A Survey of Gastrointestinal Helminth Parasites of Slaughtered Sheep around Kano Metropolis

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ABSTRACT

Parasitism in sheep is a substantial problem plaguing farmers across the nation. As gastrointestinal parasite infection is the most important limiting factor of sheep productivity, parasitism has a highly detrimental effect on the sheep industry. Hence the prevalence of helminth infection was examined in Kano metropolis. Faecal samples from the digestive tract of 50 slaughtered sheep were collected from three different areas around Kano metropolis (Kano Abattoir, Tudun Wada slaughtering Slabs, Kundila Veterinary) and microscopically examined. Of these 50 sheep, 47 (94%) harboured atleast one of the following gastrointestinal elements, Fasciola spp, Dicrocoelium spp, Paramphistromum spp, Moneiza spp, Avitellina spp, Trichostrongylus spp, Strongyloides spp, Nematodirus spp, Chaberta spp, Trichuris spp, Gaigeria spp, and Gongylonema spp. Most commonly encountered parasites were Monieza spp (58%), Fasciola spp (42%), Strongyloides spp (32%), Trichuris spp (20%) and Haemonchus spp (16%). The rate of infection was found to be high in males than in females and maximum infection was observed in younger age groups compared to adults. Multiple infections were found in both bale and female sheep.

KEYWORDS: *Cestrodes, Nematodes, sheep, Trematodes, Helminth, prevalence.*

INTRODUCTION

Ruminants, cattle, goats and sheep represent an important source of animal protein in many countries of the world, supplying a good percentage of the daily meat and dairy products in cities and villages in such countries including Nigeria (Nwosu, 2007). Apart from being the source of animal protein, their wastes are also very important in agriculture (Nawathe, 1985).

Urban and pre-urban livestock keeping has been hailed as a source of livelihood by some households in cities around the world (Mireri, 2007). Production potential of livestock development programmes is plagued in tropical and subtropical areas due to prevalence of helminthes which causes high mortality and great economic losses (Al-Quaisy et al. 1987).

Helminths or Worms cause a wide range of health problems to both men and animals (Colley, 2001). Helminthiasis in large part is caused by members of the phyla Nematoda, and Platyhelminthes (Kennedy, 2001). The species belong to both phyla occupy numerous niches within their mammalian hosts, ranging from intestinal lumen to intravascular and even intracellular sites (Littleword, 2001). They are responsible for substantial loss of productivity in the livestock industry. Their harmful effects on these animals range from gastrointeritis, anoxeria, abdominal distention, diarrhoea, emaciation, and so forth, all of which result in serious economic losses to the farmer and the nation (Junaidu, 1997). Similarly, they constitute a major impediment to efficient and profitable livestock production (Akerejola, 1999).

The prevalence of gastrointestinal helminthis is related to the agro-climatic conditions like quantity and quality of pasture, temperature, humidity and grazing behaviour of the host (Pal, 1993). However, specific parasites may be distributed throughout the world; they have different impact according to production system, management and geo-climatic conditions (Kennedy, 2001).

Amongst the parasitic diseases, endo-parasites are of greatest importance in sheep and goats. Common parasites of sheep and goat include coccidia, roundworms, tapeworms, and liver flukes (Bagley, 1997). The blood sucking parasites, Haemonchus contortus which is found in the abomasum of the sheep and goat causes significant blood loss, each worm removes 0.05ml blood per day so that sheep with a 500 H. contortus may loss about 250ml per day (Urquchart et al, 1987) resulting in decrease in erythrocytes, lymphocytes, haemoglobin, PCV, body weight and wool growth (Rasol et al, 1993; Hayat et al, 1996).

Total eradication of the parasites is the ideal at which to aim but, more often than not adjustment to programme that keep the parasites under control is the realistic situation (Soulsby, 1982).

The information on the prevalence of the various species of gastrointestinal parasites of sheep in Kano metropolis is important in the formulation of control strategies for the nomads and other farmers.

MATERIALS AND METHODS

COLLECTION OF FAECAL SAMPLES

Faecal samples were collected from slaughtered sheep in the three aforementioned areas in Kano metropolis. The samples were collected in clean labelled sterile vials, preserved in 10% formalin and taken to the laboratory for microscopic examination.

LABORATORY EXAMINATION

The formol-ether concentration technique (Agyemang, 1997) was used to analyze the sample. 1g of stool sample was emulsified with 4ml of 10% formol saline in a test tube using a cloth gauge and 3 – 4 ml of diethylether was added and shaken vigorously and allowed to stand for two minutes. The mixture was then centrifuged at 1000 revolutions per minute (1000rpm) for 3 minutes. Using a glass loosened and the tube was inverted to pour off the supernatants. The tube was returned to its original upright position and the fluid from the side of the tube allowed draining to the bottom. The deposit was mixed by tapping the tube with the finger and using a pasteur pipette. A drop of the sediment was applied on a microscope slide, covered with a cover slipe, and examined under the microscope using X10 and X40 objectives. Luqol's iodine was also used as a stain. Identification of the eggs or cysts made on the basis of morphology and size of eggs.

RESULTS

Of the total examined 50 sheep faeces around Kano metropolis, 47 (94%) were found to be positive for one or more genera of Nematodes, Trematodes and Cestodes. The most common helminth parasites encountered were summarized in Table I. Nematodes were found most prevalent.

The prevalence rate of Cestodes, nematodes and Trematodes by sex of sheep are shown in Table II, III and IV respectively. Multiple infections involving all the three classes of helminths have been found in 40% of the animals examined, as shown in Table V. The egg counted per unit gram of faeces proved the basic parasitic feature that the juvenile are found to be more susceptible to parasitic infection than the adult as shown in Table VI.

Table I: Frequency of Occurrence Rates of Helminths among Sheep in Kano Metropolis

	Frequency of Occurrence	
Parasite	**Number Examined**	**Number of Infection (% infected)**
TREMATODES		
Fasciola spp	50	21(42)
Dicrocoelium spp	50	6 (12)
Paraphistomum spp	50	7 (14)
Schistosoma spp	50	4 (8)
CESTODES		
Taenia spp	50	6 (12)
Monieza spp	50	29 (58)
Avitellina spp	50	2 (4)
NEMATODES		
Nematodirus spp	50	4 (8)
Chabertia spp	50	4 (8)

Ostergia spp	50	2(4)
Trichostrongylus spp	50	2 (4)
Trichuris spp	50	10 (20)
Haemonchus spp	50	8 (16)
Strongyloides spp	50	16 (32)
Bonostomum spp	50	2 (4)
Geigeria spp	50	2 (4)
Gongylomena spp	50	6 (12)

Table II: The Prevalence of Cestodes in Sex among Sheep in Kano Metropolis

CESTODES

Males			**Female**		
Parasites	**No. examined**	**No. infected (%)**	**Parasites**	**No. examined**	**No. infected (%)**
Taenia spp	16	2 (12.5)	Taenia spp	34	4 (11.76)
Monieza spp	16	12 (75)	Monieza spp	34	17 (50)
Avitellina spp	16	-	Avitellina spp	34	2 (5.8)

Table III: The Prevalence of Nematodes by Sex among Sheep in Kano Metropolis

NEMATODES

Males			**Females**		
PARASITES	**No. examined**	**No. infected (%)**	**Parasites**	**No. examined**	**No. infected (%)**
Chabertia spp	16	1 (6.5)	Chabertia spp	34	3 (8.82)
Nematodirus spp	16	2 (12.25)	Nematodirus spp	34	2 (5.88)
Ostergia spp	16	-	Ostergia spp	34	2 (5.88)
Trichostrongylus spp	16	2 (12.25)	Trichostrongylus spp	34	-
Strongyloides spp	16	6 (37.5)	Strongyloides spp	34	10 (29.4)
Haemonchus spp	16	4 (25)	Haemonchus spp	34	6 (17.64)
Bunostomum spp	16	3 (18.75)	Bunostomum spp	34	5 (14.7)
Geigeria spp	16	1 (6.25)	Geigeria	34	1 (2.9)
Gongylonema spp	16	4 (25)	Gongylonema spp	34	2 (5.88)
Trichuris spp	16	4 (25)	Trichuris spp	34	6 (17.69)

Table IV: The Prevalence Rate of Trematodes by Sex among Sheep in Kano Metropolis

Males			Females		
Parasites	**No. examined**	**No. infected (%)**	**Parasites**	**No. examined**	**No. infected (%)**
Fasciola spp	16	6 (43.75)	Fasciola spp	34	17 (50)
Dicrocoelium spp	16	5 (31.25)	Dicrocioelium spp	34	1 (2.94)
Paramphistomum spp	16	3 (18.75)	Paramphistomum spp	34	4 (11.74)
Schistosoma spp	16	1 (2.5)	Schistomum spp	34	2 (5.8)

Table V: Frequency of Occurrence of Cestode, Nematode, Trematode Infection and Multiple Infections in Sheep around Kano Metropolis

	Trematode	**Nematode**	**Cestode**	**Nematode and Trematode**	**Nematode and Cestode**	**Cestode and Trematode**	**Trematode and Nematode**	**Total**
No. of Sheep examined	50	50	50	50	50	50	50	-
No. of animals infected	8	3	3	18	2	3	20	47
% infection	16	6	6	16	4	6	40	94

Table VI: Prevalence and Intensity of Helminths Infection among Sheep in Kano Metropolis

Age / Month	**No. Examined**	**No. (%) Infected**	**Total No. of Egg per gm of Faeces**	**Average egg per gm of faeces**
0 – 6	4	3 (75)	484	121
7 – 13	28	28 (100)	2540	91
14 – 19	13	12 (92)	520	40
20 +	5	3 (60)	70	14

DISCUSSION

The present study indicates that the infection with gastrointestinal heminthes is a frequent phenomenon among the sheep in Kano metropolis as previously documented. The high prevalence of helminthic infections observed in present study was previously reported by Jatau et al (2011). In the present study, Nematodes infections were high prevalent followed by Trematodes and Cestodes. These results are consistent with findings of different

researchers in the semi-arid zone of north-eastern and south-eastern Nigeria (Anene, 1994, Fakae, 1990).

The various species of nematodes recovered during this study had already been reported by various researchers in different parts of the world (Ahmed and Ansari, 1987, Asanji and Williams, 1987, Gulomaraes and Walter, 1987, Njau, 1987, Urlarte and Valderrabno, 1984, Pal and Qayyum, 1993).

The low level of helminth infection reported in adult sheep is attributed to development of the significant immune capability. Following the elimination of the major part of their own burden when they are 11 – 12 months of age, sheep tend to remain relatively resistant to serious re-infection, however they require constant exposure to some level of infections to maintain their resistant status (Laksmi 2001, Sissay 2006).

Table II, III and IV show the prevalence rate of Cestodes, nematode, and Trematodes respectively. In all cases, males were found to be more infected than the females. This is probably due to the fact that females take more food than the males, especially during pregnancy and when they are feeding their young ones. It is documented that helminths infection is conversely favoured by the state of nutritional condition.

Multiple infection involving Trematodes, cestodes and nematodes have been found in 40% of the animals examined. According to Boodie (1956), alimentary parasitism is practically never due to infections with only one specie but due to multiple infestation with the exception of ascends-infestation in pigs, dogs and cats; tapeworm infestations in cattle and sheep and liver fluke infestations in cattle and sheep. Therefore about 70% of the sheep examined are supposed to show up clinical symptoms. However, most of the animals do not show up these clinical symptoms, probably due to some factors as age, previous helminths infection and state of nutrition of the sheep.

According to Ogbe et al (1990), the faecal egg count is not reliable indication of actual worm burden. But according to Boodie (1956) to a considerable extent, it is used to interpret the history, symptoms and clinical signs of the case. In this study however, the faecal egg counts was used to determine the intensity of helminths infection among sheep with regards to their age groups.

Sheep of age 0 – 6 months had a total prevalence of 25% and the average egg count per gramme of faeces of 121. Those with age group 20 months and above had a prevalence of 60% and 14 egg per unit gramme of faeces. Therefore, the prevalence in both age groups is significant and the basic parasitological feature that the juveniles are more infected than the adult have been proved since the 0 – 6 months age group recorded the highest egg count per gramme of faeces and the lowest was recorded in the age group 20 month and above.

It is well understood that epidemiology forms the foundation in which the edifice of control of parasitic diseases can be constructed.

Keeping in view the above results some control measures for gastrointestinal parasites can be undertaken to reduce the intensity of the parasitic infection.

CONCLUSION

In conclusion, various gastrointestinal parasites have been found in sheep in Kano metropolis. Hence, the high prevalence rate of helminthiasis in livestock needs to be checked periodically.

Regular control measures should be practiced and farmers educated in the proper use of antihelminthiasis. Epidemiology facts suggests that high standard of sanitation in modern animal husbandry will prevent exposure of livestock to graze in deteriorated and environmentally polluted range lands will be effective in controlling the diseases.

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