

## PREVALENCE OF PESTE DES PETITS RUMINANTS IN GOATS IN THE CHUADANGA DISTRICT OF BANGLADESH

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### Abstract

Peste des petits ruminant (PPR) is goat's most fatal infectious disease. The study aimed to describe the prevalence of PPR in goats in the Chuadanga district of Bangladesh. This study was conducted in this area using clinical history and clinical examination of the animals. A total of 250 goats were randomly selected for this study, irrespective of age, sex, breed, and immune status. There were common findings such as high fever, nasolacrimal discharge, mucosal ulceration and erosion in the oral cavity, rapid breathing, and diarrhea during the clinical examination of the PPR-affected goats. The overall prevalence of PPR was 44%. The higher prevalence was observed significantly ( $P=0.006$ ) in 7-12 months age group (52.85%) compared to 0-6 months age group (40.48%) and >12 months age group (25.58%). Male (35.96%) goats were less prone to PPR than females (50.74%), and Black Bengal goats had a higher affinity (45.60%) than Jamnapari (39.71%). Non-vaccinated goats were highly prevalent (47.89%) to PPR than vaccinated (31.67%). The highest prevalence was found in March (48.72%) and most of the cases (41.81%) were treated with Oxytetracycline, antihistamine, and fluid therapy. These findings may exert awareness of farmers regarding PPR for goat rearing.

**Keywords:** PPR, Goat, Prevalence, Animal, Chuadanga.

### Introduction

Goat, known as the poor man's cow, is one of the significant components of livestock in Bangladesh. The contribution of goat to Bangladesh's rural economy is much higher than any other livestock sector. Farmers rear goats as a conducive occupation in Bangladesh. Bangladesh has a considerable population of goats (26.27 million out of 55.53 million livestock) (DLS, 2019). There are many diseases of goat prevailed in Bangladesh. Peste des petits ruminants (PPR) or goat plague is one of them. It is the most significant disease in goats in Bangladesh (Mohanto *et al.*, 2018). PPR is a viral disease of small ruminants, particularly in goats transmitted most frequently from one affected goat to another (Rahman *et al.*, 2016). The natural hosts for the PPR virus are sheep and goats, where goats are recognized as more susceptible than sheep (Islam *et al.*, 2012).

Lymphoid tissues and epithelial tissues of the gastrointestinal (GI) and respiratory tract are the primary sites of the multiplication of the PPR virus, where the virus produces characteristic lesions (Khan, 2010). The main clinical findings of PPR in goats are fever, nasal discharge, oral erosions, cough, and diarrhea (Bundza *et al.*, 1988). So, this disease threatens the production and development of goat population in many countries where it plays as endemic and farmers and livestock owners face significant economic loss (Zahur *et al.*, 2009).

PPR virus was first identified in 1942 in Cote d'Ivoire (Ivory Coast) and isolated in 1962 from Senegal (Balamurugan *et al.*, 2014). Among South Asian countries, the PPR virus was first described in India from Arasur village in the Villapuram district of Tamil Nadu in 1987, and it continued to be present in the southern state and Tamil Nadu (Chauhan *et al.*, 2009). In Bangladesh, FAO expert group first detected the existence of rinderpest-like disease in goats in western districts of the country in 1993, and later, the World Reference Laboratory identified the PPR virus as the causal agent of the disease (Banik *et al.*, 2008). PPR has been present in Bangladesh's goats since 1993 (Bari *et al.*, 2018). PPR occurs in most African countries, the Middle East, and the Indian subcontinent. Outbreaks of PPR are now noticed frequently in India, Bangladesh, Pakistan, and Afghanistan (Samad, 2008).

The outbreak of PPR was noticed in Bangladesh during 1993-95 despite the vaccination of goats using live Rinderpest vaccine as it resembles with Rinderpest virus. The vaccine used in the field failed to protect the goat against the existing local PPR virus strain (Islam *et al.*, 2001). Transmission of the disease occurs through close contact with the droppings of infected animals to healthy animals. The morbidity and mortality rate in an affected goat population can reach 100% and 23-100%, respectively (Chowdhury *et al.*, 2014). PPR virus plays a significant threat due to the high morbidity and mortality in areas where the local economy mostly depends on ruminant production. There is no effective treatment for PPR in goats as it is a viral disease. Applying supportive treatment, mortality may be significantly controlled (Fentahun and Woldie, 2012). Chuadanga district of Bangladesh is a densely goat-populated area, and goat rearing is a profitable household enterprise for farmer's smooth livelihood. Farmers and researchers should know the present status of the disease occurrence in this area to take measures for taking prevention and control measures and save the goat population in this area. Therefore, the objective of this study was to know the prevalence of PPR in Chuadanga district of Bangladesh in terms of age, sex and breed; and supportive treatment in PPR infected goats.

## Materials and Methods

### Study area

The study was conducted in the Alamdanga upazila of the Chuadanga district of Bangladesh.

### Study duration and Sample Size

The study duration was three months, from February 2019 through April 2019. A total of 250 goats were recorded for this study. The goats were selected randomly and categorized by age, sex, and breed from the different union of Alamdanga upazila of Chuadanga district.

### Diagnosis of PPR

It was performed according to the goats' history, clinical findings, and physical examinations.

### Data analysis

All the data obtained from the study area were entered into Microsoft Excel 2016 according to the selective parameters, then cleaned, coded, and recoded where necessary. Statistical analysis was performed using STATA-14 (Stata Corp, 4905 Lakeway Drive, College Station, Texas 77845, USA). The results were expressed in number, prevalence, and P value (Significance level was  $p \leq 0.05$ ).

## Results

Randomly selected 250 goats were enrolled for the study from different unions of this study area of Chuadanga district from February 2019 to April 2019. Among 250 goats, 110 cases were found PPR positive. As a whole, 44% of the study population was PPR prevalent (Table 1).

**Table 1.** Overall Prevalence of PPR.

Total no. of case	No. of PPR affected case	Overall prevalence
250	110	44.00%

The Goats were classified based on age into three groups 0-6 months, 7-12 months, and >12 months. Among the groups, a maximum (52.85%) of PPR prevalence was observed in 7-12 months of age in comparison to 0-6 months (40.48%) and (>12) months (25.58%) (Table 2). Moreover, female goats (50.74%) were more affinity to PPR than males (35.96%) (Table 3).

**Table 2.** Prevalence of PPR in goats according to age group.

Age group in month	No. of cases	PPR affected cases	Prevalence	<i>p</i> -value
0-6	84	34	40.48%	0.006
7-12	123	65	52.85%	
>12	43	11	25.58%	

**Table 3.** Prevalence of PPR in goats according to sex.

Sex	No. of cases	PPR affected cases	Prevalence	<i>p</i> -value
Female	136	69	50.74%	0.019
Male	114	41	35.96%	

The breed was characterized as Black Bengal and Jamnapari based on their phenotypic characteristics, where the maximum occurrence of the disease was noticed in Black Bengal goats (45.60%) compared to Jamnapari (39.71%) (Table 4). Concerning immune status, this result indicated that non-vaccinated goats (47.89%) were affected with PPR in higher numbers than that of the vaccinated group (31.67%) (Table 5). According to monthly observation, the disease was more common in March (48.72%) than in the others month, where the prevalence in February and April were (46.36%) and (33.87%) respectively (Table 6).

**Table 4.** Prevalence of PPR in goats according to breed.

Breed	No. of cases	PPR affected cases	Prevalence	<i>p</i> -value
Black Bengal	182	83	45.60%	0.403
Jamnapari	68	27	39.71%	

**Table 5.** Prevalence of PPR to immune status.

Immune status	No. of cases	PPR affected cases	Prevalence	<i>p</i> -value
Non vaccinated	190	91	47.89%	0.027
Vaccinated	60	19	31.67%	

**Table 6.** Prevalence of PPR in goats according to month.

Month	No. of cases	PPR affected cases	Prevalence	<i>p</i> -value
February	110	51	46.36%	0.171
March	78	38	48.72%	
April	62	21	33.87%	

There is no specific treatment for viral diseases. A line of treatment follows to prevent animals from secondary bacterial infections. Among 110 PPR cases, most of the cases (41.81%) used Oxytetracycline drugs in comparison to Sulphadimidine (23.64%) and Ciprofloxacin (34.55%) along with antihistaminic and fluid therapy (Table 7).

**Table 7.** Name of used drugs with the percentage.

Used drugs	No. of goat treated	Frequency %
Oxytetracycline	46	41.81%
Sulphadimidine	26	23.64%
Ciprofloxacin	38	34.55%

## Discussion

This study showed that the goats of 7-12 months of age were significantly ( $P=0.006$ ) more (52.85%) affinity to the PPR virus, which was consistent with Islam et al. (2012), Parvez et al. (2014), Rahman et al. (2016), Rahman et al. (2017) and Mohanto et al., (2018) who reported that maximum prevalence occurs in goat having 7-12 months of age (Table 2). In the context of sex, the PPR virus infected female goats (50.74%) more than males. This result was coherent with Rahman et al. (2011), Rahman et al. (2016), Rahman et al. (2017), and Mohanto et al. (2018). But Parvez et al. (2014) showed that the highest occurrence of the disease was in males, which was incoherent with this result.

The infection of the PPR virus in Black Bengal goats (45.60) was statistically insignificant ( $P=0.403$ ), which was in line with the results of Rahman et al. (2011), Islam et al. (2012), Parvez et al. (2014), Rahman et al. (2016), Rahman et al. (2017) and Mohanto et al. (2018). Concerning immune status, the PPR scenario was significant ( $P=0.027$ ) in the study area. Islam et al. (2012), Rahman et al. (2016), and Rahman et al. (2017) showed the highest PPR disease in the non-vaccinated group, which was similar with this study (47.89%). Besides these, monthly basis PPR virus infection was non-significant ( $P=0.171$ ). Parvez et al. (2014) expressed that the higher prevalence of PPR occurred in August, which was inconsistent with this study. This variation may be due to different geographic locations.

## Conclusion

This study observed that young goats having 7-12 months of age were more prone to PPR than adults. Black Bengal goats were more susceptible to PPR than Jamnapari goats. The prevalence of PPR in females was higher than in males and non-vaccinated showed higher prevalence than vaccinated. Isolation and identification of PPR strain should be conducted for further study.

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