

Variability in prevalence and therapeutic effectiveness in PPR affected goats of Thakurgoan, Bangladesh

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ABSTRACT

Peste des petits ruminants (PPR) is an acute, febrile, highly contagious and infectious disease of goats along with high morbidity and mortality. The present study was conducted to determine the prevalence and variability in clinical presentation and response to treatment in terms of breed, age, sex and vaccination status in PPR affected Black Bengal and Jamuna Pari goats at the Upazila Veterinary Hospital, Thakurgoan during February and March 2014. A total of 132 goats were examined in the hospital during the course of the study period, of which 52 of different breeds (Black Bengal and Jamuna Pari) were affected with PPR. Detail history, physical examination and clinical examination were assessed for the diagnosis of disease. The results revealed that Black Bengal breed was more susceptible (45%) to PPR than Jamuna Pari (30%) but it was not statistically significant. Young animals usually 4 to 12 months of age were more prone (52%) to PPR than adult animals (31%) and kids (22%), ($P=0.02$). Female goats were proportionately more susceptible (40%) to PPR than male goats (38%). Non-vaccinated goats were more susceptible (48%) to PPR than vaccinated goats (21%), ($P=0.005$). Response to treatment with parenteral (I/M) use of Oxytetracycline was comparatively higher (57%) than that achieved with the parenteral use of sulphadimidine (42%). The study additionally pointed out the particular condition regarding PPR, which is currently becoming endemic throughout the Bangladesh which may be reduced substantially by proper vaccination and other management approaches.

Key words: Peste des petits ruminants (PPR), Goats, Prevalence, Thakurgoan.

INTRODUCTION

The disease Peste des Petits Ruminants (PPR) is literally named as “Plague of small ruminants” is an economically significant acute and highly contagious viral disease of sheep and goats. The traditional name ‘kata’ was given in African countries to stomatitis and pneumoenteritis of the Nigerian dwarf goat. But official instances like the Food and Agricultural Organization (FAO) and Office International des Epizooties (OIE) use the French name PPR (Banik et al., 2008). “Peste des Petits Ruminants” was the French name of a similar disease of sheep and goats first described in Côte d'Ivoire (Ivory Coast) in 1942 (Rowland et al.,

1971). International organization for animal health has identified PPR as a notifiable and economically important transboundary viral disease of sheep and goats associated with high morbidity and mortality (Balamurugan et al., 2012). For many years, PPR was considered as an African disease localized mainly in western and central Africa (Losos, 1989). However, in recent decades, the disease has become endemic across Sub-Saharan Africa, Southern Asia, including India, Pakistan and Nepal, near East and the Arabian Peninsula, including the Islamic Republic of Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Saudi Arabia, the United Arab Emirates and Yemen (Taylor and Barrett, 2007). It was found that the isolates from Bangladesh were closely related to other strains from India and clustered within the Asian group of PPR viruses (Barrett et al., 1997). The virus is closely related to rinderpest virus, another member of Morbillivirus, which causes similar disease in large ruminants. It is also closely related to measles and canine distemper virus. Most goats (90%) reared in

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Bangladesh are of Black Bengal breed, reputed for their prolificacy, fertility, early sexual maturity, adaptability to hot humid conditions and superior quality of meat and skin (Amin et al., 2001). The disease is clinically characterized by high fever,

MATERIALS AND METHODS

Study area

The study was carried out to determine prevalence of PPR in different breeds of goats and their response to antibiotic treatments registered at the Upazila

Table 1: Prevalence of PPR in relation to breed, age, sex and immune status of goat

Variables	Category	N	PPR Positive	PPR Negative	Prevalence (%)	χ^2 -value	p-value
Breed	Black Bengal	85	38	47	45	2.8	0.096
	Jamuna Pari	47	14	33	30		
	Total	132	52	80	39		
Age group	Adult (>12)	54	17	37	31	7.42	0.02
	Young (4 to 12)	60	31	29	52		
	Kid (< 4)	18	04	14	22		
Sex	Male	47	18	29	38	0.04	0.85
	Female	85	34	51	40		
Immune status	Vaccinated	34	07	27	21	7.76	0.005
	Non- vaccinated	98	47	51	48		

N= Number of animals

Table 2: Response of PPR- affected goats to treatments with different drugs

Group	Response to treatment		Total case	% of response to treatment	p-value
	Positive	Negative			
Group-1	17	13	30	57	0.29
Group-2	10	14	24	42	

necrotic stomatitis, catarrhal inflammation of the ocular and nasal mucosa, pneumonia, diarrhoea and death (Naznin et al., 2014). Although it is a fatal disease despite there is no specific treatment following infection and control is possible only with vaccination. Therefore, the present study was conducted to determine the prevalence of PPR disease and the response of animals to the antibiotic treatment at the Upazila Veterinary Hospital, Thakurgoan, Bangladesh.

Veterinary Hospital, Thakurgoan during February to March 2014.

Study Population

About 132 goats were examined in the hospital during the study period. Among them, total 52 goats of Black Bengal and Jamuna Pari breeds were affected with PPR. Diagnosis was made by means of anamnesis and clinical signs. The total samples were divided into different categories such as breed, age, sex and immune status.

Treatments

To observe the treatment efficacy the goats were divided into two groups based on most commonly prescribed antimicrobials.

Group I: Renamycin-100[®] (Oxytetracycline @ 10mg/kg bw) + Hista Vet[®] (Pheneramine melete @ 1mg/kg bw) + Renalyte[®] (ORS) and **Group II:** Diadin[®] (Sulphadimidine-Na @ 165 mg/kg bw) + Hista Vet[®] (Pheneramine melete @ 1mg/kg bw) + Renalyte[®] (ORS) was given in separate groups A response to treatment as the outcomes- recovery from the disease or death was the success or failure of a treatment applied over the two groups mentioned.

Statistical analysis

The data obtained were stored and coded accordingly using Microsoft Excel-2007. The data were exported from MS Excel-2007 to STATA/IC-11.0 (Stata Corporation College Station) for analysis. The results were expressed in percentage with p-value of Chi-Square Test. Significance was determined when $p < 0.05$. Difference in the occurrence of PPR in different location was shown by using a χ^2 test.

RESULTS

A total 132 goats of two different breeds were admitted during the study period, of which prevalence in Black Bengal was 45% and in Jamuna pari it was 30%. But their difference was not significant ($p > 0.05$). The prevalence of PPR in different age groups studied shown that among the 54 adults (more than 12 months of age), 60 young (4 to 12 months of age) and 18 kids (Less than 4 months of age) the prevalence was 31%, 52% and 22%, respectively and was statistically significant ($P < 0.05$). Although sex-wise prevalence did not differ significantly ($P > 0.05$) and the prevalence in female goats were 40% and 38% in male goats.

Prevalence of PPR in vaccinated and non-vaccinated goats were 21% and 48%, respectively, and the rate was varied significantly ($p < 0.05$) cited in table 1. The relative effects of drugs in the treatment of PPR are presented in table 2. The percentage response of treatment towards parenteral (I/M) Oxytetracycline was higher (57%) than parenteral (I/V) use of Sulphadimidine (42%) but statistically insignificant ($P > 0.05$).

DISCUSSION

Prevalence of PPR in oats

The overall prevalence of PPR was 39% in the examined goats that positive for PPR. Similar prevalence of PPR (51%) was reported by Rahman et al. (2011) in Mymensingh district of Bangladesh. Conversely, the finding of this study was lower than the prevalence of 90% reported in Al-Ahsa oasis in eastern Saudi Arabia in 1988. The breed wise prevalence of PPR was published 52% in Black Bengal, 49% in Jamuna Pari and 43% in Cross breed goats by Naznin et al. (2014). It is difficult to draw any conclusions for changes of prevalence because of the differences in sampling procedures in the different studies that affect their representativeness.

Age-wise prevalence

PPR is rapidly fatal in the young goats (60.87%) especially at 7-12 months of age (Blood et al., 1995). Apparently the disease differs significantly ($P < 0.05$) between age groups and this study shows that the young goats which were 4 to 12 months of age were more susceptible to PPR and the prevalence in them was 52%, which was somewhat lower than the previous study where 60.87% prevalence was found between 6 to 12 months of age (Gupta et al., 2007). Singh et al. (2004) also assessed that the disease is more prevalent in the goats less than one year of age. The increased susceptibility of young goats to PPRV might be due to malnutrition, poor immunity and poor

management systems (Sarker and Islam, 2011).

Sex-wise prevalence

The occurrence of disease in female was little bit higher than male goats which is supported by the study of Abdalla et al. (2012), that they estimated the disease prevalence was 54.2% in male and 64.2% in female goats. Moreover the sex-wise prevalence was not significantly different and this finding also agrees with Osman (2005) findings that the sex of the animals had no effect on the development of PPRV antibodies.

Prevalence based on immunological status

Prevalence of PPR was varied significantly based on the immunological status of the animals. This result supported the early report of Islam et al. (2013) who noted the prevalence to be 66.40% in non-vaccinated goats compared with vaccinated 19.56% goats. However, vaccination against the disease leads to decrease in the prevalence, but may not absolute guarantee for freedom from the disease.

Response to treatment

It was reported that, mortality rates may be decreased by the use of drugs that control the bacterial complications; especially Oxytetracycline and Chlortetracycline are recommended to prevent secondary pulmonary infections. The result of the present study is similar to the findings of Naznin et al. (2014) who found the percentage of response to treatment towards parenteral (I/M) Oxytetracycline was higher (58%) than parenteral (I/V) use of Sulfonamide (28%). Similarly, Islam et al. (2013) reported that Oxytetracycline was more effective (64%) than Sulphadimidine (44%) along with symptomatic treatment. However, herbal medicines are also used for treatment such as ethno-veterinary herbal medicine and goat weeds (Abubakar and Irfan, 2014).

CONCLUSION

PPR is a highly contagious disease with higher mortality and morbidity in goat. In this study it is revealed that Black Bengal goats are susceptible irrespective of breed and sex, but differs significantly in relation to age and vaccination status of the animal. Although against virus, there is no specific treatment, antibiotic and supportive therapy might be helpful.

ACKNOWLEDGEMENT

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