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Seasonal incidence of coccidial infection in Barbari and Jamunapari goats of semi-arid region, India

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Abstract

The seasonal occurrence of coccidian oocysts was determined in Barbari and Jamunapari goats at Central Institute for Research on Goats, Makhdoom, Mathura, semi-arid regions of India. A total of 474 goats were examined and 458 (96.62%) were found positive for coccidial infection during the year 2012-13. The study was performed in two different seasons in season I [autumn, (November, December)] and season II [spring, (March, April)]. In autumn season, 259 samples (153 Barbari and 106 Jamunapari), whereas in spring season 215 faecal samples (110 Barbari and 105 Jamunapari) were collected and number of oocysts per gram (OPG) of faeces was determined. The mean OPG value for the Barbari (1382.7) was found to be higher than the mean OPG value for jamunapari goats (1017.0) in autumn season while, in spring season, higher values were recorded in Jamunapari goats (1023.1). It is expected that the findings of the present study will be useful to minimize and control the incidence of coccidiosis in the goats of semi-arid regions.

Keywords: coccidia faeces goats OPG season semi-arid regions

1. Introduction

India possesses the goat population of 135.17 million ^[10]. Coccidiosis is distributed all over the world and one of the most economically important protozoan diseases that causes lowering the production in goat ^[16, 3]. Coccidiosis is caused by host specific *Eimeria* species ^[9]. The parasite invades and destroys the intestinal mucosa of the hosts, causing anaemia, electrolyte loss and poor absorption of nutrients. The most common clinical sign includes; diarrhoea, rough hair coat, poor weight gain and weakness ^[16]. The small ruminants like goats are resistant to adverse environmental conditions, and endure semi-arid and dry areas far better than other farm animals. Goat coccidiosis causes high mortality in kids that may reach 58%. Coccidiosis has been the second major cause of mortality, next to pneumonia, in kids aged < 90 days. With the increasing of world population and economic development, the global demand for meat, milk and other animal products is also increases. The knowledge of prevalence of different *Eimeria* species in a flock is helpful in evaluating the infection potential, minimizing the economic losses and designing strategies for successful control programme ^[17]. The goats are resistant to adverse environmental conditions, and endure semi-arid and dry areas far better than other farm animals ^[2]. There is paucity of literature available on the seasonal occurrence of coccidiosis in the goats from semi-arid regions. Keeping this point in the background the objective of this study was to determine the seasonal occurrence of coccidial oocyst in goats of semi-arid region.

2. Materials and Methods

The studied herd consisted of 263 Barbari and 211 Jamunapari goats at Central Institute for Research on Goats, Makhdoom, Mathura, semi-arid regions of India. The study was performed in two different seasons in season I [autumn, (November, December)] and season II [spring, (March, April)] during the year 2012-13. The animals were housed separately with partially dirt floor. All the animals were kept in semi intensive system and were let out to graze in the morning and afternoon on daily basis. Animals used to graze on the pasture surrounding the herd. Faecal samples were collected randomly from 153 Barbari and 106 Jamunapari goats in autumn season whereas in spring season the faecal samples from 110 Barbari and 105 Jamunapari goats were screened. Faeces were collected directly from rectum of the respective goats.

All the goats under study were below 6 months of the age more or less (weaned but not served goats). Modified Mc Master technique was used to calculate the number of oocyst per gram (OPG) of faeces [13].

Statistical analysis of the results was performed by ANOVA using SPSS software, version 17.0, SPSS Inc., Chicago.

3. Results and Discussion

A total of 474 samples were collected and examined for coccidiosis from 263 Barbari and 211 Jamunapari goats in two different seasons viz, autumn and spring. Out of these 474 samples, 458 (96.62%) were found positive for coccidia infection. The overall incidence was found to be very high and is in accordance with those earlier reports [3, 7]. Coccidial infection in small ruminants has been reported worldwide [5, 11, 8, 1, 12, 6]. The higher prevalence of coccidiosis might be attributed to the breeding intensification, high stocking rates, dampy litter, muddy zones and poor hygiene in premises and stress factors associated with physiological and nutritional status that leads to the higher intensity of excretion of coccidian oocyst. The mean OPG (1382.7) of Barbari goats were found higher (1017.0) than Jamunapari in autumn season while, it was lower in spring season (Table 1). OPG values were observed constantly higher in Barbari as compared to Jamunapari goats. Even the highest OPG value of 8500 (data not shown) was observed in Jamunapari goats. This might be attributed to higher incidence of twins or triplet that lowers the immunity of goats and thus, making them susceptible for infection [4]. Sixteen species of coccidia have

been reported from goats [14]. In the present study no species identification of *Eimeria* was done as clinical sign of coccidiosis were not evident. *Eimeria* sps identification is not routinely carried out in clinical practice and therefore, not reported in this study. The numbers of samples falling within specific OPG ranges are mentioned in Table 1. The ranges (100-1000) of OPG was found higher in number in both the season; with maximum percentage of 76.4 in autumn season and 75.5 in spring season (Table 1, Figure 1). Although, the initial infection may produce a maximum number of oocyst counts and as the immunity develops oocyst output is reduced to a considerable amount [15]. The developed immunity is seldom absolute and the goat often continuously pick-up the infection and thus, remain a source of infection for young population [9]. The higher incidence of coccidia infection throughout study period was expected as the age of animals along with the season and other managerial factors significantly favours the infection in that particular area.

4. Conclusions

The present study revealed that the seasonal occurrence of coccidia infection in goats of semi-arid region is very high and may turn out to be pathogenic to the goats. The incidence of coccidian throughout the period of study was expected and justified, too, since under natural conditions, repeated exposure lead to acquired immunity in the animals in due course. It is necessary to carry out control strategies in the studied area that will be helpful for goat production.

Table 1: Number of faecal samples, collected from Barbari and Jamunapari goats of semi-arid region, India, falling within specific oocysts per gram of faeces (OPG) ranges (percentage in bracket; maximums underlined).

	Season I (autumn)		Season II (spring)	
	Barbari (n=153)	Jamunapari (n=106)	Barbari (n=110)	Jamunapari (n=105)
OPG range				
0	-	-	15 (13.6)	1 (1)
100-1000	54 (35.3)	81 (76.4)	83 (75.5)	48 (45.7)
1100-2000	53 (34.6)	9 (8.5)	11 (10)	19 (18.1)
2100-3000	17 (11.1)	7 (6.6)	1 (1)	13 (12.4)
3100-4000	11 (7.2)	6 (5.7)	-	5 (4.8)
4100-5000	7 (4.6)	-	-	5 (4.8)
5100-6000	2 (1.3)	2 (1.9)	-	3 (2.9)
6100-7000	4 (2.6)	1 (1)	-	6 (5.7)
7100-8000	4 (2.6)	-	-	4 (3.8)
8000+	1 (1)	-	-	1 (1)
Mean OPG	1382.7	1017.0	771.8	1023.1
SD	607.0	311.5	444.8	850.0

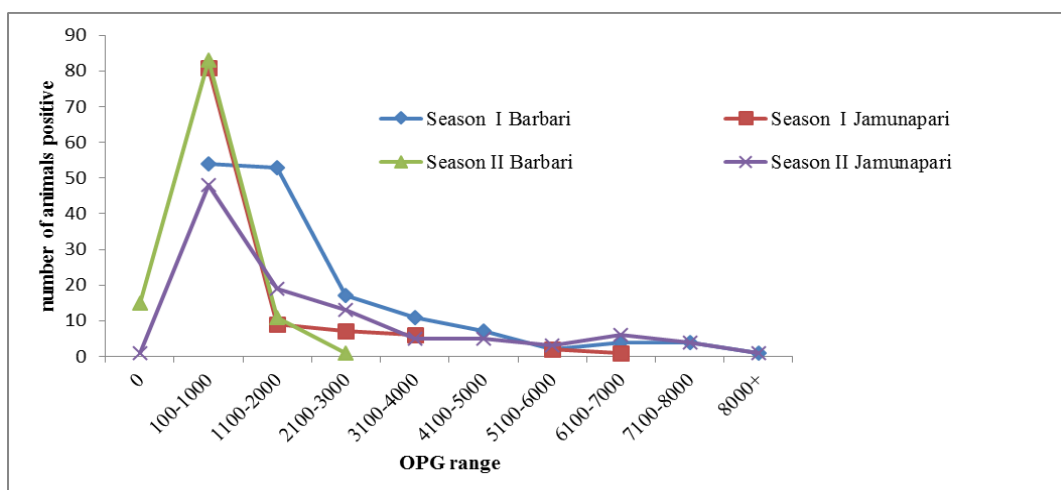


Fig 1: The oocysts per gram (OPG) range for Barbari and Jamunapari goats of semi-arid region, India.

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