

Clinico-Epidemiological Survey on the Prevalence of Gastro-Intestinal Parasites Affecting Buffalo & Cow Calves in District D.I.Khan, Khyber Pakhtunkhwa, Pakistan

Umm-e-Aimen Shah Zeb Khan Amjad Ali, A.Ali M. Rizwan

Veterinary Research & Disease Investigation Center, D.I.Khan & Livestock Research & Development Station
Paharpur, D.I.Khan

Abstract

This study was carried out in the Parasitology section of Veterinary Research & Disease Investigation Center, D. I. Khan from December, 2014 to November, 2015. During the aforesaid study, 1920 fecal samples (960 samples each from Cow calves and Buffalo Calves) were collected and processed. The overall prevalence of gastro-intestinal parasitic infestation was 57.86% in cow and buffalo calves, respectively whereas the incidence rate was recorded as 67 and 48% for buffalo calves and cow calves, respectively and was significant statistically ($P < 0.05$). The prevalence of Nematodes, Cestodes and mixed infestation in buffalo calves was 66.04, 5.65, 28.36% whereas in cow calves it was 59.5, 6.34 & 34.10, respectively with level of significance was higher ($P > 0.05$). The major Nematodes & Cestodes species identified during the study were *Strongyloides*, *Taxocara*, *Haemonchous*, *Ostertagia*, *Bonostomum*, *Oesophagostomum*, *Trichostrongylus*, *Nematodiarus*, *Coperia* and *Monezia*, respectively. In age group (1-6 months) prevalence was significantly higher ($P < 0.05$) in buffalo calves (76.25%) than in cow calves (58.50%) while in age group (7-12 months) the prevalence in buffalo calves was higher (58%) than cow calves (39%) and statistically significant ($P < 0.05$) differences was observed. In grazing and stall fed feeding system, prevalence of gastro-intestinal parasites was recorded as 75 and 58% in buffalo calves and in cow calves recorded as 64.5 and 35.41%. This difference in grazing and stall feeding system in both buffalo and cow calves were statistically significant ($P < 0.05$). In male buffalo and cow calves prevalence of parasitic infestation was significantly higher ($P < 0.05$) whereas in female buffalo & cow calves no significant differences ($P > 0.05$) were recorded. The parasitic infestation rate was recorded higher in summer season as compare to winter and significant relation ($P < 0.05$) was observed with respect to season. Major clinical signs manifested by the affected animals included pot belly, rough body coat, alopecia, retarded growth, diarrhea, sunken eyes, wall licking and pica. The significance level was kept at 05%.

INTRODUCTION

Parasitism is one of the major problems of profitable livestock production throughout the World (Farooq et al., 2012; Lamynet et al., 2012). Helminths are responsible for causing hematological and biochemical disturbances, impaired digestive efficiency (Simposon, 2000. Loss of carcass (27%) and sometimes mild to moderate mortality (Kanyari et al., 2009). Gastro intestinal parasites in calves lead to reduced growth and constantly hampering the development of livestock industry in Pakistan. Although no exact figures of economic losses is available but it is fact that millions of rupees are being lost due to reduced milk yield, rejection of meat and edible offal, depreciation of hides, delayed age at maturity and death particularly in calves and high production cost due to use of drugs (Akbar, 1989; chaudary et al., 1984). Internal parasites interfere with nutrition, growth and production of cattle (Khan et al., 2013). The gastrointestinal infestation is the major cause of stunted growth in growing calves and may lead to death in severe infestation. Different helminths infestation are responsible for about 54.22% calf mortality in Bangladesh (Hossain et al., 1988). Parasitic infestation is one of the most common problem affecting cattle and buffalo of all ages and breeds (Rafiullah et al., 2011; Awraris et al., 2012). The prevalence of parasitic infestation depends directly or indirectly on several factors like species, breed, age, sex, climatic conditions, and nutritional status of the host (Barger et al., 1983; Hossain et al., 2004).

MATERIAL & METHODS

Study area

D.I.Khan is one of the 26 districts of Khyber pakhtunkhwa province of Pakistan. The capital of the district is the town of Dera Ismail Khan. The district has an area of 7326 sq: kilometers (2829 sq: miles) and has population of total 1939000 individuals (2014). The district has been sub divided into five tehsils which contains a total of 47 union councils with tehsil D.I.Khan containing 21, tehsil Kulachi having 4, tehsil Drabin having 4, Parova having 7 & tehsil Paharpur contains 11 union councils respectively. Due to presence of river and cultivatable land, this area harbor a large number of Cattle & Buffalo populations. According to Livestock censuses 2006, district D.I.Khan have Cattle population of 411432 & Buffalo population 205634. This area has extreme of weather, very hot in summer & very cold in winter & the area is divided into four agro-ecological zones including Canal irrigated, Flood Irrigated, (Rudh kahi), Flood irrigated and Kacha (River belt). The arid zone is

also known as Daman in local language.

Sample collection

25 villages of district D.I.Khan including Shorkot, Hissam, Pusha, Mukemshah, Himat, Mandra kalan, Ghulama wala, Koraie, Gomal Kalan, Gomal Khurd, Girsal, Yarik, Petapur, Sedalyan, Hafizabad, Lang khair shah, Gandi umer khan, Baloch wanda, Zinganee, Kutee, Budh, Hathala, Kulachi, & Kaich were the target villages for collection of fecal samples. 04 visits were paid to the selected villages per month and 160 fecal samples, 80 each from cow and buffalo calves were collected randomly. In this way, a total of 1920 fecal samples (920 each buffalo and cow calves) were directly collected from rectum of the animals concerned. Before collection, the animals were properly restrained and all possible hygienic measures including wearing of apron, hand gloves and rubber gumboots were adopted to avoid contamination. About 20-25 grams of fecal samples were collected from each buffalo and cow calves. Each samples was then kept in separate polythene bag, tied carefully and numbered properly and the samples were preserved in 10% Formalin. The correctly labeled and properly numbered polythene bags containing the fecal samples with all required information on the age, sex, of the buffalo and cow calves, season of the year, feeding practices, level of farmers education (literate/illiterate) deworming history and clinical signs in the affected animals were carefully recorded.

Processing of samples

The fecal samples collected during the study were examined by Direct Method, Sedimentation method, salt flotation method as described by Soulby (1982).

Statistical Analysis

Data thus collected were arranged in Ms Office Excel and statistically analyzed by Chi square (χ^2) for prevalence at a probability level ≤ 0.05 using Statistical Package for Social Services (SPSS) version 16.0.

RESULTS AND DISCUSSION

The present study was carried out in the Parasitology Section the Veterinary Research & Disease Investigation Center, D.I.Khan from December 2015 to November 2016. During the study total of 1920 samples were collected from the cow and buffalo calves and were processed. The findings of the study revealed that the prevalence of Gastro intestinal parasites were very high in buffalo and cow calves population of district D.I.Khan. The results of the study has shown that the prevalence of gastro intestinal parasites were found significantly higher ($P < 0.05$) in buffalo calve (67%) as compared to the cow calves (48%) (Table-1). The major nematodes and Cestodes species identified during the study were *Strongyloides*, *Toxocara*, *Haemonchus*, *Ostertagis*, *Bunostomum*, *Oesophagostomum*, *Trichostrongylus*, *Nematodirus*, *Cooperia*, and *Monezia* respectively. In the age group (1-6 months) prevalence was higher significantly ($P < 0.05$) in buffalo calves (76.25%) than in cow calves (58.50%) while in age group (7-12 months) the prevalence in buffalo calves was higher (58%) than cow calves (39%) being lower than in buffalo and cow calves of age group 1-6 months (Table-2). Sex wise prevalence of Gastro-intestinal parasites was highly significant ($P < 0.05$) in male buffalo and cow calves animals being 79% & was least significant ($P > 0.05$) in female buffalo and cow calves animals being 62.50% respectively (Table-3). With respect to feeding system, prevalence was found statistically significant in grazing and stall fed buffalo and cow calves showing value ($P < 0.05$) (Table-4). Season is an important indicator for the intestinal parasitism. In the present study prevalence of gastro-intestinal parasites were recorded significantly higher ($P < 0.05$) in summer season as compared to winter (Table-5). The prevalence of Nematodes, Cestodes & mixed infestation were found least significant ($P > 0.05$) reflecting 69.13, 7, 24 & 65%, 6.8%, 28.20% in buffalo & cow calves respectively in age group 1-6 months while the prevalence of Nematodes, Cestodes & mixed infestation was also found insignificant with greater P value then level of significance ($P > 0.05$) showing 62.94%, 4.31%, 32.73% & 54%, 5.88%, 40% in buffalo and cow calves respectively in age group of 7-12 months (Table-6). The major clinical signs observed in positive animals were Pot bally, rough body coat, Alopecia, Retarded growth, Diarrhea, Sunken eyes, licking of walls & Pica.

In the present research study the high prevalence of endo parasitism in buffalo & cow calves could be lack of calf management related practices and careless attitude of the farmer community in calves rearing. Other factor could be poverty and educational level of the farmers of the area which is permanent hindrance in timely deworming and sparing proper share of milk for the new born calves. Kakar & Kakar sulemankhel (2008) has reported that high incidence of parasitism in calves under field conditions is mainly due to non-adoption of prophylactic measures as regular deworming with good quality dewormers at recommended doses is not in practice. It was also supported by Iqbal (1987) who pointed out that buffalo and cow calves are the neglected class of animals at the farmer level.

The findings of the present study are in close agreement with the findings of Amir (1994) and Mourad et al (1985) who reported higher prevalence of the gastro intestinal parasites in buffalo calves than cow calves. In our

present study, the eggs of Nematodes and Cestodes identified were almost the same as pointed by various previous studies (Masood & Majid 1989), Javed et al 1993 & Rehman et al 2009. They observed the presence of *Haemonchus contortus*, *Ostertagia ostertagi*, *Bunostomum falicatum*, *Oesophagostomum radiatum*, *Trichostrongylus* species, *Nematodirus* species, *Cooperia* species, *Monizia banideni* & *Monizia expansa* eggs in cow and buffalo calves. The findings of our study are also in close agreement with findings of Javed et al 1993, as he observed 64.5% prevalence of gastro intestinal parasites in buffalo and cow calves. The main species of parasites observed by *Haemonchus contortus*, *Ostertagia ostertagi*, *Bunostomum falicatum*, *Oesophagostomum radiatum* & strongyloid species that are in close agreement with the findings of present study. However higher prevalence in buffalo calves as compared to cow calves could be due to differences in feeding habits of the two species. The same justification was also supported by Kakar & Kakar sulemankhel 2008. The higher prevalence of gastro intestinal parasites in buffalo and cow calves up to the age of six months in this study is in close agreement to that of study conducted by Bilal et al 2009 who reported 88.33% and 59.46% prevalence of gastro intestinal parasites in buffalo and cow calves. The higher incidence of the gastro intestinal parasites in buffalo and cow calves up to the age of six months may be due to calves' habits to lick other animals, mud and dung and this may lead to worm infestation in this group of age. Other reason could be due to the fact that milk let down through calves is common practice in the field and teat washing is done after let down and all the dung, urine adheres on dam teats is ingested by the young calves resulting in worm infestation. In the present study the prevalence of the Nematodes, Cestodes and mixed infestation was 69.13%, 07%, 24% and 65%, 6.8%, 28.20% in buffalo and cow calves respectively in age group 1-6 months whereas the prevalence of Nematodes, Cestodes and mixed infestation was 62.94%, 4.31%, 32.73% and 54%, 5.88%, 40% in buffalo and cow calves respectively in age group of 7-12 months which was in close agreement to the findings recorded by Bilal et al, 2009. In the present study, sex wise prevalence of gastro intestinal parasitic infestation was 79% and 62.50% in male buffalo and cow calves respectively, while the prevalence was 53% and 55% for female buffalo and cow calves respectively which is in close agreement to that of Bilal et al, 2009 who recorded the same findings. The higher prevalence in male buffalo and cow calves could be due to neglected attitude of the farmers towards the management of male calves and preference towards the management of female calves in the study area. The prevalence of gastro intestinal parasites in buffalo and cow calves was 75.78% and 70.37% in months of May, June, July and August, while the prevalence was 32.91% and 30.41% in months of November, December and January in buffalo and cow calves respectively. The high prevalence in months of May, June, July and August could be due to high temperature and humidity being favorable conditions for the development of eggs into larvae.

Table-1: Overall prevalence of Gastro-Intestinal Parasites in Buffalo and Cow Calves.

Species	N	Prevalence (%)	P-value
Buffalo calves	960	67	0.000
Cow calves	960	48	

N=Total number of samples

Table -2: Age wise prevalence of Gastro-Intestinal Parasites in Buffalo and Cow calves

Species	Age groups	N	% Prevalence	P-value
Buffalo Calves	1-6 months	480	76.25%	0.000
Cow Calves	1-6 Months	480	58.50%	
Buffalo Calves	7-12 Months	480	58%	0.000
Cow Calves	7-12 Months	480	39%	

N=Total number of samples

Table -3: Sex wise prevalence of Gastro-Intestinal Parasites In Buffalo and Cow calves

Species	Sex	N	Prevalence (%)	P-value
Buffalo Calves	Male	240	79%	0.001
Cow Calves	Male	240	62.50	
Buffalo Calves	Female	240	53	0.71
Cow Calves	Female	240	55%	

N=Total number of samples

Table -4: Feeding wise prevalence of Gastro-Intestinal Parasites in Buffalo and Cow calves

Feeding System	Species	N	% Prevalence	P-value
Grazing	Buffalo Calves	480	75%	0.000
Stall Fed	Buffalo Calves	480	58%	
Grazing	Cow Calves	480	64.58%	0.000
Stall Fed	Cow Calves	480	35.41%	

N=Total number of samples

Table-5: Month/Season wise prevalence of Gastro-Intestinal Parasites in Buffalo and Cow calves

Species	Months/Season	N	% Prevalence	P-value
Buff Calves	Summer	640	75.18%	0.46
Cow Calves	Summer	640	70.37%	
Buff Calves	Winter	480	32.91%	0.65
Cow Calves	Winter		30.41%	

N=Total number of samples

Table -6: Prevalence of various types of Gastro-Intestinal Parasites in Buffalo and Cow calves

Variables	Category	Species	Nematodes		Cestodes		Mixed infection	
			P (%)	P-value	P (%)	P-value	P (%)	P-value
Age	1-6 months	Buff calves	69.1	0.65	7	0.78	24	0.62
		Cow calves	65		6.8		28.2	
	7-12 months	Buff calves	62.9	0.25	4.3	0.74	32.7	0.37
		Cow calves	54		5.8		40	
Sex	Male	Buff calves	68.2	0.76	10.1	0.61	21.6	0.51
		Cow calves	65.3		7.3		27.3	
	Female	Buff calves	57.4	0.01	14.9	0.01	27.5	0.32
		Cow calves	75		3.7		21.2	
Feeding system	Grazing	Buff calves	65.9	0.76	12.1	0.47	21.9	0.33
		Cow calves	63		7.7		29.4	
	Stall fed	Buff calves	60	0.66	14	0.09	26	0.09
		Cow calves	55.8		6		38.2	

P=Prevalence

REFERENCES

1. Akbar, M. (1989). A study of gastric trematodes in buffalo and taxonomy of the species of the genus paramphistomum. M.Sc. (Hons.) Thesis, Deptt. Parasitology, College of Veterinary Sciences Lahore.
2. Amir, M.I. (1994). Study on the incidence of gastro-intestinal helminthes and comparative efficacy of anthelmintic in buffalo calves. M.Sc. (Hons.) Thesis, Faculty of Veterinary Sciences, Uni. Agri. Faisalabad.
3. Anwar, A.H., S.N. Buriro and A. Phulan (1995). A hydatidosis veterinary perspective in Pakistan. The Veterinarian, 11-14.
4. Barger, I.A., 1982. Helminths parasites and animal production. In: Biology and control of endo parasites. (eds. L.E.A. Symons, A.D. Donald and J.K. Dineen), Academic Press, Sydney, pp. 133-155.
5. Barger, I.A., 1993. Influence of Sex and reproductive status on susceptibility of ruminants to nematode parasitism, Int. J. Parasitology, 23: 463-469.
6. Bilal, M.Q.A. Hameed and T. Ahmad (2009). Prevalence of Gastro-Intestinal Parasites in Buffalo and Cow calves in rural areas of Toba Tek Singh, Pakistan. The Journal of Animal and Plant Sciences 19(2): 2009. Pages: 67-70 ISSN: 1018-7081.
7. Chaudhry, N.I., M.S. Durrani and T. Aziz (1984). The incidence of gastrointestinal parasites in buffaloes of Azad Kashmir, Pakistan. Vet. J., 4(1): 60-61.
8. Farooq, Z., S. Mushtaq, Z. Iqbal and S. Akhtar, 2012. Parasitic helminths of domesticated and wild ruminants in Cholistan desert of Pakistan. Int. J. Biol., 14: 63-68.
9. Iqbal, M.M. (1987). Survey of gastrointestinal parasites of buffalo in Faisalabad and evaluation of efficacy of Albendazole against these infections. M.Sc. (Hons.) Thesis, Deptt. Clin. Med. Surg. Univ. Agri., Faisalabad.
10. Irfan, M. (1984). Key note address on effect of parasitism in lower livestock population. Pakistan Vet. J., 4(1): 25-27.
11. Javed, S., R. Ahmad, R. Anjum and S.U. Rehman (1993). Prevalence of endo parasites in buffaloes and cattle, Pakistan Vet. J., 13(2): 88-89.

12. Kakar, M.N, and J.K. Kakarsulemankhel (2008). Prevalence of endo parasites in cows and buffaloes of Quetta, Pakistan. *Pakistan Vet. J.*, 28(1): 34-36.
13. Kanyari, P.W.N., J.M. Kagira and R.J. Mhoma, 2009. Prevalence and intensity of endo-parasites in small ruminants kept by farmers in Kisumu Municipality, Kenya. *Livestock Res. Rural Dev.*, 21: 1-10.
14. Lamy, E., S.V. Harten, E. Sales Baptista, M.M, Guerra and A.M Almeida, 2012. Factors influencing livestock productivity. In: *Environmental stress and Amelioration in Livestock Production*. Pp: 19-51. S. Veerasamy Sejian, S.M.K. Naqvi, T. Ezeji, J. Lakritz and R. Lal (Eds). Springer- Verlag, Berlin, Germany.
15. Masood, F.S. and A. Majid (1989). Five year survey on ascariasis in buffaloes and cow calves in Multan Division, Pakistan. *Vet. J.*, 4(2): 63-65.
16. Mourad, M.I., S.A. Abdullah and T.E. Allowy (1985). Comparative study on gastrointestinal parasitism of cattle and buffalo with special reference to hematological changes as Assiut Governorate. *Assiut Vet. Med. J.* 15: 163-166.
17. Rafiullah, Turi AA, Sajid A. Shah SR, Ahmad S and Shahid M. 2011. Prevalence of gastrointestinal tract parasites in cattle of Khyber Pakhtunkhwa. *Journal of Agricultural and Biological Sciences*. 6(9) : 9-15.
18. Rehman, K., K. Javed, M.T. Tunio and Z.H. Kuthu (2009). Passive surveillance of gastrointestinal parasites in buffalo of Mandi Bahauddin and Gujrat Districts of the Punjab. *The J. Anim. Plant. Sci.* 19(1): 17-19.
19. Simpson, H.V., 2000. Pathophysiology of abomasal parasites: *Vet. J.* 160: 177-191.
20. Soulsby, E.J.L., (1982). *Helminths, Arthropods and Protozoa of the Domesticated animals*. 7th Ed. The English Language Book Soc. & Bailliere Tindall, London.