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Short Communication

OCCURRENCE OF PARAMPHISTOMOSIS IN CATTLE AND BUFFALOES WITH DIGESTIVE DISORDERS IN AMBALA DISTRICT OF HARYANA

VANDNA BHANOT* and RENU GUPTA[1]
Disease Investigation Laboratory, Ambala, [1]Department of Veterinary Public Health and Epidemiology,
Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar-125004, India

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SUMMARY

Epidemiological studies on occurrence of paramphistomiasis in cattle and buffaloes with digestive disorders in Ambala district of Haryana were carried out. A total of 557 faecal samples were examined from bovines during July 2016 to June 2017. The occurrence of paramphistomiasis was 12.21% (95% CI; 9.61-15.22) in cattle and buffalo. Occurrence of paramphistome eggs was found higher in buffaloes as compared to cows. Significant association was observed between season and detection of paramphistome eggs in the faeces. Maximum positivity was observed in summer season followed by rainy and spring season. Significant difference was observed between diarrheic and non-diarrheic animals in relation to presence of paramphistome eggs in the faeces. No such significant associations were observed for other variables i.e., species, presence of anorexia, indigestion, reduced growth rate and weight loss.

Keywords: Diarrhoea, Occurrence, Paramphistomosis, Season

Paramphistomosis/Amphistomiasis is an important parasitic disease of livestock, which causes heavy economic losses. Ruminant amphistomosis a severe infection of cattle, buffalo, sheep, goats and other wild ruminants with immature amphistomes in the small intestines of immunologically incompetent hosts and considered as a copacetic obstacle in health and production performance of animals throughout the globe (Horak, 2009). In India its occurrence has been reported from different states (Hassan *et al.*, 2005; Satyanarayan *et al.*, 2007; Shukla *et al.*, 2012). A major distinctive feature of this gastrointestinal parasitism is the loss of protein into the gut and increased rates of gastrointestinal tissue protein metabolism and a net movement of amino acid nitrogen from muscles and skin to liver and gastrointestinal tract which decreases their availability for growth, milk and wool production. Haryana state has a population of 15,52,361 cattle and 59,53,228 buffaloes (Anonymous, 2007) and these animals are responsible for milk production which in turn augments the income of livestock owners and also fulfils the nutritional need of human population. The present study involves the epidemiology of paramphistomosis in cattle and buffaloes of Ambala District of Haryana from July 2016 to June 2017.

From July 2016 to June 2017, faecal samples of 245 cows and 312 buffaloes brought to Disease Investigation laboratory, LUVAS, Ambala for examination with indications of digestive disorders (diarrhoea, anorexia, bloat, and indigestion) were selected for this study. The faecal samples were processed as per standard procedure for sedimentation and flotation techniques (Urquhart *et al.*, 1987). The slides were prepared and examined under low (10x) and high (40 x) power of microscope for the presence of parasitic infections. Characteristics of the variables recorded for individual animals are given in Table 1. Association of different variables in relation to presence of paramphistome eggs in the faeces was analysed by chi-square test of independence. Logistic regression analysis was applied to calculate Odds ratios (ORs) for association of detection of paramphistome eggs in faeces and different variables. Four models were applied i.e. i) crude, ii) adjusted for season, iii) adjusted for diarrhoea and iv) adjusted for season and diarrhoea. All the statistical analysis was carried out using STATA/IC 15 (StataCorp LLC, CollegeStation, Texas, USA).

Coprological examination revealed the overall occurrence of paramphistome eggs to be 12.21% (95% CI; 9.61-15.22) in cattle and buffalo during July 2016 to June 2017 (Table 1). Detection of paramphistome eggs was found higher (13.74%) in buffaloes as compared to cow (10.25%) but the difference was statistically non-significant (p=0.213). Chaudhri *et al.* (2014) reported significantly higher infection of paramphistomes (14.2%) in buffaloes than cross-bred cows. The overall occurrence (12.21%) recorded in the present study is comparable to 12.8 percent as recorded by Chaudhri *et al.* (2014) in diarrhoeic cows and buffaloes of eastern Haryana. These results are also in agreement with those of Kumar *et al.* (2011) but higher prevalence of paramphistomiasis in cattle (9.73%) was observed in hills as compared to buffaloes (7.44%). These variations in the occurrence may be due to the different geographical locations, time periods and various methods of sample analysis.

Significant association was observed between season and detection of paramphistome eggs in the faeces, χ^2 (3, N = 557) = 19.217, p =<0.001. Maximum positivity

*Corresponding Author: vandna.van@gmail.com

Table 1

Association of different variables in relation to presence of paramphistome eggs in the faeces

Variable	Category (n)	Positive for paramhistome egg (%)	(95%) CI	χ^2 (df)	p
Faecal examination results	557	68 (12.21)	(9.61-15.22)		
Species				1.560 (1)	0.213
	Cattle (244)	25 (10.25)	(6.74-14.75)		
	Buffalo (313)	43 (13.74)	(10.12-18.06)		
Season				19.217 (3)	**<0.001**
	Rainy (175)	28 (16.00)	(10.90-22.29)		
	Spring (122)	7 (5.74)	(2.34-11.46)		
	Summer (158)	29 (18.35)	(12.65-25.28)		
	Winter (102)	4 (3.92)	(1.08-9.74)		
Anorexia				0.0001 (1)	0.991
	Absent (328)	40 (12.20)	(8.86-16.23)		
	Present (229)	28 (12.23)	(8.28-17.18)		
Diarrhoea				10.927 (1)	**0.001**
	Absent (243)	17 (7.00)	(4.13-10.96)		
	Present (314)	51 (16.24)	(12.34-20.80)		
Indigestion				0.156 (1)	0.694
	Absent (483)	60 (12.42)	(9.61-15.70)		
	Present (74)	8 (10.81)	(4.78-20.19)		
Reduced Growth Rate				0.805 (1)	0.370
	Absent (528)	66 (12.50)	(9.80-15.63)		
	Present (29)	2 (6.90)	(0.85-22.77)		
Weight Loss				0.594 (1)	0.441
	Absent (520)	62 (11.92)	(9.26-15.02)		
	Present (37)	6 (16.22)	(6.19-32.01)		

was observed in summer season (18.35%; 95% CI- 12.65-25.28) followed by rainy (16%; 95% CI-10.90-22.29), spring season (5.74%; 95% CI-2.34-11.46) whereas in winter season the occurrence was minimum (3.92%; 95% CI- 1.08-9.74). Significant difference was observed between diarrheic and non-diarrheic animals in relation to presence of paramphistome eggs in the faeces, χ^2 (1, N = 557) = 10.927, p =0.001 (Table 1). No such significant associations were observed for other variables i.e., species, presence of anorexia, indigestion, reduced growth rate and weight loss. Percentage of paramhistome eggs was recorded higher in buffaloes than cow in all the seasons. Species wise highest occurrence of paramphistomiasis was observed in summer season both in cow and buffaloes. Chaudhary *et al.* (2014) observed higher prevalence in monsoon and post monsoon (12.9%) followed by summer (11.3%) and least in winter (6.06%). Results are in accordance with Yadav *et al.* (2010) who observed higher prevalence in summer (12.65%) and rainy (12.35%) and the least during winter (6.46%). The higher occurrence in summer and rainy season may be due to husbandry practice by the farmers and they allow their animal in pasture. Moreover, population of snail intermediate hosts is also maximum during rainy season. In winter season animals are mostly stall fed so as to avoid cold and in summer season farmers allow their animals to graze outside increasing the possibility of picking infection as the animal have access to snail intermediate hosts (Jyoti *et al.*, 2012).The highest occurrence of amphistomes during summer months may be attributed to the fact that during summer season temperature slowly increases above 20 ºC which is a favourable temperature for larval development in intermediate host (Mir *et al.*, 2008). Odds ratios for association of different variables with presence of paramphistome eggs in faeces are given in fig. 1.

Odds of detection of paramphistome eggs in summer and rainy season was higher as compared to winter season (OR - summer- 5.51, p=0.002; rainy- 4.67, p=0.005). Further, chances of detection of eggs was 2.58 (95% CI- 1.45-4.59; p=0.001) times in diarrheic animals than in non-diarrheic animals. Odds ratio was significantly altered for presence of anorexia in model adjusted for diarrhoea (OR-2.32, 95% CI-1.22-4.40; p=0.010) and adjusted for season and diarrhoea (OR-2.33, 95% CI-1.23-4.43; p=0.010) but not in model adjusted for season (OR-1.01, 95% CI-0.61-1.70; p=0.957). This indicates that diarrhoea has confounding effect on association between presence of anorexia and detection of paramphistome eggs in faeces. No significant association was observed for detection of paramphistome eggs in faeces and other

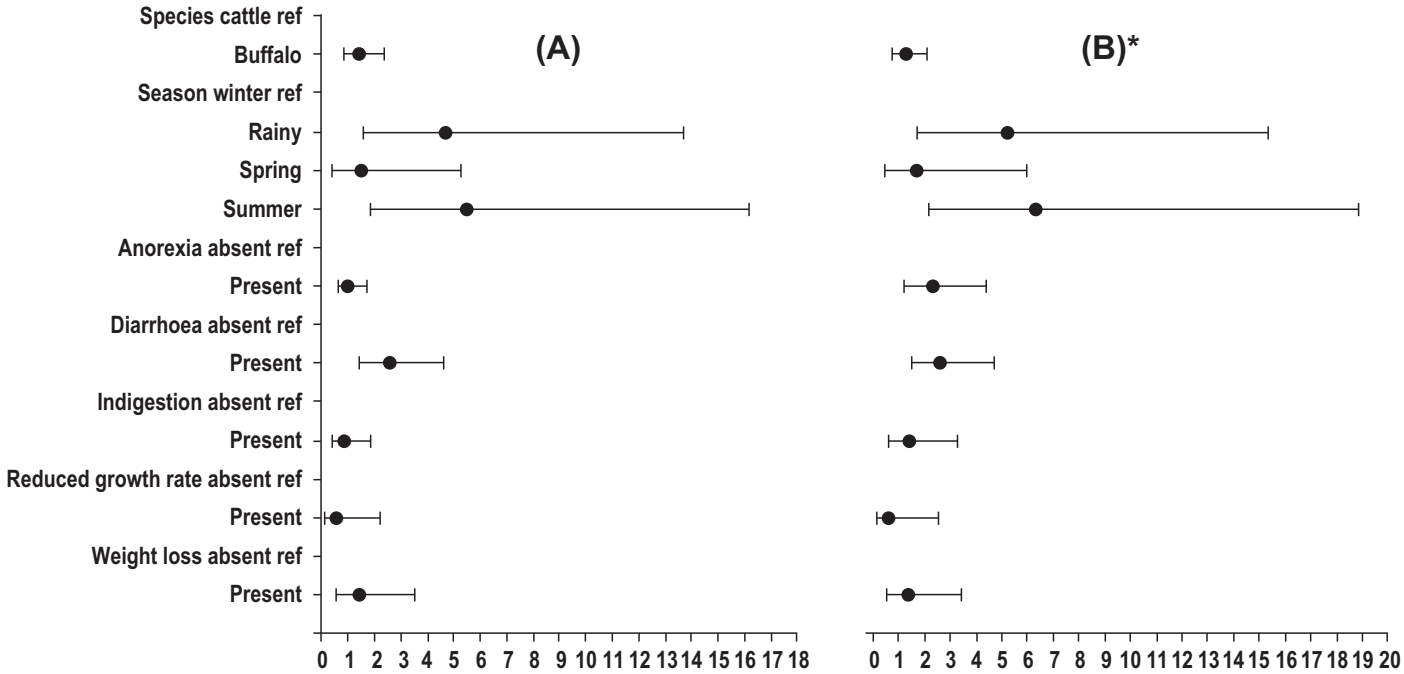

Fig. 1. Results from logistic regression modeling the association of different variables and detection of paramphistome eggs in faeces; A- crude model, B- model adjusted for season and diarrhoea. The x-axis represents odds ratios. The horizontal lines represent 95% confidence intervals for the estimated odds ratios. *Seasons-adjusted for diarrhoea only; Diarrhoea- adjusted for season only

variables in the study (Table 1 and Fig. 1).

The overall monthly detection percentage in bovines revealed highest in April (20.7%), June (20.6%) and September (19%) and lowest in January (2.4%) and February (2.8%). As per Yadav *et al.* (2010), monthly prevalence of amphiostomosis indicated peak prevalence in cattle in cattle in May (34%) and in buffaloes in July (37.26%). The study of Chaudhary *et al.* (2014) on monthly prevalence of paramphistomiasis in all four domestic ruminants indicated highest egg per gram of faeces (EPG) in August (3.65%), July (3.51%) and June (2.49%) and lowest during December (0.7%), November (1.12%) and October (1.15%). It is concluded from the study that cow and buffaloes should not be allowed to graze near water bodies during summer and rainy season as environmental conditions are conducive during this time for development of larvae and be dewormed at least once during April/May and again during August/September especially in grazing animals.

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