PREVALENCE OF INTESTINAL HELMINTH PARASITES IN GOATS OF ROSHI RURAL MUNUCIPALITY-11, NEPAL

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Abstract: A total of 150 fecal pellet samples were collected from Roshi Rural Municipality-11, Nepal from September 2017 to February 2018 and examined under microscope by using sedimentation technique. In the study area, 17.35% samples were found to be positive with the intestinal helminth parasites. The prevalence of *Fasciola* sp was found highest (4.67%) and least was *Haemonchus* sp. (1.33%). Age wise prevalence found highest among the samples from goats more than six months age group i.e. 20.37% and least among samples from goats of age group three to six months i.e. 14.29%. The rate of prevalence of helminth parasites was found more in female goats (18.07%) than in male goats (16.42%) which was statistically insignificant (χ^2 = 0.5877, P > 0.05, d. f. = 2). Season wise prevalence of helminth parasites was found higher in summer season which was statistically insignificant (χ^2 = 0.7033, P>0.05, d.f. =1). Similarly, 8.69% samples were found positive, out of 92 samples which were provided with the antihelminthic drugs and 31.03% samples were found positive out of 58 samples which were not provided with the antihelminthic drugs which was statistically significant (χ^2 =10.241, P>0.005, d.f.=1).

Key words: Age, Faecal sample, Intestinal helminth, Microscope, Prevalence, Ruminent, Sedimentation, Sex.

1. INTRODUCTION

Small ruminants mainly goats are found in all parts of Nepal. Goats, a member of the bovine family and sub family caprinae, are mainly reared for meat and even milk too. Goats are the important source of livelihood of the people of Nepal. Poor farmers of the hills, who cannot invest large sum of money in other cattle and buffaloes, usually prefer sheep and goats husbandry which has no social, cultural and religious taboos, or caste restrictions [1]. The livestock like sheep and goats are attacked by various kinds of parasites.

Helminths are also referred to as intestinal worms feeding on living hosts. The important factor causing productivity loss or yield loss has been the infection with gastrointestinal nematodes. Parasitic gastro-enteritis continues to pose a serious health threats and limitations to the productivity of small ruminants due to associated morbidity, mortality and cost of treatment and control measures on a clinical and subclinical level [2]. O*stertagia* sp, *Oesophagostomum* sp, *Trichuris* sp are the most important and widely prevalent nematodes. Those nematodes in the small intestine are the main agents to cause severe damage to the intestinal mucous membrane. Especially, *Toxocara* sp and *Dictyocaulus* sp are the main species that have the worldwide distributions and the prevalence is higher in cattle and buffaloes [3].

Ruminants are largely affected by cestodes which are found in gut. Cestodes are acquired by eating contaminated food and water. This group consists of the genera *Moniezia* sp, which is worldwide in distribution and *Taenia* sp, which is commonly found in the rumen of the domestic and wild carnivorous. They have been mainly reported from Asia and Africa [3]. Trematodes commonly known as flukes, often live in the bile duct or small intestine and may also affect the lungs. Their eggs are passed with the feces of the host. Some of them are ingested but some burrow inside the skin after hatching.

2. MATERIALS AND METHODS

2.1. Study area

Kavrepalanchowk district, a part of province No. 3, is one of the seventy-seven districts of Nepal. The Kavrepalnchok district covers an area of 1,396 sq. km. It's headquarter is Dhulikhel and total number of household is 80,720 with a total population of 3, 81,937 [4], [5]. Roshi Rural Municipality is formed after the declaration of local levels by Nepal Government on 2017 by merging 12 previous VDCs. It is bounded by Timal RM and Sindhuli district in the east, Bethanchowk RM in the west, north by Timal RM and Namobuddha Municipality and south by Khanikhola and Mahabharat RM. It lies 280m to 3018 m above from the sea level and has a total area of 173sq.km. The total population of this RM as per the CBS, National Census (2011) is 28,746(males-13,545 and female-15,215), out of which 3,609 people are inhibiting in Roshi RM-11(male-1,674 and female-1,935). The population density of this RM is 163.2 per sq.km. More than 80% people of this rural municipality are engaged in agricultural sector. People rely on farm-

ing, rearing cattle like cows, buffaloes and goats. As a result, animal husbandry and agriculture has been the important source of livelihood of people. People rear a total of 2000 local goats in the area (local survey conducted by RM office, 2017).

2.2 Fecal sample collection

Fecal samples were collected from land just after defecation. Each sample was taken in small plastic containers with lid and labeled with date, sex, age (based on questionnaire) and date of anthelminthic treatment were recorded and 10ml of 1% formalin was added into sample container. All samples were kept in refrigerator at 4°C for later examinations.

2.3 Sample examination

Sedimentation technique was used for the examination of fecal samples. The eggs get deposited at the bottom of the test tube after the centrifugation with zinc sulphate solution. With the help of pipette, a drop of deposited material was taken on the slide. On it, a drop of methylene blue was added and was examined under a microscope at 4X and 10X.

2.4 Questionnaire survey

Structured questionnaire were prepared and tested among the farmers. The finalized questionnaires were administered among the farmers who were included in the present study. The questionnaires were focused mainly to find out the knowledge, attitude and practices (KAP) in relation to the parasite infection along with anthelmintic administration.

3. RESULT

3.1 Prevalence rate of helminth parasites

Among 150 samples of goats faecal pellet collected and examined, 26 (17.34%) were found to be infected withvarious helminth parasites (Fig. 1).

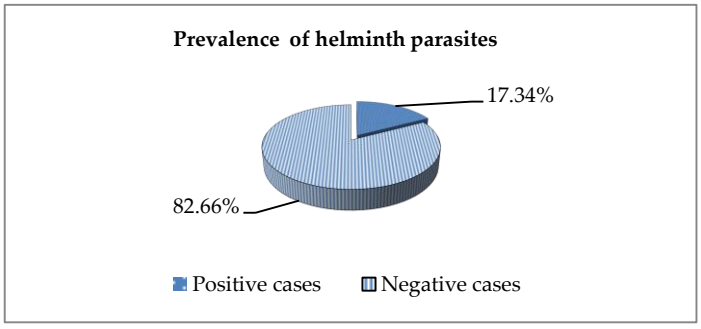

Fig 1: Prevalence of helminth parasites in goat.

3.2 Prevalence of specific helminth parasites

Among the helminth parasite infection, nematoda infection was highest (10.67%), followed by trematoda (4.67%) and cestoda (2%). Altogether seven types of helminth parasites were found. Infection of *Fasciola* sp was found highest i.e. 4.67% and infection of *Haemonchus* sp was least i.e. 1.33% (Table 1).

Table 1: prevalence rate of specific helminth parasites

S.N.	Class	Genera of helminth		Prevalence percentage
		Genera	Total positive	
1.	Trematoda	*Fasciola* sp	7	4.67%
2.	Cestoda	*Taenia* sp	3	2%
3.	Nematoda	Strongylus sp	3	2%
		Trichuris sp	4	2.67%
		Dictyocaulus sp	4	2.67%
		Cooperia sp	3	2%
		Haemonchus sp	2	1.33%
			Total positive=26	Total prevalence percentage=17.34%

3.3 Seasonal prevalence of helminth parasites

Altogether 80 samples were collected in summer season and 70 samples were collected in winter season from the study area. Out of 80 samples collected in summer season, 16(20%) samples were found positive and out of 70 samples collected in winter season, 10(14.29%) samples were found positive for helminth parasite (Fig. 2) which was found statistically insignificant. ($\chi^2 = 0.7033$, P>0.05, d.f. =1).

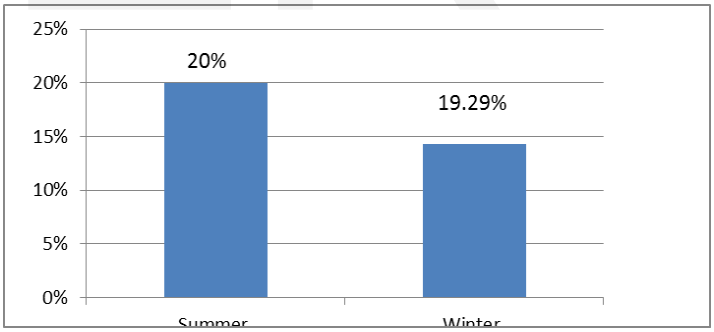

Fig 2: Seasonal prevalence of helminth parasites

3.4 Age wise prevalence of helminth parasites

Table 2 shows the prevalence of helminthes were maximum in goats more than six months (20.37%) and minimum in the goats of three to six months (14.29%) which was statistically insignificant (χ^2 =0.588, P<0.05, d. f. = 2).

Table 2: Age wise prevalence of helminth parasites

S.N.	Age	Total	Positive number	Percentage
1.	Less than three months	40	7	17.5%
2.	Three months-six months	56	8	14.29%
3.	More than six months	54	11	20.37%

3.5 Sex wise prevalence of helminth parasite

Out of 150 stool samples examined, 67 (44.67%) belonged to male goats and 83 (55.33%) belonged to female goats. Out of 67 male goats, 11 (16.42%) were found positive for helminth parasites. Likewise, out of 83 female goats, 15 (18.07%) were found positive (Table 3) which was statistically insignificant. ($\chi^2 = 0.5877$, $P > 0.05$, d. f. = 2).

Table 3: Sex wise prevalence of helminth parasite

S. N.	Sex	Total	Positive	Percentage
1.	Male	67	11	16.42%
2.	Female	83	15	18.07%

3.6 Prevalence of helminth parasites in relation to anti-helminthic drugs administration within last six months

Out of 150 examined stool samples, 92(61.33%) samples were from goats provided with the antihelminthic drugs within six months and 58(38.67%) samples were from goats not provided with the antihelminthic drugs within six months. Out of 92 samples from goats provided with antihelminthic drugs, 8(8.69%) samples were found positive and out of 58 samples from goats not provided with antihelminthic drugs, 18(31.03%) samples were positive to intestinal helminth parasites (Fig. 3) which was found statistically significant ($\chi^2 = 10.241$, $P > 0.005$, d.f.=1).

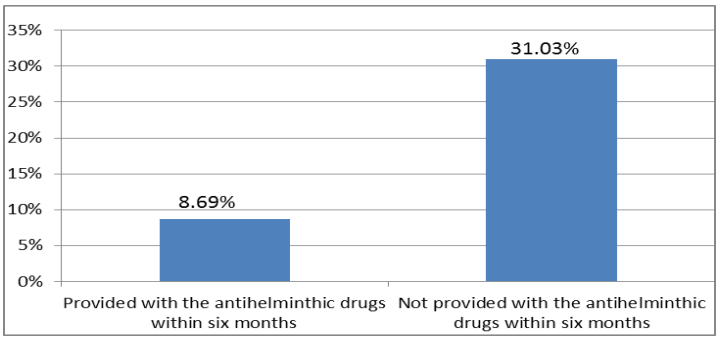

Fig. 3 Prevalence of helminth parasites in relation to antihelminthic drugs administration within last six months

4. DISCUSSION

The study was carried out to determine the general rate of prevalence as well as the seasonal prevalence of intestinal helminth parasite of goat. The prevalence of gastro intestinal parasites in goat is generally influenced by the way of feeding and as far as possible the geographical distribution of the area. The present study showed the overall prevalence of GI helminths to be 17.34%. This result is relatively lower than the report on seasonal prevalence on goats Tripathi and Subedi (2015) in Kapilvastu which was 67.92% [6]. The higher prevalence was also reported by Opeara, Nwaobasi and Okoli (2005) in southeast Nigeria to be 90.1% [7]. The prevalence difference in different study area could have resulted from difference in management system, topography and climatic condition that favors the survival of infective stage of the parasite and intermediate hosts. One genera of Trematode (*Fasciola* sp.), one genera of Cestode (*Taenia* sp.) and five genera of Nematodes (*Strongylus* sp., *Trichuris* sp., *Dictyocaulus* sp., *Cooperia* sp. and *Haemonchus* sp.) were observed. The prevalence rate of *Fasciola* sp. was found more in goats and the least prevalence were shown by *Haemonchus* sp. The result of current study indicate the prevalent helminths egg with respect to their genera were *Fasciola* (4.67%), *Trichuris* (2.67%), *Dictyocaulus* (2.64%), *Strongylus* (2%), *Taenia* (2%), *Cooperia* (2%) and *Haemonchus* (1.33%). In this result, the *Fasciola* sp. were highly prevalent than other genera. High prevalence of *Fasciola* sp was reported from Surkhet among goats (Ghimire, 1987) [1], followed by 58% from Chitwan district (Dhakal nand Kharel, 1988) [8], 31.25% infection from Dhanusa district (Jaiswal, 2006) [9], 31.5 % from Kenya (Waruiru, Otieno and Mutune, 2005) and 8.8 % from Himanchal Pradesh [10], India (Jithendran and Bhat, 2001) [11]. A research work by Ijaz *et al*., (2008) on goats of Lahore, Pakistan showed highest infection rate of nematodes (42.67%) followed by trematodes (16.67%) and cestodes (4%) [12]. But present study showed higher overall prevalence rate of nematodes (10.67%), cestodes (2%) and trematodes (4.67%).

There was higher occurrence of all GI helminths in female animals (18.07%) than male animals (16.42%). But sex is statistical insignificant on the prevalence of helminths parasite. In the present study, prevalence of helminthes was found more in summer season (20%) while the prevalence of helminthes in winter season was 14.29%. A research carried out by Bashir (2009) on seasonal prevalence of intestinal parasite of goat was found 46% positive samples in winter and 90.3% samples were found positive in summer [13]. Out of 150 samples collected, 40 samples belonged to the small kids having the age of less than three months, 56 samples belonged to the medium sized goats having the age of three months to six months and 54 samples belonged to the goats having the age

of more than six months. The highest rate of prevalence of helminth parasites was observed in the goats having the age of more than six months i.e. 20.37%. The least prevalence of helminth parasites was seen in the goats having the age of three months to six months which was 14.29% and the rate of prevalence in the goats of less than three months age group was 17.5%. Regarding administration of anthelminthic drugs within last six months, 8.69% samples were found positive for helminth parasites but higher prevalence was found among samples collected from goats, not provided anthelminthic drugs within last six months i. e. 31.03%, which was statistically significant.

5. CONCLUSION AND RECOMMENDATIONS

Gastro-intestinal helminth parasites are important cattle health problems in the study area. Geographical location of the study area, age, sex, and anthelmintic therapy status had a varying degree of contribution for helminth parasites infection.

Based on the aforementioned conclusion, the following recommendations are indicated: significance of these parasites should not be underestimated as they reduce the growth, productivity, reproductive potential of animals; strategic treatment and awareness should be adopted as former livelihood relies on rearing cattle.

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