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## **Incidence of Peste des Petits Ruminants in Rangpur sadar of Bangladesh**

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**Abstract:** This epidemiological study was conducted to find out the incidence of Peste des Petits Ruminants (PPR) in goat and sheep at Upazilla Veterinary Hospital, Rangpur sadar, Rangpur during the period of January to April, 2014. In this period, 236 clinically infected goat and sheep were examined in which 22 (9.32%) PPR cases were diagnosed on the basis of history, clinical signs and gross pathological lesions. High fever (104-107 °C), mucopurulent oculo-nasal discharge, rapid and labored breathing, mouth lesion and diarrhea were the common clinical sign of PPR infected goat and sheep. The postmortem examination findings were dark red areas and congestion in different lobes of lungs, enlargement of spleen and lymph nodes, erosion of abomasums and characteristics zebra striping in the mucosa of colon. This present study reveals that about 7-12 months aged group of goats were more prone (40.91%) to PPR compare to adult (above 1 year) and Black Bengal goat was more susceptible (72.32%) than Jamunapari (27.78%) goat where the occurrence of PPR disease was more in goat (81.82%) than sheep (18.18%).

**Keywords:** Peste des Petits Ruminants; incidence; high fever; zebra striping; diarrhoea

### **1. Introduction**

Bangladesh is an agrarian society with the agricultural sector playing an important role at the national and household level economy contributing 1.60% to the GDP and providing employment to a large proportion of the population that relies on livestock for livelihood. There are about 25.93 millions goat populations out of 54.74 millions of Ruminants livestock in Bangladesh (Livestock Economy 2016-17, DLS, Bangladesh). Small ruminant (sheep and goat) production can be a very important source of quality protein supplied through meat and milk. In 2016, Bangladesh produced 250,000 tones of sheep and goat meat and is among the top ten<sup>1</sup> goat producing countries of the world (Ranked 4<sup>th</sup>). Goat farming is a common feature for the vast majority of Bangladesh rural households where on average four to five small stock is reared. The predominant breed is the Black Bengal, which is highly prolific with an average kidding rate 280 kids per 100 adult female goats. The next common breed is the Jamunapari and less commonly the Beetles and Barberi. Sheep is less commonly reared compared to goats but it is popularly used during the Eid festival for religious sacrifice and also for making local blankets from its wool. Black Bengal goats are found throughout of Bangladesh although they occupied in large number in some specific region of Bangladesh. For poverty alleviation goats are playing a vital role. Hence, goat is called “cow of poor people” in Bangladesh. However, different types of infectious diseases (PPR, Pneumonia, Goat pox, Enterotoxemia, Mastitis, Tuberculosis, Tetanus, Papillomatosis,

Ringworm etc.) and non-infectious diseases (Ketosis, Pregnancy toxemia, Vaginal prolapse etc.) are important diseases act as hindrance in raising the goat population in this country, specially peste des petits ruminants (PPR) causes higher morbidity and mortality and huge economic losses. The virus that causes PPR belongs to morbilli virus group of the paramyxoviridae family. Peste des petits ruminants (PPR) virus is a negative, single stranded, non-segmented, enveloped, RNA, pleomorphic virus particle. The virus is efficiently spread by aerosol and probably only small amount of virus is required to infect susceptible individual. The virus replicates in the upper respiratory tract and then spreads to local lymphnodes (Imagawa, 1964). Peste des Petits Ruminants (PPR) has been recognized to a highly contagious viral disease of small ruminants, particularly in goats in Bangladesh. Sheep and goats are the natural host of peste des petits ruminants (PPR) virus, whereas goats are more susceptible than sheep. PPR was first recorded as clinical entity in the Ivory coast of West Africa in 1942 (Samad, 1996). The presence of rinderpest like disease i.e. PPR was first noticed in Bangladesh by FAO expert team while visiting western part of Bangladesh in 1993. PPR was detected by sample taken from the sick goat mainly in border belts area of south western districts (sathkhira, Jessore and Borguna) of Bangladesh by Taylor *et al.* (2002) and then spread an epidemic fashion throughout the country (Debnath, 1995). Later, the causal agent of the disease was identified as PPR virus by World Reference Laboratory (Barrett *et al.*, 1997). The typical clinical signs of PPR virus infection are always associated with high fever (106-107 °F), discharge (ocular and nasal), stomatitis and excessive salivation. The oculo-nasal discharges become mucopurulent followed by pneumonia accompanied with coughing and abdominal breathing. A watery blood stained diarrhea is common in the later stage of infection, which is followed by death. During disease cycle, severe immunodeficiency occurs commonly and this is thought to contribute susceptibility to secondary bacterial infections that accounts for most of the mortality associated with Peste des Petits Ruminants (PPR) infection (Sil *et al.*, 1995). The maternal immunity derived from the vaccinated dose was sufficient to protect the kids for a period of 135-145 days during their early lives (Sil *et al.*, 1995). At present homologous PPR vaccine has been practicing in Bangladesh against PPR to make up strong immunity. To prevent this devastating disease, effective vaccination programme should be continued in all the year round and the government should take proper steps at the necessary moment. Considering the above circumstances, the present clinical report has been undertaken with addressing the objectives to know the occurrence of PPR in the study area and to estimate the proportionate occurrence of PPR in goat and sheep in relation to breed, age, sex and immune status in Rangpur Sadar, Rangpur.

## 2. Materials and Methods

The study was conducted in Upazilla Veterinary Hospital, Rangpur sadar, Rangpur. The epidemiological study period was six months from January to June, 2014. The study was carried on Peste des Petits Ruminants (PPR) infected sheep and goats of various age, sex and breed that were brought to the hospital over the study period. A total number of 236 clinically infected goat and sheep were recorded in which Peste des Petits Ruminants (PPR) infected case in goat was only 22 and 4 in infected sheep on the basis of farmer's history like vaccinated or non vaccinated and clinical sign. The total samples were divided into several groups such as species, age, sex, breed and vaccination. Diagnosis was made mainly by means of clinical history, physical examinations, clinical signs of the sheep and goats. Close inspection were performed properly in order to observe the presenting signs and symptoms such as high fever 104-107 °C, oculonasal discharge or mucopurulent discharge, mouth lesion (necrotic ulcer), depressed and sleepy appearance, arched back, lowering head, rough hair coat, foul smell from mouth, severe dehydrated condition, diarrhea, respiratory distress (rapid and laboured breathing) and weakness of animal. Temperature was recorded per rectum with the thermometer in each case. Respiratory distress was identified with the help of stethoscope and observed the lung and tracheal sound and recorded. In diarrhoeal case, dehydration was measured by skin fold test. Skin fold test was performed to rough estimation of the degree of dehydration. The clinical signs of the disease as well as the history of morbidity and mortality were mainly recorded in goats. The postmortem examination findings were dark red areas and congestion in different lobes of lungs with pneumonic changes, enlargement of spleen and lymph node, erosion of abomasums and characteristics zebra striping in the mucosa of colon. A descriptive analysis was carried out and the results were expressed in percentage (%).

## 3. Results and Discussion

A total number of 236 diseased goat and sheep were examined in which 22 cases were PPR, 85 cases were parasitic infestation, 24 cases were diarrhoea (non-specific), 23 cases were pneumonia and 82 cases were other diseases. The highest occurred disease was parasitic infestation which was 36.02%. This high occurrence of parasitic infestation might be due to irregular deworming and poor health care and management. The occurrence

of PPR disease was found only 9.32% that shown in Table 1. The goats were more susceptible than sheep. The total number of PPR affected goats was 18 which was 81.82% and sheep were only 4 in number which was 18.18% shown in Table 2. The higher occurrence of PPR disease in goat is probably related to large number of goat reared in the study area than sheep and this is also supported by Braide (1981) who observed that it mainly affects goats but involvement of sheep is not exceptional. The occurrence of PPR disease was higher in Black Bengal goat (72.22%) than in Jamunapari goat (27.78%) that shown in Table 3. Samad (2001) observed that Black Bengal breed (67.24%) is more susceptible to PPR than Jamunapari breed (32.76%). This study is much similar with my study. The females (59.09%) were more susceptible than male (40.91%) to PPR disease shown in Table 4. These results were not agreement with the results of Samad (2001) where found that both male and female goats are equally susceptible to PPR. The occurrence of PPR was maximum (40.91%) in 7-12 months of age group of both sheep and goat followed by 4.54 %, 36.36 % and 18.18 % in 1-3 months, 4-6 months and above 12 months of age group respectively. The prevalence of PPR was higher in young goats (68.19%) as compared with adult goats (31.82%) that shown Table 5. These results were almost corresponds with the report of Blood *et al.* (1995), who observed that the disease was rapidly fatal in the young animals (60.80%) especially in 7-12 months age group. The occurrence of PPR was higher in non-vaccinated (90.90%) sheep and goat as compared with vaccinated (9.1%) cases that presented in Table 6. This result supported by the earlier report made by Gibbs *et al.* (1979) who found higher prevalence (68.38%) of PPR in the non-vaccinated goat population.

**Table 1. Occurrence of PPR in relation to other diseases in goat and sheep.**

Total no. of cases	Name of diseases	No. of cases	%
236	PPR	22	9.32
	Parasitic infestation	85	36.02
	Diarrhoea (non-specific)	24	10.17
	Pneumonia	23	9.75
	Other diseases	82	34.75

**Table 2. Occurrence of PPR in different species.**

Species	No. of cases	No. of PPR cases	%
Goat	230	18	81.82
Sheep	6	4	18.18
Total	236	22	9.32

**Table 3. Occurrence of PPR in goat according to breed.**

Breed	No. of samples	No. of affected samples	%
Black Bengal	204	13	72.22
Jamunapari	26	5	27.78
Total	230	18	7.83

**Table 4. Occurrence of PPR disease on the basis of sex.**

Sex	No. of samples	No. of PPR cases	%
Buck	83	9	40.91
Doe	153	13	59.09

**Table 5. Susceptibility of PPR disease according to age.**

Age group (months)	No. of cases	%
1-3 months	1	4.54
4-6 months	8	36.36
7-12 months	9	40.91
Above 1 year	4	18.18

**Table 6. Occurrence of PPR in relation to immune status of sheep and goat.**

Immune status	No. of PPR cases	%
Vaccinated	2	9.1
Non vaccinated	20	90.90

#### 4. Conclusions

Peste des Petits Ruminants (PPR) is an acute febrile and highly contagious viral disease of small ruminants characterized by high fever, mucopurulent nasal and ocular discharge, necrotizing and erosive stomatitis, pneumonia, necrosis and ulceration of mucous membrane and inflammation of gastrointestinal tract, leading to severe diarrhea. The present study has been made to know the present situation of PPR disease in Upazilla Veterinary Hospital, Rangpur sadar, Rangpur district. This preliminary study suggests that goats are more infected with PPR than sheep. Black Bengal goats are more susceptible to PPR than Jamunapari goat. Female sheep and goats were more affected by PPR than male sheep and goats. About 7-12 months were more prone to PPR than other age group. Vaccination should be done carefully as it markedly reduces the chance of infection. The chances of other bacterial infections especially pneumonia and gastroenteritis increases with the increase of duration of disease, it may be due to immunosuppressive nature of the PPR disease and hence, it causes heavy economic losses in the country every year and also markedly decrease the production of the infected animal. As the vaccination of sheep and goat reduces the chance of infection, regular vaccination is recommended. High production efficiency is very important for achieving the maximum economic return but limited work has been done about PPR in Bangladesh. However, no precise reports on PPR are available for this area, further study for the occurrence of PPR disease needed to be carried out.

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#### Conflict of interest

None to declare.

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