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STUDIES ON PREVALENCE OF RINDERPEST (RP), BOVINE VIRUS DIARRHEA (BVD) AND INFECTIOUS BOVINE RHINOTRACHEITIS (IBR) ANTIBODIES IN EGYPTIAN SWINE SERA

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INTRODUCTION

The disease of pigs have received little attention in Egypt. There have been few published papers of virus isolation or surveys for virus antibodies as (Abo El-Hassan et al., 1989) who detected antibodies to RP virus in pig's sera and (Youssef et al., 1990) who demonstrated FMDV antibodies in swine sera.

Kindderpest is an endemic disease in Egypt, which flaired up among cattle and buffaloes at many farms in Egypt during March 1982 causing severe outbreaks and resulted in great economic losses (Abo El-Hassan 1986).

The sudden onset of this outbreak inspite of mass vaccination draw the attention to search for animals which may act as reservoir or inapparently contract the disease and disseminate the virus.

Natural infection of pigs with BVDV through contact with infected cattle has been reported by (Flynn and Jobes 1964).

BVD infection in pigs causes false positive reaction to test for swine fever (SF) or Hog Cholera (HC) antibodies and may protect against subsquent challange with HCV. The importance of this and other species as source of infection for cattle is unknown but it is likely that they can act as carrier host.

IBRV affects swine naturally in both the respiratory and genital form (Nelson et al. 1972). The virus was isolated from a boar affected with balanitis, from sows affected with vaganitis and from the vagina of a healthy sow (Saxegard and Anstad 1967).

Cattle are belived to be the principal reservoir of IBRV but the role played by swine and other species as reservoir is still unknown.

The aim of this investigation is to screen the antibodies to PRV, BVDV and IBRV in swine sera in order to clarify their role in establishing such infection.

MATERIAL AND METHODS

Serum samples:

A total of 128 blood samples were collected randomly from slaughtered apparently clinically normal pigs at Cairo abattoir. Sera were separated and stored at-20°C until used.

Viruses:

1. RPV vaccinal "kabete O" strain was kindly supplied by the Veterinary serum and vaccine research institute, rinderpest unit, Abbassia.
2. PPRV, PPR Egypt, 7 vero X 802-28 FEB 88 was kindly supplied by the Animal Health Research Institute,Dokki, Giza, Egypt.
3. IBR virus "Colorado strain" was kindly supplied by the Veterinary Diagnostic Laboratories, Ames, Iowa, U.S.A.

4. BVDV "Singer strain" cytopathogenic strain was kindly supplied by the Ames Iowa Laboratories U.S.A.

Hyper-Immune sera:

1. Rabbit anti RP hyper immune serum was kindly supplied by RP-unit, ASF/BT division, D.V.R.I., pribrgh, surrey, England.
2. PPR virus hyperimmune serum was kindly supplied from Virology, Laboratory, Institute of Animal Health Research, Dokki, Giza, Cairo.
3. Rabbit and goat anti IBR hyperimmune sera were kindly supplied by the Veterinary Diagnostic Laboratory, Institute of Animal, Health Research, Dokki, Giza, Cairo.
4. BVD hyperimmune sera, Iowa, U.S.A. in rabbit was kindly supplied from virology, Laboratory. Intitute of animal, Health Research, Dokki, Giza, Cairo.

Cells:

1. Vero cells, were obtained from the virology. Laboratory , Institute of Animal Health, Dokki. Monolayer culture cells were grown in E 199 medium supplement with 10 % NCS. This cells were used for the propagation of RPV and PPRV.
2. IBRV was propagated on MDBK, these cells were obtained as a cell line from Institute of Veterinary Serum and Vaccine Research and Production, Abbassia, Monolayer culture cells were grown in Eagle MEM supplement with 10 % N.S.C.
3. BVD propagated on primary bovine kidney (BK) cell cultures were prepared according to the method described by Hancok et al. ,(1959).

Serum neutralization test:

1. For detection of neutralizing antibodies against RPV in swine sera the test was conducted according to Rossiter and Jessell (1982).
2. Neutralization index between neutralizing antibodies against RPV and PPRV in swine sera were applied according to Buxton and Frezer (1977).

3. For IBR serum neutralization test was applied according to the method of Darcel (1975).
4. For detection of neutralizing antibodies to BVDV in swine sera the test was conducted according to Frey and Liess (1971).

RESULTS

Results are presented in Table (1) and (2). It is clear from (Table 1) that serum of pigs tested by serum neutralization test against RP virus showed that 36(27.9%) out of 128 serum samples were positive.

Nine samples (7 %) were seropositive to BVD virus while no neutralizing antibodies were detected in tested sera for IBRV. In (Table 2) eitht swine serum samples showed positive neutralizing antibodies to RPV to RPV were subjected to further serum neutralization index between RPV and PPRV. The results showed that the neutralizing antibodies detected in swine sera to morbillivirus group are related to PPRV.

Table (1): Neutralizing antibodies to RPV, BVDV and IBRV in swine sera.

Disease	Total Serum samples	+ve 1:4	+ve 1:8	+ve 1:16	Total +ve	% Total +ve	Total -ve
R.P.	128	13	17	6	36	27.9	92
B.V.D.	128	1	4	4	9	7	119
IBR	128	-	-	-	-	-	128

R.P. = Rinderpest.
B.V.D. = Bovine virus diarrhea.
I.B.R. = Infectious bovine Rhinotracheitis.

Table (2): Comparison of Neutralization indices to RPV and PPRV in swine sera.

Serum sample No.	Neutralization index	
	RPV	PPRV
1	2.2	3
2	2.2	3
3	2.2	3
4	0.0	0.7
5	0.7	3
6	1.4	2.2
7	2.2	3
8	2.2	3

RPV = Rinderpest virus
PPRV = Pester de Petite Ruminants Virus

DISCUSSION

The role played by pigs as a source of infection to other species is not clearly known in Egypt.

In the present investigation trials for detecting specific neutralizing antibodies against major virus infection in Egypt were studied.

Rinderpest, long regarded as the most devastating disease of cattle and buffaloes in Egypt.

The recent literature indicating that pigs is considered one of the natural hosts of RPV in the nature in some countries and added that swine can be infected but rearely devlop serious disease while other pigs may contract the disease in apparent infection (Scott et al. 1986). In order to clarify the situation of RP in pigs, S.N.T. was conducted on their sera. The results revealed that 27.9 percent of the tested sera were positive.

The relative high percentage of neutralizing antibodies against RP in swine sera in the present investigation plus the previous record of (Scott et al.1964) concerning the susceptibility, draw the attention to the important role of pigs in the epidemiology of RP in Egypt.

In order to determine whether the detected neutralizing antibodies belong to RPV or PPRV, neutralization index were conducted.

In (Table 2) the results revealed that the antibodies is mainly related to PPRV then RPV.

There results may be attributed to the close contact and raising of swine at the same place with sheep which may indicate a minor role played by pigs in the epidemiology of RP in Egypt.

Natural infection of swine with BVD was first reported from Australia in 1964, while isolation of BVD from naturally infected pig was first reported by(Fernelius et al. ,1973).

Low cross reacting serum antibody titres against HC caused by BVD infection were found in clinically normal pigs as well as those suspected of having HC.Our investigation showed that 7 % of tested sera were positive to BVD.

The present study are in agree with other workers as (Gutekunst Malmquist 1963) and (Snowden and French 1968) that neutralizing BVD viral antibodies in swine are produced by an active infection of swine with BVD viral agent and are not by the cross reacting antibodies against hog cholera. In pigs infected experimentally with Singer strain of BVD virus, BVD antibodies titres and cross neutralization titres against HC virus were detected by serologic procedures. Fernelius et al. (1973).

Unlike the BVD titres the HC titres develop later and remained low even after a second exposure to BVD virus. The serologic responce to the two viruses were considered an indication that in addation to their soluble antigens, the virus have in common some minor surface antigens).

Natural infection of pigs with IBR virus was recovered by Nelson et al. (1972) while isolation of the virus from natural cases of infection was reported by Woods et al. , (1968).

The results of our limited serologic survey using S. N.T. on swine sera against IBR indicated than no neutralizing antibodies were detected.Our result was in agree with Spradbrow (1968) who failed to detect neutralizing antibodies against IBRV in swine sera, but disagree with Dale et al. (1972) who recorded a percentage of 11.88 to IBR in U.S.A. in pigs sera.

The negative result of our limited survey on IBR may be attributed to either minimal contact between swine and cattle population in nature or due to insusceptipility of swine species in Egypt for IBR infection which needs later on a challange conformation.

It may concluded that swine may act as a reservoir or inapparently infected with both RP and BVD, while they do not play role in IBR infection.

SUMMARY

A total number of 128 serum samples collected randomly from swine, were examined for the presence of neutralizing antibodies against RPV, BVDV and IBRV. The results revealed that (27.9 %) were seropositive at titres of 1:4 or greater against RBV; (7 %) were seropositive at titres of 1:4 or greater against BVDV while no antibodies were detected in tested sera for neutralizing activity to IBRV.

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