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RESEARCH ARTICLE

Prevalence of Some Gastrointestinal Parasites in Sheep in Southern Punjab, Pakistan

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ABSTRACT

The present study was conducted on various herds of Kacchi and Lohi breeds of sheep in Southern Punjab, Pakistan to investigate the prevalence of gastrointestinal tract (GIT) parasites. A total of 523 sheep were examined. Out of which 240 were found to contain various GIT parasites. The overall prevalence rate was 46.33%. The prevalence of *Fasciolia hepatica, Avitellina centripunctata, Haemonchus contortus* and *Trichuris globulosa* was 21.41, 12.23, 6.50 and 5.73%, respectively. Sex wise prevalence of gastrointestinal parasites was higher in male than female hosts ($P<0.05$). The maximum infection was observed in lambs compared to adults ($P<0.05$). The prevalence of different species of endoparasites also varied in sheep of different body weight groups ($P<0.05$). The highest infection was observed in Kacchi breed than Lohi breed. In conclusion, the data obtained in this study suggest that the age, sex, body weight and breed are important factors which influence the prevalence of gastrointestinal parasites.

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INTRODUCTION

Parasitic infections especially gastrointestinal nematode and trematode pose a serious health threat and limit the productivity of livestock due to the associated morbidity, mortality, cost of treatment and control measures (Nwosu *et al.*, 2007; Raza *et al.*, 2010). The prevalence of helminths of small ruminants results in low productivity due to stunted growth, poor weight gain and poor feed utilization (Pedreira *et al*., 2006). Helminthiasis adversely affects ruminants, causing hematological and biochemical disturbances (Ijaz *et al*., 2009), anorexia, weight loss, poor reproductive performance, and even death of lambs (Hussain and Usmani, 2006).

In Pakistan, parasitism is one of the major threats for livestock, especially causing obstacles to the development of a profitable sheep industry (Asif *et al.,* 2008). Gastrointestinal parasites decrease the resistance to diseases and even cause severe mortality thus leading to heavy loss. Ngategize *et al.* (1993) reported the economic loss due to ovine fasciolosis in the Ethiopian highlands which were based on available data on mortality, weight loss and reduced reproductive efficiency. These loses were estimated at 48.4 million Ethiopian Birr per year of which 46.5, 48.8 and 4.7% were due to mortality, productivity (weight loss and reproductive problems) and live condemnation, respectively. A decrease in profitability up to 15% and weight loss up to 50% due to gastrointestinal parasites have been reported (Hussain, 1985).

Although, considerable work has been done on endoparasites of sheep in Pakistan (Ijaz *et al*., 2009; Gadahi *et al*., 2009; Tasawar *et al*., 2010; Saddiqi *et al*., 2010), there are no published reports on the prevalence of endoparasites in sheep in Southern Punjab. Keeping in view the importance of gastrointestinal endoparasites in animals, the present study was executed to investigate the prevalence of gastrointestinal parasites in sheep reared under traditional husbandry system in Southern Punjab, Pakistan.

MATERIALS AND METHODS

Prevalence of gastrointestinal parasites in sheep kept in different localities of three districts of Southern Punjab (Dera Ghazi Khan, Multan and Khanewal) was estimated. A total of 523 sheep including 72 males and 451 females were examined for the prevalence of gastrointestinal parasites. Depending upon the age, these animals were divided into six groups, viz. 3-15 (n=129), 16-28 (n=66), 29-41 (n=114), 42-54 (n=94), 55-67 (n=72) and 68-80 months (n=48) with four body weight groups i.e. 15-25 (n=141), 26-36 (n=215), 37-47 (n=134) and >47kg (n=33) belonged to two breeds i.e. Lohi (n=215) and Kacchi

(n=308). The relationship between different groups of the host and GIT parasites were studied.

From each animal under study, 5 to 10 grams of fecal material was collected directly from the rectum. Samples were brought to the Parasitology Laboratory, Institute of Pure and Applied Biology, Bahauddin Zakariya University, Multan for identification of eggs/ larvae of gastrointestinal parasites. Direct microscopic examination, centrifugation floatation and sedimentation techniques were used to examine fecal samples (Cable, 1985). Identification of eggs was made on the basis of morphology and size of eggs.

In order to see the magnitude of variation in the prevalence of endoparsites among sheep of various groups, the data were analyzed statistically using Chi square test.

RESULTS

Fasciolia hepatica was significantly (χ^2=62.12, P=0.00) most prevalent than *Avitellina centripunctata*, *Haemonchus contortus* and *Trichuris globulosa* (Table 1). The maximum incidence of *F. hepatica* was recorded in both gender, followed by *A. centripunctata*, *H. contortus*, and *T. globulosa* respectively (Table 2). But the parasites were more prevalent in male hosts as compared to female hosts (χ^2= 7.95, df = 3, P=0.047).

Table 1: The overall prevalence of some gastrointestinal parasites of sheep

Name of Parasites	No. of sheep infected	Prevalence (%)
Fasciolia hepatica	112	21.41
Avitellina centripunctata	64	12.23
Haemonchus contortus	34	6.50
Trichuris globulosa	30	5.73
Total	240	45.9

Percentage has been calculated from total number of animals examined (n=523). The prevalence of various GIT parasites differed significantly (χ^2 =62.12, df 3, P=0.00).

Table 2: Relationship between sex and some gastrointestinal parasites

Name of Parasites	Male hosts (n=72)		Female hosts (n=451)	
	No. of sheep infected	Prevalence (%)	No. of sheep infected	Prevalence (%)
Fasciolia hepatica	19	26.38	93	22.40
Avitellina centripunctata	13	18.05	51	11.31
Haemonchus contortus	11	15.27	23	5.54
Trichuris globulosa	10	13.88	20	4.43
χ^2	7.95		64.42	
df	3		3	
P Value	0.047		0.000	

The results of relationships between age and endoparasites of sheep are shown in (Table 3). The highest prevalence rate of GIT parasites occurred in younger age groups while the lowest prevalence was recorded in older age groups. The results represents that younger animal had significantly higher prevalence than older animals (χ^2= 381.0, df = 25, P=0.000)

The relationship between body weight and endoparasites of sheep was recorded (Table 4). The data indicated that infestation of *F. hepatica, A. centripunctata, H. contortus* and *T. globules* were maximum in poor body weight groups, while the animal with better body weight showed lower prevalence. GIT prevalence was significantly highest in poor body weight group than good body condition (χ^2=22.45, df=12, P=0.033)

The results of relationships between different breeds and gastrointestinal parasites revealed the highest infection in Kacchi 90/308 (29.22%) as compared to Lohi 57/215 (26.51%) but the difference was non significant (χ^2= 0.259, df=1, P=0.611).

DISCUSSION

Out of 523 sheep examined, 240 (45.9%) were found to be infected with endoparasites (nematodes, trematodes and cestodes). Species-wise incidence of *Fasciolia hepatica, Avitellina centripunctata, Haemonchus contortus* and *Trichuris globulosa* were 21.41, 12.23, 6.50 and 5.73%, respectively.

The various species of endoparasites recovered during present investigation have been reported by various researchers in different parts of the world (Pedreira *et al.,* 2006; Nwosu *et al*. 2007; Raza *et al*., 2007; Gadahi *et al*., 2009; Tasawar *et al*., 2010). The prevalence recorded in the present study was lower than that reported earlier (81.17, 62%) by Pandit *et al*. (2003) and Raza *et al*. (2007), respectively. The results of the present study are similar to the studies reported by Nwosu *et al.* (2007). The rate of helminths infection in sheep varies in different parts of the world. A variety of factors like grazing habits, level of education and economic capacity of the farmers, standard of management and anthelmintic used can influence the prevalence of helminths. Prevailing agro-climatic conditions like overstocking of animals, grazing of young and adult animals together with poorly drained land provide an ideal condition for the transmission of endoparasites to build up clinical infestation of the host (Gadahi *et al*., 2009). All the livestock in the area under investigation largely depend on grazing in deteriorated rang-lands. It was also observed that farms in these areas lack fences and cattle, sheep and goats use the same pasture for grazing.

Sex wise observations revealed that the prevalence of gastrointestinal parasites was more in males (P<0.05) than females. The results of the present study are supported by Kanyari *et al*. (2009), who found females were more resistant to infection than males after puberty, although there were no differences before puberty. Raza *et al*. (2007) reported the same that ram were more susceptible to gastrointestinal parasites parasite as compared to ewe.

Barger (1993) reviewed the effect of host sex on resistance levels. These differences were observed around or after puberty, and no difference was observed prior to puberty. He also reported that these differences may be due to a stimulatory effect of estrogens on immune responses and that androgens may actually have an opposite effect (Bilbo and Nelson, 2001). The influence of sex on the susceptibility of animals to infections could also be attributed to genetic predisposition and differential susceptibility owing to hormonal control. Testosterone is known for its immunosuppressive activity (Seli and Arici, 2002), and this has often been invoked as the major reason

Table 3: Prevalence of various some gastrointestinal parasites of sheep (n=523) in relation to age

Parasites	Age groups of sheep (Months)					
	3-15 (n=129)	16-28 (n=66)	29-41 (n=114)	42-54 (n=94)	55-67 (n=72)	68-80 (n=48)
Fasciolia hepatica	35(27.13)	9(13.63)	27(23.68)	20(21.27)	17(23.61)	4(8.33)
Avitellina centripunctata	22(17.05)	3(4.54)	15(13.15)	9(9.57)	11(15.27)	4(8.33)
Haemonchus contortus	17(13.17)	2(3.03)	6(5.26)	6(6.38)	3(4.17)	0(0)
Trichuris globulosa	15(11.62)	1(1.51)	5(4.38)	7(7.44)	0(0)	1(2.08)

Figures in parenthesis indicate percentage. The prevalence of various GIT parasites in relation to age differed significantly (χ^2 =381.00, df=25, P=0.00).

Table 4: Relationship between body weights with some gastrointestinal parasites of sheep (n=523) in Southern Punjab, Pakistan

Parasites	Body weight groups of sheep (kg)			
	15-25 (n=141)	26-36 (n=215)	37-47 (n=134)	>47 (n=33)
Fasciolia hepatica	37 (26.24)	40 (18.60)	30 (22.38)	5 (15.15)
Avitellina centripunctata	24 (17.02)	21 (9.76)	15 (11.19)	4 (12.12)
Haemonchus contortus	15 (10.63)	9 (4.18)	8 (5.97)	2 (6.06)
Trichuris globulosa	13 (9.21)	10 (4.65)	6 (4.47)	0 (0)

Figures in parenthesis indicate percentage. The prevalence of various GIT parasites in relation to body weight differed significantly (χ2=22.45, df=12, P=0.033).

for the higher susceptibility of males to vide variety of infectious diseases (Roberts *et al*., 2001). The results of the present study are in agreement with Gualy *et al*. (2006), Raza *et al*. (2007) and Tasawar *et al*. (2010) who reported prevalence of gastrointestinal parasite infection of sheep higher (P<0.05) in rams than in ewes.

The results of present investigation have revealed that age of the host seems to have influence on the prevalence of infection. Age-wise results revealed the highest prevalence in younger age groups of sheep and with increase in age, the infection level decreased (P<0.05). The low level of gastrointestinal parasites reported in adult hosts may be due to the development significant immunity. Age is an important factor in the onset of infection in host body. Magona and Musisi (2002) and Raza *et al*. (2007) reported that the age of animal has a significant influence on the level of risk of gastrointestinal infections in sheep with higher prevalence in young goats than adults. Tasawar *et al*. (2010) reported that the younger animals were more susceptible to nematode parasites compared to older age animals. The present results are also in accordance with the results reported by Tariq *et al*. (2008).

Relationship between body weight of sheep and parasites showed that the endoparasites had highest prevalence in lower body weight group and lowest in higher body weight group of sheep. The results show that as the weight of animal increases the parasitic infection decreases. The results were substantiated by Kanyari *et al.* (2009) and Tasawar *et al.* (2010). They reported that sheep and goats having lower body weight were heavily infected with endoparasites than those having higher body weight. This could be due to the acquired immunity.

In the present study non significant (P>0.05) relationship were found in sheep breed and gastrointestinal parasites. But the result showed Kacchi breed had slightly higher prevalence than Lohi breed. Similar results were found by Wildeus and Zajac (2005) and Li *et al*. (2001) reported the highest gastrointestinal parasitic infection in Suffolk than gulf coast native breeds of sheep in Gulf Coast region of United State. Amarante *et al*. (2004) reported that Hair sheep breeds are more resistant to helminths than Wool breeds. It has also been shown that Bhakarwal and Corriedal breeds are more resistant than local Kashmiri breed (Tariq *et al*., 2008).

In conclusion, the present study indicated that sex, age, body weight and breed are important factors which influence the prevalence of gastrointestinal parasitic infection in sheep in Southern Punjab, Pakistan. The infections may be very important economically leading to retarded growth; reduced productivity and animals are more susceptible to other infections. However, the combination of strategic use of anthelmintics with traditional veterinary medicine and good management could improve the control of gastrointestinal parasitic infection in sheep.

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REFERENCES

Amarante AET, PA Bricarello, RA Rocha and SM Gennari, 2004. Resistance of Santa Ines, Suffolk and IIe de France sheep to naturally acquired gastrointestinal infections. Vet Parasitol, 120: 91-106.

Asif M, S Azeem, S Asif and S Nazir, 2008. Prevalence of gastrointestinal parasites of sheep and goats in and around Rawalpindi and Islamabad. Pak J Vet Anim Sci, 1: 14-17.

Barger IA, 1993. Influence of sex and reproductive status on susceptibility of ruminants to nematode parasitism. Int J Parasitol, 23: 463-469.

Bilbo SD and RJ Nelson, 2001. Sex steroid hormones enhance immune function in male and female Hamsters. Am J Physiol, 280: 207-213.

Cable RM, 1985. In: An Illustrated Laboratory Manual of Parasitology; 5th Ed, Surjeet Publications, Delhi, India.

Gadahi JA, MJ Arshad, Q Ali, SB Javaid and SI Shah, 2009. Prevalence of gastrointestinal parasites of

sheep and goats in and around Rawalpindi, Islamabad. Vet World, 2: 51-53.

Gualy M, M Schackert, B Hoffman and G Erkardt, 2006. Influence of sex on the resistance of sheep lambs to an experimental *Haemonchus contotus* infection. Dtsch Tierarztl Wochenschr, 113: 178-181.

Hussain HU and RH Usmani, 2006. Livestock of Pakistan. 1st Ed., Livestock Foundation, Islamabad.

Hussain Q, 1985. Studies on the incidence of gastrointestinal parasites and efficacy of Banmnth-II against nematodes in buffalo calves. M.Sc. Thesis, Dept Parasitol, Univ Agric, Faisalabad, Pakistan.

Ijaz M, MS Khan, M Avais, K Ashraf, MM Ali and MZU Khan, 2009. Infection rate and chemotherapy of various helminths in diarrhoeic sheep in and around Lahore. J Anim Plant Sci, 19: 13-16.

Kanyari, PWN, J M Kagira and R J Mhoma, 2009. Prevalence and intensity of endoparasites in small ruminants kept by farmers in Kisumu Municipality, Kenya. Livestock Res Rural Develop, 21: 111-116.

Li Y, JE Miller and DE Franke, 2001. Epidemiology, observation and hetrosis analysis of gastrointestinal nematode parasitism in Suffolk, Gulf Coat Native and cross-breed lambs. Vet Parasitol, 98: 273-283.

Magona JW and G Musisi, 2002. Influence of age, grazing system, season and agroclimatic zone on the prevalence and intensity of gastrointestinal strongylosis in Ugandan goats. Small Rum Res, 44: 187-192.

Ngategize PK, T Bekele and G Tilahun, 1993. Financial losses caused by ovine fasciolosis in the Ethiopian highlands. Trop Anim Health and Prod, 25: 155-161.

Nwosu CO, PP Madu and WS Richards, 2007. Prevalence and seasonal changes in the population of gastrointestinal nematodes of small ruminants in the semi-arid zone of North-Eastern Nigeria. Vet Parasitol, 144: 118-124.

Pandit BA, RA Shadardar, MA Darzi and AS Bhat, 2003. Survey of gastrointestinal nematdes in sheep of Kashmir Valley. Indian J Small Rum, 9: 39-42.

Pedreira J, AP Silva, RS Andrade, JL Suarez, M Arias, C Lomba, P Diaz, C Lopez, PD Banos and P Morrondo, 2006. Prevalence of gastrointestinal parasites in sheep and parasite control practices in North-West Spain. Prev Vet Med, 75: 56-62.

Raza MA, Z Iqbal, A Jabbar and M Yaseen, 2007. Point prevalence of gastrointestinal helminthiasis in ruminants in southern Punjab, Pakistan. J Helminthol, 81: 323-328.

Raza MA, S Murtaza, HA Bachaya, A Qayyum and MA Zaman, 2010. Point prevalence of *Toxocara vitulorum* in large ruminants slaughtered at Multan abattoir. Pak Vet J, 30: 242-244.

Roberts CW, W Walker and J Alexander, 2001. Sex-associated hormones and immunity to protozoan parasites. Clin Microbiol Rev, 14: 476-488.

Saddiqi HA, Z Iqbal, MN Khan and G Muhammad, 2010. Comparative resistance of sheep breeds to *Haemonchus contortus* in a natural pasture infection. Int J Agric Biol, 12: 739–743.

Seli E and A Arici, 2002. Sex steroids and the immune system. Immunol Allergy Clin North Am, 22: 407-408.

Tariq KA, MZ Chisti, F Ahmad and AS Shawl, 2008. Epidemiology of gastrointestinal nematodes of sheep managed under traditional husbandry system in Kashmir Valley. Vet Parasitol, 158: 138-143.

Tasawar Z, S Ahmad, MH Lashari and CS Hayat, 2010. Prevalence of *Haemonchus contortus* in sheep at Research Centre for Conservation of Sahiwal Cattle (RCCSC) Jehangirabad, District Khanewal, Punjab, Pakistan. Pak J Zool, 42: 735-739.

Wildeus S and AM Zajac, 2005. Gastrointestinal parasitism in hair sheep and meat goat breeds grazing naturally infected pasture. Sheep Goat Res J, 20: 42-46.