Pakistan Veterinary Journal

ISSN: 0253-8318 (PRINT), 2074-7764 (ONLINE)
Accessible at: www.pvj.com.pk

SHORT COMMUNICATION

Evidence of Peste Des Petits Ruminants Virus Antibodies in Small Ruminants in Amuru and Gulu Districts, Uganda

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ARTICLE HISTORY

Received: February 24, 2011
Revised: April 08, 2011
Accepted: April 15, 2011

Key words:
Antibodies against PPRV
Goats
Prevalence
Sheep
Uganda

ABSTRACT

The study investigated evidence of antibodies against Peste des petits ruminants virus (PPRV) in apparently healthy sheep and goats in Amuru and Gulu districts in Uganda. A total of 474 blood samples were collected in thirty nine internally displaced persons (IDPs) camps in seventeen sub-counties, from goats and sheep with no record of previous vaccination. The prevalence of antibodies against PPRV in goats was 12.5 and 0% in Amuru and Gulu districts while in sheep the prevalence of antibodies against PPRV was 16.5 and 11.1% in the respective districts. This is the first report on PPR antibodies in small ruminants in Northern Uganda. There is need to determine the prevalence of antibodies against PPRV in other surrounding districts in Northern Uganda and an attempt should be made to characterize the circulating PPRV.

To Cite This Article: Sande R, C Ayebazibwe, C Waiswa, F Ejobi, FN Mwiine, W Olaho-Mukani, 2011. Evidence of peste des petits ruminants virus antibodies in small ruminants in Amuru and Gulu districts, Uganda. Pak Vet J, 31(4): 363-365.

INTRODUCTION

Peste des petits ruminants (PPR) disease is a viral disease of small ruminants characterized by high morbidity and mortality (Lefe`vre and Diallo, 1990; Khan, 2010; Abubakar *et al.*, 2011). Peste des petits ruminants virus (PPRV) belongs to the genus *Morbillivirus* in the family *Paramyxoviridae* PPR is the most socio-economically important disease of small ruminants in sub-Saharan Africa, the Middle East and Southwest Asia (Shaila *et al*., 1996 Farooq *et al.*, 2008). It decimates stocks, limits productivity levels and significantly inhibits trade in animals and animal products, heavily impacting on household incomes and food nutrition, especially in the pastoral communities.

The first outbreak of PPR was confirmed in the North Eastern Uganda (Karamoja region) and OIE notified in 2007 (NADDEC, 2008). Until today, there is scanty information on the epidemiology of PPR in Uganda (Wamwayi *et al*., 1995).

In Uganda, majority of animals are kept under agro-pastoral systems involving extensive livestock intermingling through communal grazing which favors disease spread (MAAIF, 2006). Northern Uganda is recovering from rebel insurgency, which destroyed most of the livestock population (Anonymous, 2003). Small ruminants play an important role in poverty alleviation and many organizations and programs, for poverty alleviation and restocking, are giving out goats to internally displaced persons (IDPs), returning to their villages (Anonymous, 2002). Until today, the distribution and prevalence of PPR in Ugandan goats and sheep have not been established yet this is necessary for instituting effective control measures. This study was aimed at determining evidence of antibodies against PPRV in small ruminants in Amuru and Gulu districts.

MATERIALS AND METHODS

The study was conducted in Amuru and Gulu districts, to assess evidence of PPRV antibodies in small ruminants in the communities gradually returning to normal life after a prolonged war that forced them to disperse later on settle in IDPs camps for over 20 years. In Uganda, the lowest administrative unit for animal disease reporting is a sub-county and thus sub-counties were the sampling units in which sheep and goats were selected for this study. The study sample size was

calculated using corrected PPR prevalence rates for goats 44% and sheep 29% derived from earlier studies (Awa *et al*., 2002) using the formula:

$$n = \frac{(1.96)^2 PQ}{L^2}$$

Whereby; n= required sample size, P= estimated disease prevalence, Q = 1-P and L= desired precision.

The number of samples was selected using probability proportional to population estimate of each species of animals in the area. Within each site animals were randomly selected using systematic sampling technique. A total of 474 samples (388 goats and 86 sheep) were collected in April 2009, from apparently healthy goats and sheep from 39 IDPs in 17/18 sub-counties, with no record of vaccination against PPR. Serological analysis of samples was undertaken at National Animal Disease Diagnostics and Epidemiology Centre (NADDEC). Geographical positioning system (GPS) readings were recorded for the various localities from which samples were collected so as to map the distribution of antibodies against PPRV in Amuru and Gulu districts (Fig. 1). It was not possible to trace the stock origins of different study animals beyond the localities of IDPs camps since most farmers had no proper animal records.

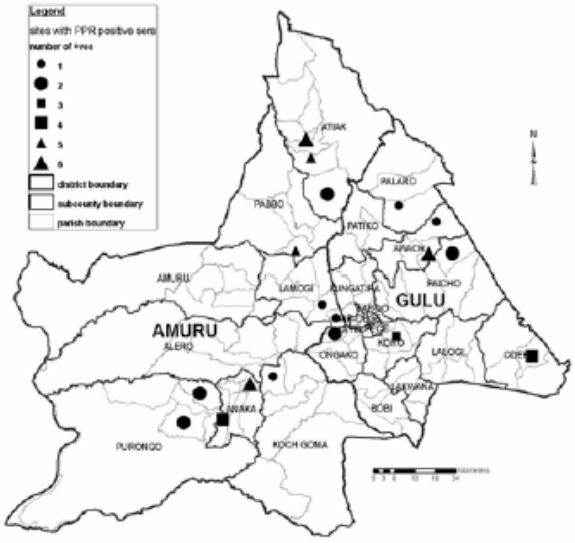

Fig. 1: Map of Amuru and Gulu districts showing the spatial distribution of antibodies against PPRV.

A standard protocol for the commercial PPR c-ELISA kit (CIRAD/EMVT®, Montpellier, France) was followed to determine the prevalence of antibodies against PPRV as described by Libeau *et al*. (1995). Raw data from individual animals were edited, coded and entered in MS Excel and later exported to SPSS software (Version 16.0). The statistical significance between species and administrative units was determined using the Pearson Chi-square (χ^2) test. P-values of <0.05 were considered significant. Prevalence rates were determined, by dividing the total number of positive samples to the total number of samples tested and expressed as percentages.

RESULTS AND DISCUSSION

Fifty four sera (11.4%) tested were positive for the presence of antibodies against PPRV (Table 1). Antibodies against PPRV were detected in samples from different sub-counties**,** the highest antibody responses in sheep were recorded in the sub-counties of Alero (66.7%) and Pabbo (25%), while for goats the highest antibody response were recorded in Anaka (42.8%) and none in Patiko (Table 1). The present study provided information on the prevalence of antibodies against PPRV in small ruminants. It is therefore evident that small ruminants in the study districts were affected by PPRV yet the disease had only been confirmed (prevalence 46.3%) within the Karamoja region (NADDEC, 2008). This indicated that antibodies against PPRV are as well present in other districts in Uganda. The Karamajong in Uganda are semi-nomadic pastoralists who rustle livestock and the raids and counter-raids often extend across other tribes in the neighboring districts and countries (Nussieba *et al*., 2009). PPR spread is sometimes enhanced through migrations (Abubakar *et al*., 2008). Government resettlement programs through livestock restocking to returnees from IDPs could have also contributed to the spread of PPRV. There is need to determine the prevalence of antibodies against PPRV in other surrounding districts in Northern Uganda and an attempt should be made to characterize the circulating PPRV in the two districts.

Table 1: Prevalence of antibodies against PPRV in sheep and goats in Amuru and Gulu District

District	Sub-county	Sheep (%)	Goat (%)	Total (%)
Amuru	Atiak	(2/17) 11.8	(11/50) 22.0	(13/67) 19.4
	Kock Goma	(0/2) 0.0	(1/37) 2.7	(1/40) 2.5
	Pabbo	(1/4) 25	(4/28) 14.2	(5/32) 15.6
	Lamogi	(0/4) 0.0	(1/24) 4.1	(1/28) 3.6
	Amuru	-	(0/4) 0.0	(0/4) 0.0
	Anaka	(0/5) 0.0	(6/14) 42.8	(6/19) 31.6
	Purongo	(3/13) 23.1	(3/47) 6.4	(6/60) 32.0
	Alero	(2/3) 66.7	(0/3) 0.0	(2/6) 33.3
	Sub-Total*	(8/48) 16.7	(26/208) 12.5	(34/256) 13.3
Gulu	Odek	(0/7) 0.0	(4/25) 16.0	(4/32) 12.5
	Ongako	(0/12) 0.0	(3/26) 11.5	(3/38) 7.9
	Bungatira	(0/2) 0.0	(0/18) 0.0	(0/20) 0.0
	Bobi	(0/4) 0.0	(0/23) 0.0	(0/27) 0.0
	Koro	(0/2) 0.0	(3/10) 30.0	(3/12) 25.0
	Lakwana	-	(0/3) 0.0	(0/3) 0.0
	Paicho	(0/5) 0.0	(2/28) 7.1	(2/33) 6.0
	Awach	(0/4) 0.0	(7/25) 28.0	(7/29) 24.1
	Patiko	-	(0/10) 0.0	(0/10) 0.0
	Sub-total**	(0/38) 0.0	(20/180) 11.1	(20/218) 9.2

*: Seroprevalence of antibodies against PPRV at 95% CI = 6.0-27.4% (sheep) and 8.0-17.1% (goats), p-value=0.443; **: Sero-prevalence of antibodies against PPRV at 95% CI=0.0% (sheep) and 6.4-15.6% (goats), p-value=0.031; -: No samples collected/ tested

Acknowledgements

The authors thank the NADDEC staff and the project for emergency control of PPR in Uganda (FAO/RAF/3113E) for the laboratory assistance. We acknowledge veterinary staff and farmers in Amuru and Gulu districts for their assistance and providing information during sample collection.

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