Occurrence and distribution patterns of the diseases of goat in Dhaka, Bangladesh

Ahsan Raquib[1,2]   Mohammod Misbah Uddin[2]   Md. Shahidur Rahman Chowdhury[1]

Md. Mukter Hossain[1],   Md. Mahfujur Rahman[1],

[1] Department of Medicine, Faculty of Veterinary, Animal and Biomedical Sciences, Sylhet Agricultural University, Sylhet, Bangladesh

[2] Department of Epidemiology and Public Health, Faculty of Veterinary, Anim. and Biomed. Sci., Sylhet Agricultural Univ., Sylhet, Bangladesh

ABSTRACT

Objective: The study was conducted to determine the occurrence and distribution patterns of diseases of goat in Dhaka, Bangladesh during the period of January 2018 to December 2018.

Materials and Methods: A total of 452 goats were recorded during the study period. The diseases were diagnosed based on clinical signs, patient owners complain and laboratory findings. The prevalence was measured according to season and age of the goats which were studied. Statistical analysis was done by Chi-square test and P-value was calculated by using SPSS 25 for windows (SPSS, Inc., Chicago, IL).

Results: In this study, 381 (84.29%) goats were found to be diseased from 452 visited goats at Central veterinary Hospital (CVH), Dhaka. The highest prevalence was found with worm infestation (31.42%) followed by PPR (13.72%), miscellaneous (ruminal acidosis, disuria, repeat breeding) (12.16%), pneumonia (10.18%), dermatitis (4.20%), enteritis (3.76%), urolithiasis (3.09%), bloat (2.65%), mastitis (1.55%), tetanus (1.11%) and protozoal diseases (0.44%). Rainy season represented the highest (86.11%) prevalence of goat diseases followed by winter season (82.85%) and summer season (82.44%). PPR was significantly (p<0.05) more prevalent in winter season than other two seasons. In this study, Goats had significantly higher (p<0.01) prevalence of worm infestation in the summer season (29.00%) and the rainy season (39.35%) and in all three (0-12 months, 13-24 months and >24 months) age groups with 21.64%, 45.06%, and 32.20% respectively. Prevalence of mastitis was lowest in 0-12 months (0.43%) and 13-24 months (0.62%) age group but the prevalence of tetanus was lowest in above 24 months (1.69%) age group.

Conclusions: These findings will help to know about age-wise and season wise variation of different diseases of goat in this area and will help to execute proper preventive measures against those diseases.

Keywords: Occurrence, Distribution, Diseases, Goat, Bangladesh

INTRODUCTION

Goat is one of the most important livestock species in Bangladesh because of their short generation intervals, higher rates of prolificacy and the ease with which the goats and their products can be marketed. Goat is called "the cow of poor people" because people like low-income farmers, landless labors and distress women who can't afford to rear cattle, rearing goats can be very useful to them. Goat is easily reared, prolific in climate especially in arid zones (Banerjee, 2004). As subordinate occupation, farmers rear goats to supplement their livelihood. Goat farming can play vital role in improving farmers living status by increasing their income and can contributes substantially in the national economy. It provides the principal dietary animal protein in the form of meat and milk to promote national health. According to the food and Agricultural Organization (FAO), meat and skin of

goats contribute 38% and 28% of whole livestock meat and skin production in Bangladesh (Sarker and Islam, 2011).

In Bangladesh, at present, the approximate number of goats is 26.10 million (DLS, 2018). More than 90% of the total goat population comprises of Black Bengal Goat, which is reputed for their prolificacy, fertility, early sexual maturity, adaptability to hot humid conditions and superior quality meat and skin (Hussain, 1993; Amin et al., 2001) and the remaining ones include the Jamunapari and their crosses. Most of the farmers (80.5%) reared goats in the semi-intensive system but few farmers (7.3%) used confinement systems of rearing while 12.2% farmers used the free-range system (Islam et al., 2009). In Central Veterinary Hospital, Dhaka, most of the goats come are Jamunapari which are reared by the people of old Dhaka in their rooftop on a small scale.

However, various infectious and noninfectious diseases are frequently occurring in goats which considered as a great threat to these animals' survival in Bangladesh. Because of poor management practices and geo-climatic condition, the occurrences of various diseases become conducive in Bangladesh. Productivity and the economy of goat farming are greatly influenced by the occurrence of diseases. The study was conducted to determine the occurrence and distribution patterns of diseases of goat in Dhaka, Bangladesh.

MATERIALS and METHODS

Study Area and Period

This study was performed at Central Veterinary Hospital (CVH), Dhaka, Bangladesh during the one-year study period from January 2018 to December 2018. The necessary information and data were collected from registered record book of the veterinary hospital where all diseased goats were brought for treatment.

Sample Size

During this study period, a total of 452 goats were recorded to visit this hospital. Among those the number of animals in winter (November-February), summer (March-June) and rainy (July-October) season were 102,131 and 219 respectively. The prevalence was measured according to season and age of the goats which were studied.

Clinical Examination and Diagnosis

After visual examination of the patient different parts and system of the body of each of the sick animals were examined by palpation, percussion, auscultation, needle puncture and gait and posture of the animals. The general clinical examination was conducted according to the merit of the individual case, on the basis of disease history and owner's complaint, symptoms and techniques such as microscopic examination and laboratory common techniques that are used (Rosenberger, 1979). Therefore, the temperature, pulse, and respiratory rate from each of these sick animals were recorded. For viral disease diagnosis, close inspection were performed properly in order to observe the presenting signs such as a sharp rise of temperature of 104°F–106°F, occulonasal discharge, diarrhea and respiratory distress. Per rectal temperature was recorded with the thermometer in every case. Respiratory distress was identified with the help of stethoscope and the lung and tracheal sound were observed and recorded. For parasitic diseases, presumptive diagnoses of some parasitic diseases were done based on the history, clinical sign and symptoms and faeces examination (Blood and Radostits, 1989). Gross examination of faeces was made for the detection of living or dead worms or for the detection of the segments of tapeworms. The animal body was examined for the presence of any visible ectoparasites. Ectoparasites were identified according to the keys and descriptions given by Wall & Shearer (1997).

Determination of prevalence

Prevalence is a statistical concept referring to the number of cases of a disease that are present in a particular population at a given time which is determined by following equation,

$$\text{Prevalence} = \frac{\text{Number of existing cases on a specific time}}{\text{Number of total animal on a specific time}} \times 100$$

Statistical Analysis

All the collected data were transferred into Microsoft Excel sheet for descriptive statistics. Chi-square tests were used to determine the differences of prevalence in years, age of the animals and seasons of the year. P values of < 0.05 were considered significant by using SPSS 25.0 for windows (SPSS, Inc., Chicago, IL, USA).

RESULTS

Overall prevalence of different diseases of goat

In this study, 381 (84.29%) goats were found to be diseased from 452 visited goats at Central veterinary Hospital Dhaka. The highest prevalence of disease was shown by worm infestation (31.42%) and the lowest was by protozoal diseases (0.44%).

Prevalence of other diseases like PPR, pneumonia, dermatitis, enteritis, urolithiasis and miscellaneous (ruminal acidosis, disuria, repeat breeding) were 13.72%, 10.18%, 4.20%, 3.76 % 3.09% and 12.16% respectively. Lower prevalence was observed in case of Tetanus (1.11%), Mastitis (1.58%) and Bloat (2.65%) (Table 1).

Table 1. Overall prevalence of different diseases of goat in Dhaka

	Diseases	No. of positive case [b]	Prevalence (95% CI)
Viral	PPR	62	13.72 (10.54-17.09)
Bacterial	Pneumonia	46	10.18 (7.39-13.06)
	Tetanus	5	01.11 (0.14-2.07)
	Mastitis	7	01.55 (0.41-3.08)
Parasitic	Worm infestation	142	31.42 (27.14-36.09)
	Protozoal diseases	2	00.44 (-0.17-1.05)
Non-specific	Enteritis	17	03.76 (2.01-5.51)
	Dermatitis	19	04.20 (2.35-6.05)
	Bloat	12	02.65 (1.17-4.13)
	Urolithiasis	14	03.09 (1.50-4.70)
	Miscellaneous [a]	55	12.16 (9.15-15.20)
	Overall	**381**	**84.29 (81.03-88.04)**

[a]: Ruminal acidosis, disuria, repeat breeding; [b]:No. of examined animal =452;

Table 2. Season wise prevalence of goat diseases at Dhaka

	Diseases	Summer (NAE=131)		Rainy (NAE=216)		Winter (NAE=105)		X^2	P
		NPC	Prevalence (%)	NPC	Prevalence (%)	NPC	Prevalence (%)		
Viral	PPR	11	8.40	30	13.88	21	20.00	6.47	0.039*
Bacterial	Pneumonia	13	9.92	16	7.40	17	16.19	5.98	0.050
	Tetanus	-	-	2	0.93	3	2.85	4.47	0.107
	Mastitis	-	-	7	3.24	-	-	7.77	0.021*
Parasitic	Worm infestation	38	29.00	85	39.35	19	18.10	15.31	0.000**
	Protozoal diseases	-	-	2	0.93	-	-	2.19	0.334
Non-specific	Enteritis	3	2.29	7	3.24	7	6.66	3.39	0.183
	Dermatitis	16	12.21	3	1.39	-	-	29.73	0.000**
	Bloat	3	2.29	5	2.31	4	3.80	0.71	0.70
	Urolithiasis	5	3.82	5	2.31	4	3.80	0.844	0.656
	Miscellaneous[a]	19	14.50	24	11.11	12	11.43	0.948	0.622
	Overall	108	82.44	186	86.11	87	82.85		

[a]: Ruminal acidosis, disuria, repeat breeding; NAE=No. of animal examined; NPC = No of positive case; *, Statistically significant (P<0.05), **, Statistically highly significant (P<0.01)

Table 3. Age- wise prevalence of goat diseases at Dhaka

	Diseases	0-12M (NAE=231)		13-24M (NAE=162)		>24M (NAE=59)		X^2	P
		NPC	Prevalence (%)	NPC	Prevalence (%)	NPC	Prevalence (%)		
Viral	PPR	43	18.61	14	8.64	5	8.47	9.58	0.008**
Bacterial	Pneumonia	29	12.55	13	8.02	4	6.78	2.99	0.224
	Tetanus	4	1.73	-	-	1	1.69	2.82	0.244
	Mastitis	1	0.43	1	0.62	5	8.47	21.37	0.000**
Parasitic	Worm infestation	50	21.64	73	45.06	19	32.20	24.25	0.000**
	Protozoal diseases	2	0.87	-	-	-	-	1.96	0.37
Non-specific	Enteritis	10	4.32	7	4.32	-	-	2.65	0.266
	Dermatitis	2	0.87	15	9.25	2	3.39	16.77	0.000**
	Bloat	5	2.16	3	1.85	4	6.78	4.50	0.105
	Urolithiasis	9	3.89	3	1.85	2	3.39	1.34	0.510
	Miscellaneous[a]	28	12.00	16	9.88	11	18.64	3.11	0.211
	Overall	183	79.22	145	89.50	53	89.83		

[a]: Ruminal acidosis, disuria, repeat breeding; NAE=No. of animal examined; NPC = No of positive case; *, Statistically significant (P<0.05), **, Statistically highly significant (P<0.01)

Season wise prevalence of goat diseases

Season wise prevalence of goat diseases were shown in Table 2 in which highest prevalence was in the rainy season (86.11%) and lowest was in the summer season (82.44%). According to table 2, prevalence of worm infestation was found to be significantly higher (X^2 = 15.31, p = 0.000) in rainy (39.35%) and summer (29.00%) seasons while in winter season prevalence of PPR (20.00%) was found to be significantly higher (X^2 = 6.47, p = 0.039). The lowest prevalence was found in case of tetanus and protozoal diseases (0.93%) in the rainy season whereas Enteritis (2.29%) was found lowest in summer and Tetanus (2.35%) was also found lowest in the winter season.

Age- wise prevalence of goat diseases

Age-wise prevalence of goat diseases at Dhaka was shown in Table 3. According to age, prevalence of diseases was found to be highest (89.83%) in above (>) 24 months aged group and lowest was in 6-12 months aged group. In all aged groups prevalence of worm infestation was found significantly higher (X^2=24.25, p=000). Prevalence of mastitis was found significantly lower (X^2=21.37, p=000) in 0-12 months (0.43%) and 13-24 months (0.62%) aged group whereas the prevalence of tetanus was found to be lowest in above (>) 24 months aged old.

DISCUSSION

The goat suffers with various diseases, which are caused by viruses, bacteria, parasites and other non-infectious agents (Taylor, 1984). Among the viral diseases of goat, the present study showed 13.72% prevalence of PPR in goat which is concurrent with other investigations (Poddar et al., 2018) who recorded 13.74% prevalence of PPR at Upazila Veterinary Hospital, Pirojpur, Bangladesh. But in North east India, the prevalence of PPR was detected as 45.2%. This variation may be due to different geographical location and management system (Balamurugan et al., 2014). Our study also showed that the prevalence of PPR was highest in winter (20.00%) and lowest in summer (8.40%) season. In 0-12 month's age group, the prevalence was found highest (18.61%) followed by 13-24 months (8.64%) and above 24 months (8.47%) age group. This study revealed that young goats found to be more susceptible to PPR than the adult. Other studies also showed similar results (Nath et al., 2014; Sarkar and Islam, 2011). The increased susceptibility to young animals might be due to malnutrition, poor immunity and poor management systems.

Among the bacterial diseases, respiratory infections, or pneumonia, are a common and serious disease in goats. In our study, among the

bacterial diseases, pneumonia was recorded to prevalent in 10.18% goats whereas it was observed 17.11% in Ethiopia (Mekibib et al., 2019). The highest prevalence of pneumonia was recorded during winter season (16.19%) followed by 9.92% in summer and 7.40% in rainy season. Increased prevalence in winter might be due to the presence of huge dust in the air. Among study animals, 0-12months (12.55%) age group were more affected by pneumonia than 13-24 months (8.02%) and above 24 months (6.74%) age group. Almost similar result was reported by Sardar et al. (2006) but they found the lowest prevalence of pneumonia in summer season (1.02%). Findings of other studies showed slightly lower prevalence (9.6% and 8.28%) of pneumonia in goats in Magura and Sylhet respectively (Karim et al., 2014; Lucky et al., 2016). This study recorded 1.11% prevalence of Tetanus during the study period. The prevalence was varied according to the season where it was 2.85% in winter and 0.93% in the rainy season but no cases were detected in summer season. Age related prevalence was recorded 1.73% in the 0-12 months age group and 1.69% in the above 24 months age group. Interestingly no cases were found in the 13-24 months age group. Previous studies showed slightly higher prevalence of Tetanus with 4.13% and 3.05% and they also recorded the highest prevalence of tetanus in the summer season (Lucky et al., 2016; Dey et al., 2018). The variation might be due to the geographical location and management system of goats.

Mastitis refers to an inflammation of the mammary glands due to a bacterial infection. Udder damage, often caused by mastitis, is one of the leading causes of culling in goat operations (Scharko, 2008). Findings of the present study showed 1.55% prevalence of Mastitis in goats. These findings support the report of other studies who reported 1.6% mastitis in goat (Karim et al., 2014). But in Eastern Algeria the prevalence of mastitis in goat was 3.55% which was higher than the present study (Gabli et al., 2019). It was found only in the rainy season (3.24%) during our study period. The prevalence of mastitis was found to be increased with age as the study recorded 8.47% cases in the (above 24 months) age group and 0.62% in (13-24 months) and 0.43% in (0-12 months) age group. In rainy season goats were more susceptible to various diseases (Table 2). It might be due to wet environment and poor management during the rainy season. This finding agreed with the findings

of other studies (Nath et al., 2014; Sarkar and Islam, 2011).

Parasites pose a significant threat to the health of small ruminants. Parasites can damage the gastrointestinal tract, and result in reduced reproductive performance, reduced growth rates; less productive animals in terms of meat, fiber and milk; and even death (Kate et al., 2006). The present study showed that the prevalence of worm infestation was recorded to be highest with 31.42% which was seasonally distributed like summer (29.00%), rainy (39.35%) and winter (18.10%). Relatively higher age group (13-24) months (45.06%) were found to be more susceptible to worm infestation than 0-12 months (21.64%) and above 24 months (32.20%) age group. The present study showed 0.44% prevalence in case of protozoal diseases and interestingly it was only recorded in rainy season (0.93%) and 0-12 months (0.87%) age group. But previous study recorded 2.01% protozoal diseases in goat at Dinajpur Sadar (Mahfuza Akhtar, 2017). Results are incongruous might be due to geographical location and management practices.

Unawareness about the importance of deworming might be the underlying cause to high worm infestation. Bloat is mainly a dietary in origin and occurs most frequently in ruminants in Bangladesh (Sutradhar et al., 2000). The present study recorded 2.65% prevalence of Bloat which supports the findings of earlier studies (Rahman et al., 2012; Karim et al., 2014). The highest prevalence was observed in winter season (3.80%) followed by rainy (2.31%) and summer (2.29%) season. The prevalence of bloat was 6.78% in the adult (above 24 months) age group followed by 2.16% in (0-12 months) and 1.85% in (13-24 months) age group. Enteritis was found to be prevalent in 3.76% goats. Prevalence was highest in the winter season (6.66%) followed by rainy (3.24%) and summer season (2.29%). Dermatitis was recorded in 4.20% goats. Dermatitis was significantly (X^2=29.73, p=0.000) 12.21% and 1.39% prevalent in summer and rainy season respectively. But no case of dermatitis was found in the winter season. 13-24 months age group had significantly (X^2=16.77, p=0.000) higher prevalence of dermatitis (9.25%) than 0-12 months (0.87%) and above 24 months (3.39%) age group. The overall prevalence of urolithiasis in goats was 3.09%. Seasonal variation was observed in the prevalence of urolithiasis of goat where it was estimated 3.82% in summer season followed by rainy (3.80%) and winter season (2.31%). Earlier

stage of age group (0-12 months) was found to be more (3.89%) susceptible than 13-24 months (1.85%) and above 24 months (3.39%) age group. Alternatively, other study reported higher prevalence of urolithiasis in goat (44.4%) in Magura, Bangladesh (Karim et al., 2014). In this study, along with these non-specific diseases some disorders like ruminal acidosis, disuria, repeat breeding are termed miscellaneous was also observed which affects the goats.

CONCLUSION

From this study, it was observed that goats were most susceptible to worm infestation. Among the diseases found in this area, rainy season showed the highest prevalence of the diseases. Diseases prevalence also varies with the age of the animals. These findings will help to know about age-wise and season wise variation of different diseases of goat in this area and will help to execute proper preventive measures against those diseases.

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