Sudan J. Vet. Res. Vol 5 1983

ISOLATION OF THE VIRUS OF INFECTIOUS BOVINE RHINOTRACHEITIS IN THE SUDAN.

M. EISA, Central Veterinary Research Laboratories,
P.O. Box 8067, Al-Amarat, Khartoum, Sudan.

INTRODUCTION:

Infectious bovine rhinotracheitis (IBR), a herpesvirus disease of cattle was first observed in California, U.S.A. (Miller, 1955). Since the early report of Madin & others (1956), IBR virus has been isolated in many parts of the world. Although this virus was originally recognized as causing bovine respiratory disease it is now known to be capable of eliciting a wide variety of clinical syndromes ranging from rhinotracheitis, abortion, encephalitis, conjunctivitis and keratoconjunctivitis to vaginitis, pustular vulvovaginitis (coital exanthema) and balanoposthitis (Andrews & others, 1978).

Based on virus isolation and /or serological evidence IBR virus has been shown to exist in a number of African countries including neighbouring Kenya (Bwangamoi & Kaminjolo, & Gicho, 1972; Jensett & Rampton, 1975), Egypt (Hafez & Frey, 1972; Mohsen & others, 1978) and Ethiopia (Lefevre, 1975). This communication records the first isolation of IBR virus in the Sudan.

MATRIALS AND METHODS

Disease History and Symptoms:-

While investigating the viral aetiology of bovine respiratory disease recently our attention was drawn to a sick calf on the Khartoum University farm at Shambat. This calf was a yearling male animal of the local Butana type that belonged to a group of 25 calves all kept since birth in open adjacent pens in complete isolation from their dams. The calf was apparently suffering from an acute respiratory disease characterized mainly by pyrexia (40.2°C) and profuse bilateral watery nasal discharge and slight lachrymation. The nasal mucosa was hyperaemic and the animal was depressed and off-food. Although there was obvious respiratory distress no cough was observed even when the animal was exerted. However, none of the in-contact calves showed any signs of illness.

The sick calf was immediately segregated from the rest of the herd which on further observation showed no evidence of spread of the disease, while the condition in the diseased calf progressively resoved

and in about two weeks the animal had completely recovered.

Nasal and conjunctival swabs collected from the sick calf were immediately immersed in tubes with 2 ml each of a transport modified Eagle's medium containing 200 units penicillin, 200 mg streptomycin and 50 units mycostatin per millilitre. They were transported on ice to the laboratory where they were left to soak overnight at (4°C) before being extracted and stored at - (20°C) unitl required for cell culture inoculation.

Virus isolation was attempted using primary calf kidney cell (CKC) culture obtained from neonatal calves. Processing of the swabs prior to inoculation and the virus isolation procedure were essentially the same as previously described (Eisa, 1980) except that inoculated cultures were maintained on serum-free modified Eagle's medium at (37°C). Cultures were scored negative if after three blind passages conducted at 7-day intervals they had shown no cytopathic effect (CFE).

RESULTS

The conjunctival swab yielded no virus throughout. A cytopathogenic agent, however, was recovered in the first passage from the nasal swab. CPE was discernible on the second day postinoculation. It consisted mainly of disruption of the cell sheet associated with the appearance initially of isolated rounded refractile cells followed by progressive rounding up and clumping of degenerated cells into groups of various sizes until the whole sheet was affected and eventually detached from the glass surface.

In preparations stained with haematoxylin and eosin prominent faintly eosinophilic Cowdry type A inclusions were seen. The virus isolate, designated NS/C19 attained a growth titre of 10^{-6} to $10^{6.5}$ TCID 50 per 0.1 ml in CKC culture.

A number of other cell culture systems including calf testicle cell culture and MDBK, BHK and Vero cells also supported growth of the isolate. The virus was non-haemadsorbing, neither did it haemagglutinate fowl, guinea pig, rabbit, sheep, goat, calf or horse erythrocytes at 4°C, 28°C, 37°C. It was sensitive to ether and chloroform but stable at 56°C for 30 minutes. It was completely inactivated by acid pH 3.0 though it withstood pH 9.0 and was nonpathogenec for mice and chick embryos.

Virus identification:-

Using a constant serum-varying virus neutralization test a significant seroconversion to the isolate was demonstrated in paired serum samples derived from the calf, the index of neutralization (IN) being equivalent to 5. On further extending the test, however, a known antiserum to the Colorado strain of IBR virus (Makin & associates, 1956) completey neutralized the isolate as it did the homologous virus (IN 6.5 and 7.0, respectively).

DISCUSSION

The NS/C19 virus isolate possessed properties very similar to those reported for IBR virus (Griffin and others, 1958; Sabina & Parker, 1983; Rweyemamu, 1971; Black and Slack, 1972). More conclusive findings obtained by serum neutralization indicated that the NS/C19 isolate is an IBR virus and that it was associated with the clinical syndrome of the calf. The isolation of virus from the respiratory tract might further support this conclusion.

To my knowledge no record is available to date of any IBR virus having been previously isolated, nor is there any serological evidence that it exists in the Sudan. Although the present isolate was implicated in the respiratory syndrome of the calf, its definite role in bovine respiratory disease has not been fully investigated. Further studies will be required to assess the significance in the Sudan of IBR virus in bovine respiratory disease and other conditions attributed to this virus at large.

SUMMARY

A virus identified as infectious bovine rhinotracheitis (IBR) virus was isolated from a nasal swab from a local Butana calf on the Khartoum University farm that suffered from an acute recpiratory disease syndrome. Seroconversion to the isolate was demonstrated in paired sera from the calf indicating association with the syndrome. However, the definitive role in the Sudan of IBR virus in bovine respiratory disease and other syndromes attributed to this virus at large has rot been assessed and has yet to be determined.

Acknowledgements. I am grateful to Dr. D.H. Roberts of the Central Veterinary Laboratory, New Haw, Weybridge, England for provision of the Colorado virus strain and antiserum; to Mr. M. Z. Abd Alla for technical assistance and the Under Secretary, Animal Resources for permission to publish this report.

REFERENCES

ANDREWS,
S.C., PEREIRA, H.G. & WILDY, P. (1978). Viruses or Vertebrates. 4th. edition, p. 322. London Bailliere Tindall and Cassell.

BLACK,
D.N. & SLACK, G. (1972). Archiv fur die gesamte virus-forschung. 39. 330.

BWANGAMOI,
O. & KAMINJOLO, J.S. (1971). Zentralblatt fur Veterinarmedizin. 18. 262.

EISA, M.
(1980). Veterinary Record. 106. 225.

GRIFFIN,
T.P., HOWELLS, W.V., GRANDELL, R.A. & MAURER, F.D. (1958). American Journal of Veterinary Research. 19.990.

HAFEZ, S.M.
& FREY, H. R. (1973). Bulletin of Epizootic Diseases of Africa. 21.5.

JENSETT, D.M.
& RAMPTON, C.S. (1975). in Veterinary Science. 18. 225

KAMINJOLO,
J.S. & GICHO, J.N. (1972). Tierarztliche Umschan. 27. 111.

IEFEVRE, P.C.
(1975). Revue d'Elevage et de Medicine Veterinaire des Pays Tropicaux. 28. 103.

MADIN, S.H.,
YORK, C.J. & McKERCHER, D.G. (1956). Science. 124. 721.

MILLER, N.J.
(1955). J. American Veterinary Medical Association. 126. 463.

MOHSEN, A.Y.
A., ELDEBEGY, A., NAKASHLY, S.A. & MOHAMED, Z. (1978). Journal of the Egyptian Veterinary Medical Association 38. 45.

RWEYEMAMU,
M.M. (1971). Tropical Animal Health and Production. 3. 156.

SABINA, L.R.
& PARKER, R.D. (1963). Canadian Journal of Microbiology. 9. 567.