Prevalence of *Paramphistomum cervi* in different sheep breeds of Balochistan (Pakistan)

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Abstract

Tehmina, S.; Shahina, R.; Razzaq, A.; Marghazani, I.B.; Khosa, A.N.: ***Prevalence of Paramphistomum cervi in different sheep breeds of Balochistan (Pakistan).*** *Rev. vet. 25: 1, 12-15, 2014.* The prevalence of *Paramphistomum cervi* infestation in Balochi, Babrik and Harnai sheep breeds from Balochistan (Pakistan) was studied during September to December 2010. For this purpose, rumen of slaughtered sheep in Quetta City and surroundings (n=1,200) were examined. Results showed significant differences ($p<0.05$) among age, sex, breed and season of *P. cervi* infestation in animals. The overall *P. cervi* infestation (17.83%) was recorded in animals during the study period. Considering age, a higher prevalence ($p<0.05$) of infestation (23.5%) was observed in animals older than two years-old. On the contrary, lower parasitation ($p<0.05$, 16.66%) was detected in less than one year-old group. Regarding sex, females (22.33%) were found to be more infested ($p<0.05$) than males (17.83%). The Balochi and Harnai sheeps showed higher prevalence of infestation ($p<0.05$) compared to Babrik sheeps. Considering the season of the year, *P. cervi* prevalence was the highest ($p<0.05$, 19.25%) during October, followed by November (15.75%), September (12.75%) and December (12.5%).

Key words: *Paramphistomum cervi*, prevalence, infestation, sheep, Pakistan.

Resumen

Tehmina, S.; Shahina, R.; Razzaq, A.; Marghazani, I.B.; Khosa, A.N.: ***Prevalencia de Paramphistomum cervi en diferentes rodeos ovinos de Balochistan (Pakistan).*** *Rev. vet. 25: 1, 12-15, 2014.* La prevalencia de la infestación por *Paramphistomum cervi* en ovinos de Balochi, Babrik y Harnai, Balochistan (Pakistan) fue estudiada de septiembre a diciembre de 2010. Con este fin, fueron examinados los recintos ruminales de ovinos faenados en la ciudad de Quetta y alrededores (n=1200). Los resultados muestran diferencias significativas ($p<0,05$) entre la edad, sexo, raza y estación del año con respecto a la infestación por *P. cervi*. Durante el período de estudio se comprobó una infestación del 17,83%. Con respecto a la edad, se observó una mayor prevalencia ($p<0,05$) de la infestación (23,5%) en el grupo de dos o más años y baja ($p<0,05$, 16,66%) en los menores de un año de edad. Las ovejas se encontraban altamente infestadas ($p<0,05$, 22,33%) en comparación con los carneros (17,83%). Los animales provenientes de Balochi y Harnai tuvieron una mayor prevalencia ($p<0,05$) que los de Babrik. Con respecto a la época del año, la prevalencia más alta ($p<0,05$, 19,25%) fue durante octubre, seguida por noviembre (15,75%), septiembre (12,75%) y diciembre (12,5%).

Palabras clave: *Paramphistomum cervi*, prevalencia, infestación, ovinos, Pakistan.

INTRODUCTION

Pakistan is an important sheep producing country and ranks 11th in sheep population in the world [3]. There are 27.8 million sheep and 59.9 million goats. Fourteen million and eight hundred thousand (48%) of the first and 12.7 million (22%) of the seconds are raised in Balochistan [4]. It is an established fact that parasitic diseases are one of the principal problems in the development of profitable livestock industry, the climatic conditions and lack of knowledge of the owners, facilitates conditions for infestation with ecto and endo parasites.

About 90% of sheep population in the country suffer some kind of parasitic disease [16]. Prevalence of gastrointestinal helminthes in ruminants has been reported from 25.1 to 92% in distinct areas of Pakistan at different times [1, 2, 7, 9, 10, 17]. Among the helminthes, trematode parasites of ruminant livestock have a worldwide distribution and even have zoonotic importance [15]. The losses in ruminants in Pakistan run into billions of

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rupees in the form of retarded growth, reduced milk production, wool and death in young stock. *Paraphistomum cervi* is one of sheep parasite that adversely affects their health depending upon the number and developmental stages of the helminthes present.

Immature forms of *P. cervi* cause severe damage to duodenal tissue, whereas adult forms injury rumen mild tissue [19]. Paramphistomosis (or amphistomosis) is a disease caused by digenean trematodes of *Paramphistomatidae* family parasitising the rumen of ruminants worldwide. Clinical disease is confined to warmer tropical and sub-tropical areas [6].

Review of parasitic research in Pakistan [8] has revealed that most of the surveys have been carried out for prevalence of parasites around institutions like Faisalabad and Lahore. However, there are certain geographical regions in which livestock population needs to be examined for the presence of gastrointestinal helminthes. But the overall occurrence of helminth parasites of digestive tract, their variation in relation to age and sex of sheep and their seasonal dynamics was not studied adequately.

The objectives of the present study were to determine the prevalence, seasonal dynamics and intensity of *P. cervi* infestation in sheep local breeds of Balochistan in order to identify the taxonomic features of the *Paramphistomum* species recovered from native sheep.

MATERIAL AND METHODS

Sample collection. The prevalence of *P. cervi* infestation in three sheep breeds (Harnai, Babrik and Balochi) were investigated during September to December 2010. Municipal Corporation Abattoir and private butchers slaughter places at Quetta City were visited for collection of materials needed for the study, prior animal slaughter. The compound stomachs of the sheep were obtained after its slaughter in a polythene bag. The bags were also labeled with number, age, sex and breed according to individual sample. The stomachs collected were brought to Arid Zone Research Center Quetta for further processing.

Grouping of samples according to age, sex and breed. A total of 1200 samples from three sheep breeds were collected. Four hundred samples from Harnai, Babrik and Balochi each one. From these, male (n=100) and female (n=100) and two age groups; below one year (n=100) and above one year old (n= 100).

Examination of stomach content. Each compartment of the compound stomach was incised through its entire length. Contents of the rumen, reticulum, omasum and abomasum were separately observed for the presence of parasites by sedimentation or sieving methods as are described in literature [13]. The parasites were put into glass jars. Complete records of the sites of predilection and number of worms were also maintained.

Preservation and staining method for paramphistomes. Specimens collected from the gastric content were stained and identified by using a low power microscope according to the keys of morphological characteristics given in bibliography [11, 20]. The parasites were measured with the help of a calibrator microscope.

Statistical analysis. The data thus obtained on different parameters were statistically analyzed through analyses of variance in general linear model [21]. Arithmetic mean and standard error were observed at 5% level of significance.

RESULTS

A. *Prevalence of P. cervi in sheep.* Over 1200 sheep rumen examined in which 20.08% *P. cervi* infestation were recorded during the study period. The pinkish parasites were found attached to rumen wall.

B. *Age-wise prevalence of P. cervi in three sheep breeds.* Results showed a considerable prevalence of *P. cervi* infestation (23.5%) in two or more years old group. However, it was recorded lower presence (16.66%) in the group of less than one year old (Table 1). Statistical analysis showed significant difference ($p<0.05$) among one year old and more aged sheep.

C. *Sex-wise prevalence of P. cervi in sheep.* Results (Table 2) showed that female sheep were found highly infested (22.33%) than male sheep (17.83%), $p<0.05$.

D. *Breed-wise prevalence of P. cervi in sheep.* Balochi and Harnai sheep breeds showed higher/similar prevalence (21.5%), while in Babrik sheep breed lower prevalence (17.75%) was encountered. Statistical

Table 1. Age-wise prevalence of *P. cervi* in three sheep breeds.

	age (y)	Babrik	Balochi	Harnai	total
examined (n)		200	200	200	600
infested (n)	1	30	34	36	100
%		15	17	18	16.66
examined (n)		200	200	200	600
infested (n)	2	41	51	49	141
%		20.5	25.5	24.5	23.5

References: n: number, %: infested percentage, y: years.

Table 2. Sex-wise prevalence of *P. cervi* in sheep.

sex	male	female
examined (n)	600	600
infested (n)	107	134
%	17.83	22.33

References: n: number, %: infested percentage.

Table 3. Breed-wise prevalence of *P. cervi* in sheep.

	Babrik	Balochi	Harnai
examined (n)	400	400	400
infested (n)	71	85	85
%	17.75	21.5	21.5

References: n: number, %: infested percentage.

Table 4. Prevalence of *P. cervi* during September to December 2010.

month	examined (n)	infested (n)	%
September	300	51	17.00
October	300	77	25.66
November	300	63	21.00
December	300	50	16.66

analysis showed significant difference ($p<0.05$) between higher (Balochi and Harnai) and lower (Babrik) prevalence in sheep breeds (Table 3).

E. ***Prevalence of P. cervi in sheep during September to December 2010.*** Parasite prevalence (Table 4) were found highest (25.66%) during October followed by November (21.0%), September (17.0%) and December (16.66%). Statistical analysis showed significant difference ($p<0.05$) of *P. cervi* prevalence during the four months study period.

DISCUSSION

This study revealed that *P. cervi* infestation is occurring in three sheep breeds (Balochi, Babrik and Harnai) during September to December 2010.

A. ***Overall prevalence of P. cervi in sheep.*** The overall 20.08% *P. cervi* infestation was recorded in sheep. Our findings were comparatively lower than earlier findings [23] in where 65.28% prevalence of *P. cervi* was found in Black Bengal goats slaughtered at different slaughterhouses of Mymensingh district, Bangladesh. A prevalence infestation of 28% was also reported [5] in sheep slaughtered at Maiduguri abattoir, Nigeria. Likewise, 28.57% prevalence of adult *P. cervi* in sheep at Tehsil Jatoi, District Muzaffar Garh, Pakistan was encountered [18]. In Van province, Turkey, higher prevalence (44.3%) of this parasite infestation in sheep was recorded [14].

Other researchers have found lower prevalence in different areas of the world. In natural infested goats, 6.5% to 7.07% prevalence of *P. cervi* was detected in Kashmir Valley [22] whilst 10.98% prevalence in sheep at different areas of Kafr El-Sheikh were reported [12]. The variable prevalence rate might be due to different environmental factors, feeding practices, or health status of the animals. Sheep raised in Balochistan were poorly fed and faced hard environmental factors that might have resulted in higher prevalence of *P. cervi* infestation. High prevalence leads to poor sheep productivity.

B. ***Age-wise prevalence of P. cervi in three sheep breeds.*** The prevalence of this parasite was higher (23.5%) in the group of two or more years old. However, it was recorded lower (16.66%) in animals aged one year old or less. Our findings are in line with the reports [5] that found higher prevalence (28.6%) in adult sheep than in young sheep (22.2%). In Kashmir valley, higher *P. cervi* prevalence (89.58%) was reported in older animals followed by young animals (78.57%) and the lowest (45.0%) in growing animals [22].

Conversely, some workers observed highest infestation in lower age groups and concluded that animals having less than one year, the infestation level decreased [21]. Theese results may be due to the fact that younger animals have less immunity at that age and are in process of developing immunity slowly and hence, are infested with higher rates than adult. However, in some breeds and in certain areas, the results may be different with low infestation in adults than young which may be due to less exposure of the last ones.

C. ***Sex-wise prevalence of P. cervi in sheep.*** Our findings showed higher (22.33%) prevalence in female than male sheep (17.83%). Similar trend of higher infestation rate reported in earlier work with goats [22] where females (75.0%) were found more (1.44 times) susceptible to *P. cervi* infestation than males (67.5%). Likewise, in another study, significantly higher prevalence in females (41.61%) than males (27.45%) were recorded [12]. However, some studies also reported higher infestation in males than female sheep [22].

D. ***Breed-wise prevalence of P. cervi in sheep.*** In the present study, Balochi and Harnai breed sheep showed higher/similar prevalence (21.5%), while Babrik sheep breed showed lower prevalence (17.75%). Earlier work found no differences in prevalence of *P. cervi* with different sheep breeds [5]. However, one research similar to our findings, showed significantly higher infestation in migratory (Bhakarwal) breed than local breeds [22].

E. ***Month-wise prevalence of P. cervi in sheep.*** In the present study, parasite prevalence was highest during October (25.66%), followed by November (21.0%), September (17.0%) and December (16.66%). Other researchers also recorded similar result which revealed highest *P. cervi* infestation in the cattle and sheep during autumn (September to November) season (14.10% and 8.33%, respectively) followed by summer (June to August) season (9.02% and 5.18%, respectively) [14]. Prevalence of *P. cervi* is also reported throughout the year where rate of infestation during monsoon, winter and summer season was 83.64%, 69.23% and 64.0%, respectively [23]. Highest infestation in summer than winter season is also found in some studies [22].

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