SHORT COMMUNICATION

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ACTIVITY OF BOVINE PARAINFLUENZA TYPE 3 VIRUS IN CATTLE IN NORTH EASTERN NIGERIA -A SHORT COMMUNICATION

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Abstract

Parainfluenza type 3 virus (PI3V) is a primary agent of Bovine Shipping Fever worldwide. The activity of the virus was accessed through a sero-survey using the haemagglutination inhibition (HI) test. Out of 656 cattle sampled from Adamawa, Bauchi, Taraba and Borno States, 51.37% were seropositive. The reciprocal of HI titres ranged between 21 and 212. The geometric mean HI titres ranged from 106 in Borno State to 686 in Adamawa State. The implication of these findings to the possible occurance of shipping fever along cattle routes is discussed.

Key words: Parainfluenza -3-virus, Cattle, Seroprevalence, North East, Nigeria.

Introduction

Parainfluenza type 3 (PI3) virus infection constitutes a primary component of shipping fever complex in cattle and small ruminants characterized by pneumonia and upper respiratory tract symptoms. Shipping fever is often associated with major loses in feedlots and animals on transit (Sweat, 1967; Keneth *et al.*, 1962). The disease has been described in parts of Africa including Nigeria (Kaminjolo *et al.*, 1979, Tylor, 1975).

With the national cattle herd concentrated in the Northern states of Nigeria and the dependence of the Southern States on the North for beef supply, supply cattle and other livestock are transported regularly across the country.

Animals so transported are subjected to the stress of shipping, hunger, thirst, harsh, weather and disease, hence the risk of contracting shipping fever.

Currently, data on the prevalence of PI3 virus in cattle in Nigeria is limited. The need to acertain the level of presence of the virus over a broad geographical area becomes imperative.

In this study, serological evidence of PI3 virus activity in North Eastern States of Adamawa, Bauchi, Taraba and Borno is presented. The degree of infectivity is determined by the haemagglutination inhibition HI titre range and geometric mean titres obtained.

Materials and Methods

A total of 656 serum samples were obtained from cattle in diverse localities of Adamawa, Bauchi, Taraba and Borno States in North Eastern Nigeria. The sera were subjected to Haemagglutination Inhibition (HI) test according to standard procedures (Dawson, 1964, Hamdy, 1965).

A local strain of the PI3 virus (Provost, 1973) and a rabbit anti-PI3 virus hyperimmune serum were obtained from Viral Research Department NVRI, Vom, Nigeria. The haemagglutination (HA) and HI tests were carried out in V-shaped bottom microtitre plates using 0-50ul single and 12-channel adjustable titertek finn pipettes attached with 200ul fine tips for dispensing.

For the HA test, a two fold serial dilution of the PI3 virus was made in duplicate in PBS(PH 7.4) from 1:2 dilutions in wells A1 and B1 to 1:1024 in A12 and B12 using 25ul of 0.5% washed fresh guinea pig erythrocytes to each well. The controls consisted of a pair of wells with the same volume of PBS without virus. Mixing of reagents was done by placing the test plate on a titre tirk micro-shaker and shaken thrice for 5 seconds each round.

One HA unitage was taken as a reciprocal of the viral dilution in the well that showed agglutination after 45 min. Four HA units was then calculated and used in the HI test.

The HI test involved making 25ul volumes of duplicate two-fold serial dilutions of test sera in microtire plates as described earlier. The positive serum control consisted of rabbit anti-PI3V hyperimmune serum (HIS) serially diluted in duplicates. Negative control consisted of serum obtained from an uninfected rabbit serially diluted in duplicates.

Twenty five microlitres of diluted 4HA units of virus was added to each well containing test serum and wells having positive and negative control sera. The plates were incubated for 10-15 minutes at room temperature. Thereafter, 25ul of 0.5% washed fresh guinea pig erythrocytes was added to all the wells of the plate and mixed.

The HI antibody titres were read after 45 minutes of incubation at room temperature as reciprocal of the last wells in which the RBC botton were formed (No aggulitination). The wells containing 4HA units of the serially diluted virus showed aggulitination titres of between 4 and 8.

Results

Out of the 656 serum samples tested, 337 (51.37%) were positive for PI3 virus antibodies. This comprised of 65%, 62.58%, 57.62% and 25.79% positive samples from Adamawa, Bauchi, Taraba and Borno States respectively.

Five percent (5%) of the samples hard HI titres below 16 while 94.82% had titres above 16 (Table 2). Seventy three percent (73%) of the samples had HI titres between 16 and 128 while 13.65% had titres above 128. The titres are presented in Table 1.

Table 1: Seroprevalence of PI3 virus in 4 States N.E. Nigeria

State	No. of cattle sampled	No.positive	% positive	GMT
Adamawa	160	104	65	686
Bauchi	155	97	62	453
Taraba	151	87	58	130
Borno	190	49	26	106

Table 2: Distribution of HI antibody titres

State	Reciprocal of HI Titres											
	2^1	2^2	2^3	2^4	2^5	2^6	2^7	2^8	2^9	2^{10}	2^{11}	2^{12}
Taraba	0	1	3	17	14	11	8	11	7	6	3	11
Adamawa	1	1	4	23	17	20	25	2	7	4	0	0
Borno	1	2	13	13	12	8	0	0	0	0	0	0
Bauchi	0	1	7	16	27	24	16	6	0	0	0	0
Total	2	5	27	64	70	63	49	19	14	10	3	11

Discussion

The detection of substantial levels of PI3 virus antibodies in cattle from the four states shows that virus activity is widespread in the North Eastern part of Nigeria. As vaccination against PI3 V has not been introduced in Nigeria, the high levels of sero conversion observed in this study are an indication of a repeated field challenge by wild virus. The PI3 virus is considered important agent of viral pneumonia of ruminants in Nigeria and other parts of Africa (Plowright, 1969; Kaminjolo, 1973; Obi, 1984).

Within the States of North Eastern Nigeria, there appears to be no obvious differences in the prevalence rates. There were no significant differences in percentage prevalence and Geometric mean HI titres (GMT) between Adamawa, Bauchi and Taraba states ($P<0.05$). Borno State however had lower percentage prevalence and GMTS than the other three ($P>0.05$). Cattle transported from highly endemic areas stand greater chances of contracting shipping fever than those from localities with low prevalence rates.

In conclusion, it is necessary to conduct a survey of clinicl cases especially along cattle routes to confirm or dispel the fears expressed based on these serological findings.

References

Dawson, P.S and Darbyshire, J.H. (1964). The occurance and distribution in the United Kingdom of antibodies to Parainfluenza-3 and Infectious Bovine Rhinotracheitis Viruses in Bovine sera. *Veterinary Record*, **76**(4): 111-115.

Hamdy, A.H (1965). Variants of Myxovirus parainfluenza-3 isolated from calves clinically affected with shipping fever. *Cornell Veterinarian*, **55**:623-630.

Kaminjolo, J.S., Gicho, J.N., Hamir, A.N. and Shatry, A.M. (1973). Isolation and characterization of Bovine parainfluenza virus from cattle in Kenya. *Bulletin of Epizootic Diseases of Africa*, **21**(4): 371-375.

J. Ibu, T. U. Ob, E. Aba-Adulugba (1996). Serological evidence of Parainfluenza type 3 virus infection of cattle in Plateau State. *Nigerian Veterinary Journal (special edition)*, **1**(1): 100-102.

Keneth, L., Heddleston., Robert, C. R., Lawrence P. Watko (1962). Notes on the transmission and etiology of Bovine shipping fever. *American Journal of Veterinary Research*, **23**:94.

Obi, T. U. (1984). Respiratory viral infections in Goats in Nigeria with empasis in Peste des petites ruminants. Les Maladies de la Chevre, Nort (France) 9th -11th October, 1984.

Plowright, W. (1969). Other virus diseases in relation to J.P. 15 programme. 1st Annual meeting of the joint campaign against Rinderpest (J. P.15), Mogadiscio Dec., 1969.

Sweat, R.L and Dunn, J.W (1965). Hysterectomy-derived, colostrums deprived, isolation-raised calves for disease research. *American Journal of Veterinary Research*, **26**:1309-1315.

Taylor, W.P., Momoh, M., Okeke, A.N.C, Abegunde, A. (1975): Antibodies to Parainfluenza-3 virus in cattle, sheep and goats in Northern Nigeria. *Veterinary Record*, **97**:183-184.

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