SEROPREVALENCE OF PESTE DES PETITS RUMINANTS IN SMALL RUMINANTS UNDER DIFFERENT MANAGEMENTAL CONDITIONS

H. C. Chauhan, A. I. Dadawala, B. S. Chandel, I. H.Kalyani, Sandip S. Patel and H. N. Kher

Department of Microbiology

College of Veterinary Science and A.H.

SDAU, Sardarkrushinagar-385 506 (B.K.), Gujarat

Recevied 5-6-2011 Accepted 15-9-2011

ABSTRACT

The present study envisaged appraisal of seroepidemiology of PPR in sheep and goats maintained under different managemental conditions. Among 970 sera of sheep and goats, 503 showed positive antibody titre indicating 51.86 per cent seroprevalence, where in seroprevalence was found to be increased with increase in the age and highest seroprevalence was recorded in the panjarapoles, followed by migratory flocks and organized farms. Out of 591 sera tested from sheep, 335 (56.68 %) were found to be positive for antibodies against PPRV. Agewise maximum seroprevalence recorded was age groups of > 3 years followed by 63.41 per cent in age group of 2 to 3 years, 42.05 per cent in 1 to 2 years and 35.71 per cent in ≤ 1 year. Out of 379 serum samples examined from goats, 168 (44.33 %) showed the positive reaction to PPRV. Maximum seroprevalence of 55.65 per cent was found in the age group of > 3 years, followed by 2 to 3 years (52.00 %), 1 to 2 years (31.91 %) and 27.87 per cent in ≤ 1 year of age groups as reported in case of sheep.

KEYWORDS : Seroprevalence, PPRV , c-ELISA, Management , Gujarat

INTRODUCTION

Peste des petits ruminants (PPR), also known as goat plague, is a highly contagious viral disease affecting domestic and wild small ruminants, (Furley *et al.,* 1987). It is caused by Peste des Petits Ruminants Virus (PPRV) which belongs to the Morbillivirus genus of family *Paramyxoviridae*, characterized by erosive stomatitis, enteritis, pneumonia and death. Economically, it has been the most important disease in sub Saharan Africa, the Middle East and southeast Asia. Since, its first reported occurrence in 1987 (Shaila *et al.,* 1989) from Arasur village in the Villapurum district of Tamil Nadu, PPR has been reported from different parts of the country and is considered as an endemic disease causing a great loss to small ruminants of the country. Economic losses due to PPRV have been estimated to be 1800 million Indian rupees (US$ 39 million) annually (Venkatramanam *et al.,* 2005). Looking to the increasing incidence of PPRV in sheep and goats, the present work was under taken to know the seroprevalence of PPRV in sheep and goats of Gujarat maintained under different managemental conditions.

MATERIALS AND METHODS

A total of 970 sera were collected from sheep (591)and goats (379) from rural areas, organised farms and the Panjarapoles of different districts of Gujarat State. The separated serum was collected in screw capped plastic vial and heat inactivated at 56°C for 30 minutes. The sera were stored at –20°C till further use.

PPR c- ELISA

PPR c-ELISA kit developed at National Morbillivirus Referral Laboratory, Division of Virology, IVRI, Mukteswar was used for detection of PPRV antibodies (Singh *et al,*2004). c-ELISA was performed strictly as per the protocol outlined in the user's manual supplied with the kit. The test plates were

read at 492 nm in ELISA plate reader (Multiskan Plus, Lab System) and optical density (OD) values were determined.

RESULTS AND DISCUSSION

Among 970 sera of sheep (591) and goats (379), 503 showed positive antibody titre indicating 51.86 per cent seroprevalence with the range of 43.08 to 63.64 per cent among regions, 43.08 to 65.06 per cent among districts and 21.28 to 75.56 per cent among various locations and were significantly different ($P \leq 0.01$).

Kachchh region showed maximum seroprevalence rate of 63.64 per cent followed by North Gujarat (49.79 %) and Saurashtra (43.08 %). Difference observed among regions was highly significant ($P \leq 0.01$). Higher seroprevalence observed in Kachchh could justify the occurrence of most frequent outbreaks in this region and frequent exposure of animals to the virus.

Highly significant ($P \leq 0.01$) difference was also observed between sheep and goats. The overall rate of seroprevalence in sheep and goats was 51.86 per cent, which is in contrast to the reports of Patil *et al.* (2009) who reported lower rate of seroprevalence 33.00 per cent in sheep and goats in Karnataka. Khan *et al.* (2007) also detected 43.33 per cent seroprevalence among sheep and goat population of Pakistan. Similar to the present findings, higher seroprevalence rate (60.00 per cent) has been reported by Rashid *et al.* (2008) in Pakistan.

The higher seroprevalence rate in sheep and goats, observed during the study might be due to migration of small ruminant flocks from the bordering Rajasthan state, from where PPR outbreaks were reported (Pawaiya *et al.,* 2004). Small ruminants in North Gujarat and Kachchh regions are generally farmed on free-range pasture land. These animals often travel long distances during dry season in search of fodder and water. PPRV is transmitted through direct contact in between infected and susceptible animals and nomadic animals often come in contact with local sheep and goat population . In a serological study of PPR in Andhra Pradesh using serum neutralization test, similar observations were made by Krishna *et al.* (2001). The detection of high prevalence of antibodies against PPRV in sera collected from field samples of sheep and goats in this study indicated the exposure of these animals to the field virus as no vaccination with PPR vaccine was carried out previously. Prevalence of PPRV antibodies in 16 locations of six districts indicated the widespread of the disease in three regions of Gujarat state. These findings substantiated the reports of Osman *et al.* (2009) who recorded similar observation in sheep and goats in Sudan.

In sheep sera were tested from 13 different locations and the rate of seroprevalence in all these locations ranged from 32.00 to 83.72 per cent. In goats 10 different locations were included and the rate of seroprevalence ranged from 7.41 to 80.00 per cent in all the places. In both sheep and goats the highest incidence in Panjarapole, Idar and Panjarapole, Kant is quite obvious, as they maintain diseased and disabled animals altogether from various parts.

In both animals, sera were tested from four age groups *viz.,* $\leq$ 1 year, 1 to 2 years, 2 to 3 years and > 3 years. Agewise seroprevalence differed significantly ($P \leq 0.01$). In both sheep and goats the highest seroprevalence was recorded among the adult animals of > 3 years of age, followed by 2 to 3 years, 1 to 2 years and $\leq$ 1 year. Increasing age was associated with an increase in seropositive status of both the species of animals, which corroborates the findings of Patel (2006). This may be due to that the PPRV is highly immunogenic and naturally infected animals remained positive for long period of time due to frequent exposure to the virus. Similar observation had also been made by Szkuta *et al.* (2008) in Ethiopia.

In the present study, five breeds of sheep were included. The rate of seroprevalence was highest in Chokhla (64.44 %), followed by in Marwari (60.16 %), Patanwadi (55.40 %), Magara (44.44 %) and crossbred Patanwadi x Rambouillet (44.00 %). The rate of breedwise seroprevalence in sheep

did not differ significantly. However, in contrast to the present findings, Patel (2006) reported higher seroprevalence in Patanwadi than that in Marwari sheep. The possible reason for this variation may be number of samples tested form each breeds, season, location or clinical conditions prevailing in animals etc..No significant difference was observed among samples tested from the two breeds of goats. Mehsani breed showed 40.77 per cent seroprevalence, whereas non-descript goats showed 46.18 per cent.

According to the animal husbandry practices, samples were tested from animals of organized farms, Panjarapoles and migratory flocks. Among these, the highest seroprevalence was recorded from Panjarapoles followed by migratory flocks and organized farms. This could justify the management practices followed at organized farms where proper care is taken. Therefore, less seroprevalence is possible on such farms compared to Panjarapoles and migratory flock where no proper managemental practices are followed.

ACKNOWLEDGEMENT

Authors are very much thankful to Dean, College of Veterinary Science and AH, SDAU, Sardarkruhinagar for providing necessary facilities. Thanks are also due to Dr.R.K.Singh, Station-In-charge, IVRI, Mukteswar for providing c-ELISA kits. Help and cooperation provided by field veterinarians is also thankfully acknowledged.

REFERENCES

Furley, C.W., Taylor, W.P. and Obi, T.U. (1987). Vet. Rec., **121** : 443-447.

Khan, H.A., Siddique, M., Arshad, M.J., Khan, Q.M. and Rehman, S.U. (2007). Pakistan Vet. J., **27** : 109-112.

Krishna, S.V., Subharao, M.V and Shaila, M.S. (2001). Indian J. Anim. Sci., **71** : 228-230.

Osman, N.A., Ali, A.S., Rahman, M.E.A. and Fadol, M.A. (2009). Trop. Anim. Hlth. Prod. DOI 10.1007/s11250-009-9333-8.

Patel, R.K. (2006). M.V.Sc. Thesis, Submitted to Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar.

Patil, S.S., Raghavendra, A.G., Gajendragad, M.R., Bhure, S.K., Sengupta, P.P., Tiwari, B.B.; Balumahendiran, M. and Prabhudas, K. (2009). Indian Vet. J.86 : 118-119.

Pawaiya, R.V.S., Misra, N., Bhagwan, P.S.K. and Dubey, S.C. (2004). Indian J. Anim. Sci., **74** : 35-40.

Rashid, A., Asim, M. and Hussain A. (2008). J. Anim. Pl. Sci., **18** : 114-116.

Shaila, M.S., Purushothaman, V., Bhavasar, D., Venugopal, K. and Venkatesan, R.A. (1989). Vet. Rec. **125** : 602.

Singh, R.P., Sreenivasa, B.P., Dhar, P.; Shah, L.C. and Bandyopadhyay, S.K. (2004). Vet. Microbiol. **98** (1) : 3-15.

Szkuta, A.W., Roger, F., Chavernac, D., Yigezu, L., libeau, G., Pfeiffer, D.U. and Guitian, J., (2008). BMC Vet. Res., **4** : 1-10.

Venkataramanan, R., Bandyopadhyay, S.K. and Oberoi, M.S. (2005). Indian J. Anim. Sci., **75** : 456-464.

❑