworming, the twelve (12) lambs were each infected orally with 10, 000 L_3 of *H. contortus* according to the recommendation of World Association for the Advancement of Veterinary Parasitologist (WAAVP) [9].

Faecal Egg Count

From the first to the third week post-infection, 2 g of faecal samples were collected once a week from each lamb for the determination of FEC (EPG) using the McMaster methods [8]. Similarly, faecal samples were collected weekly for four weeks post-treatment to also determine the FEC.

Treatment

Four weeks after infection, animals were treated with Albendazole at $200mgkg^{-1}$ [10].

Statistical Analysis

Means of data obtained from the experiment were analyzed using the software package for Graphpad prism (Version 4-0 – 2003). Student T- tests was used to assess the statistical significance for the seasonal influence on infection and on response to treatment with albendazole.

Table 1: Faecal egg count before treatment in both dry and wet seasons

S/No	Dry season	Wet season
1	8500	10000
2	6300	9800
3	9750	10000
4	10000	7500
5	7800	8700
6	8000	9500
TOTAL	50350	55500
Mean $\pm$ SEM	8392 ± 557.4^a	9258 ± 400.1^a

Mean with letter ^{a} show no significant difference between their means at p>0.05 as determined by unpaired Student t-test.

RESULTS

After infection with 10,000 larvae of the parasite, all the animals came down with Haemonchosis with mean egg per gram of feacal sample of 8392.0 and 9258.0 for dry and wet season respectively as shown in Table 1.

The mean egg per gram output after the albendazole treatment are 96.67 and 410.0 for dry and wet season respectively as shown in Table 2.

Table 2: Faecal egg count after treatment with Albendazole at 200 mgkg^{-1} in both dry and wet seasons

S/NO	Dry season	Wet season
1	20	200
2	100	600
3	40	800
4	80	210
5	300	250
6	40	400
TOTAL	580	2460
Mean $\pm$ SEM	6.67 $\pm$ 42^a	96.67 $\pm$ 42^b

Means with letter ^{a} and ^{b} show significant difference between their means at p>0.05 as determined by unpaired Student t-test.

The parasitization produced by the parasite in both season was not significant different ($p<0.05$), while the deparasitization produced by the albendazole in both season was significant different *($p<0.05$).*

DISCUSSION

Strategic deworming of livestock reduces worm burdens at critical periods. Knowledge of the seasonal changes in infection and the regional epidemiology of various helminthoses are vital to the timing of administration of anthelmintics in strategic deworming [11]. In Nigeria, early, mid and the end of the raining season are specific times that require prophylactic treatment to suppress the normal increase of gastrointestinal parasites population [12]. Strategically timed treatments have proven successful in preventing serious parasitic disease [13]. Taylor [13] showed that cattle subjected to strategic deworming over a two-year period were protected from gastrointestinal parasites and had significant better weight gains than untreated groups. In this study, the near elimination of the parasite seen in the dry season may not necessary be as a result of the albendazole treatment; this is because *Haemonchus contortus* is known to undergo hyperbosis within the animal at this time of the year only to become active in the wet season [7].

CONCLUSON

The study revealed that the seasonal egg output of *Haemonchus contortus* in sheep in both dry and wet season have no significant difference while after treatment with Albendazole. It was also observed that there was a significant difference in egg outputs between dry seasons and wet season. This could be as a result of re-infection of the animals by the parasite due to increase herbage contamination by the larvae in the wet season. Therefore, there is the need for repeated routing treatment with anthelmintics in the wet season than in the dry season as the incidence of re-infection are more common in the wet season than in the dry season.

Acknowledgements
The authors thank the Federal College of Wildlife Management New-Bussa, Niger State, Nigeria for granting the main author a staff development leave. The authors also like to thank Aleriwon Iyabo Titilayo for her assistance.

REFERENCES

[1] Dorny, P., Pandey Sivaraji, Vercruysse, J. **1999**. *Veterinary. Parasitology*. 80: 229-241.
[2] Chandrawathani, P, Brelin, D, Nor Fasiha, A.S, Adnan, M, Jamnah, O, Rehana, A.S, Hogland, J and Waller, P.J. **2003**. *Tropical Biomedicine*, 19:41-48.
[3] Suleiman , M.M.; Mamman M. Aliu Y.O.; Ajanusi J.O. **2005**. *Veterinarski arhiv*, 75 (6): 48-495.
[4] Preston J.M and Allonby E.W. **1979**. *Research in Veterinary Science*, 26: 134-139

[5] Waller, P. J. Echevarria F. Edd., C. Maciel S. Nari. A., Hausen J. W. **1986**. *Veterinary Parasitology*. 62: 181-184.
[6] Abdu P.A., Jagun, A.G., Gefu, J.O., Mohammed, A.K., Alawa, C.B.I., Omokanye, A.T. **2000**. A survey of ethnoventrinary practices of agropastoralist in Nigeria. In: Gefu, J.O; Abdu, P.A.; Alawa, C.B.I (Eds) Ethnoveterinary practices in Nigeria. *Proceeding of the International workshop on ethnoveterinary practices*, Kaduna State, Nigeria. Pp 25-37
[7] Taylor, M.A., Coop, R.L and Wall, R.L. **2007**. Veterinary Parasitology. Third Edition. Blackwell Publishing Ltd. Oxford. UK. 872 Pp.
[8] Hansen, J and Perry, B. **1994**. The epidemiology, diagnosis and control of helminth parasites of ruminants: A handbook. International Livestock Research Institute, Nairobi. 171 Pp.
[9] Coles, G. C., Bauer, C., Borgsteede, F. H., Geerts, S., Klei, T. R., Taylor, M. A. and Waller, P. J. **1992**. *Veterinary Parasitology, 44:* 35-44.
[10] Ibrahim, M.A., Nwude, N., Ogunsusi, R.A and Aliu, Y.O. **1984**. Screening of West African plants for anthelmintic activity. *International Livestock Center Africa Bullettin*, Addis-Ababa Ethiopia. 17:19-22.
[11] Taylor, S.M., Mallon, T.R and Kenney, J. **1985**. *Veterinary Record*, 117: 521-524.
[12] Alawa, C.B.I., Jokthan, G.E and Akut, K. (**2002**). *Preventive Veterinary Medicine*, 54: 79-90.
[13] Tailor M.A. (**1991**), *Veterinary Record*. 129-192.