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STUDIES ON PREVALENCE OF RINDERPEST AND PESTS DES PETITS RUMINANTS ANTIBODIES IN CAMEL SERA IN EGYPT

BY

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INTRODUCTION

Rinderpest (RP) or cattle plague and peste des petits ruminants are two important viral diseases in Egypt. The former is a disease of cloven hoofed animals; (Scott, 1967), affecting the Egyptian livestock, (Ismail, 1988). However, the later is a disease of small ruminants particularly goats then sheep, (Scott, 1981), and recently recorded in Egypt, (El-Sanousi et al., 1989). Both diseases are clinically and patho-morphologically similar, and their major target is the lymphoid tissues in both natural and experimental hosts, (Yamanouchi, 1980)

The two viruses causing these diseases are members of the genus of Morbilliviruses of the family Paramyxoviridae, (Fenner, 1976 and Gibbs et al., 1979). They are antigenically related and confer varying degrees of cross immunity in their susceptible hosts, (Imagwa, 1968; Orvall and Norrby, 1974 and Norrby et al. 1985). Serologically they can be differentiated by crosss serum neutralization test, (Hamdy et al., 1976 and Taylor 1979).

The host range of rinderpest virus is wide, and it involves the domesticated ruminants especially cattle and buffaloes as well as some wild animals, (Scott, 1974). While, the host range of peste des petits ruminants virus is not intensively investigated. In spite of mass vaccination of cattle and buffaloes against rinderpest, outbreaks still continue to occur occasionally. Searching for hosts other than the natural ones might be important in order to understand the reasons of maintenance of both viruses in the enzootic areas. The role which played by camels in the epidemiology of RP is the matter of controversy, however it is not studied before concerning the PPR virus.

This paper aimed to screen the neutralizing antibodies against RP and PPR viruses in camel sera.

MATERIAL AND METHODS

Serum samples:

A total of 142 blood samples were randomly collected from camels at Cairo abattoir. Sera were separated and stored at -20°C.

They were heat inactivated at 56°C for 30 minutes prior the test.

Viruses:

Live attenuated tissue culture Kabete-O strain of rinderpest virus was kindly supplied by the Rinderpest Department, Veterinary Serum and Vaccine Research Institute, Abassia, Cairo, Egypt. This virus was adapted to grow on Vero cell lin.

Peste des petits ruminants virus (PPR Egypt), 7 Vero, cell line 88 was kindly supplied by the Animal Health Research Institute, Dokki, Giza, Egypt.

Hyperimmune sera:

Rabbit anti-RP hyper immune serum was kindly obtained from RP unit, ASF/BT division, D.V.R.I., Pirbright, Surrey, England.

PPR virus hyper immune serum was kindly supplied by virology lab., Animal Health Research Institute, Dokki, Giza, Egypt.

Cells:

Vero cel line was used for both viruses; monolayers were grown in 199 medium supplemented by 10 per cent newly born calf serum.

Serum neutralization test (SNT):

Cross serum neutralization test was carried out using both RP and PPR viruses or each serum as described by Gibbs et al., (1979). The test as been done in microplates as previously mentioned by Rossiter and Jessett (1982). A constant virus varying serum neutralization test was used incorporating 2.0 ± 0.5 log $_{10}$ tissue culture infective doses as the challenge virus against doubling dilutions of sera. Hyper immune sera against the two viruses were used as a positive control.

Table (1): Percentage of total positive sera for RP and PPR viruses

VIRUS	Total samp.	+ve. 1:4	+ve. 1:8	+ve. 1:16	+ve. total	+ve. %
RP	142	3	10	4	17	11.9
PPR	142	1	4	1	6	4.2

RP = rinderpest
PPR = peste des petits ruminants

RESULTS

Serum neutralizing antibodies for rinderpest and peste des petits ruminants were demonstrated in 23

Taable 2: Results of cross serum neutralization test to differentiate anti bodies aganist RP and PPR viruses.

POSITIVE SAMPLES No.	ANTIBODIY TITERS * RP	PPR	POSITIVE SAMPLES NO.	ANTIBODIY TITERS * RP	PPR
1	8	2**	13	-	2
2	16	2	14	8	2
3	8	2	15	8	2
4	8	-	16	8	2
5	8	2	17	4	-
6	-	8	18	2	8
7	16	2	19	16	4
8	4	-	20	8	2
9	2	16	21	2	8
10	4	-	22	8	2
11	16	2	23	8	2
12	2	8			

RP = Rinderpest
PPR = Peste des petits ruminants
* = Represinted as a reciprocal of 50% endpoint dilution of serum aganist 100 $TCID_{50}$
** = Antibodiy titers 2 is considered negative
- = Negative

out of the 142 camel sera. Table 1 shows that 17 samples were reacted positively for the presence of neutralizing antibodies for rinderpest virus, which represents 11.9 per cent. On the other hand six samples out of the 142 had neutralizing antibodies for PPR virus. The highest antibody titers obtained was 1:16 for both viruses. The results of serum cross neutralization test is shown in table 2. It is obvious that most of the positive sera for the two viruses showed corss reaction. Out of the 17 positively reacted sera for RPV, only 4 did not shoe cross reaction with PPR virus. However, out of the 6 positively reacted sera for PPRV, only two did not show cross reaction with RP virus.

DISCUSSION

The present investigation revealed neutralizing antibodies against rinderpest virus in 17 out of 142 examined camel sera representing 11.9 per cent, Table 1. The previous findings of **Singh and Ata (1967)** demonstrated high neutralizing antibody titers by 28 days after subcutaneous inoculation of two camels with virulent field strains of rinderpest virus. These workers also showed that camels could develop low levels of neutralizing antibody after inoculation with attenuated tissue culture rinderpest virus. Taylor, (1968) could also detect neutralizing antibodies in experimenally infected camels with rinderpest virus. Our results and the above findings indicate that

camel could react serologically to rinderpest virus. On other hand, Scott and Macdonald (1962) failed to demonstrate rinderpest antibodies in camel sera.

Camel is not the animals species which subjected to vaccination program against rinderpest. Consequently, it that the positively reacted camels had acquired the infection naturally. Rinderpest is a disease of cloven hoofed animals, particularly cattle and buffaloes, Scott, (1967). It is suggested that these camels had contracted the virus through their contact with cattle and/or buffaloes. This is in accordance with the findings of Plowright, (1962). He found that camels were infected when in close contact with rinderpest infected animals.

Our results open the way for further investigations to indicate that there were active focci of rinderpest virus circulating in cattle and or buffaloes or these camels were exposed to the virus during previous outbreak. It is well known that infection with rinderpest virus results in a long term immunity, (Plowright, 1984). So that we can not confirm if these active focci are recent or old.

Neutralizing antibodies against peste des petits ruminants virus were demonstrated in 6 out of 142 examined camel sera, representing 4.2 per cent, Table 1. There is no available literature concerning any serological surveys about PPR virus in camels. Peste des petits ruminants is a disease of small ruminants principally goats then sheep, (Gibbs et al., 1979). Our finding showed that camel could react serologically to PPR virus. It is most likely that these positively reacted camels had exposed to the virus through their contact with small ruminants. However, the clinical response of camels to PPR virus had not been studied. It is recommended for further investigation on abroad scale under both notural and experimental consation of exposing camel to experimentally infect camels PPR virus and to study their response as well as the virus dissemination.

Cross reactions among the members of Morbilli viruses has been established (Imagwa, 1968 and Norrby et al. (1985); so that we have done a cross serum neutralization test in order to differentiate between the antibodies of RP and PPR viruses, Table 2. The results reflect this cross reaction where most of the positively reacted sera against RP virus showed reaction to PPR virus, too but in lower titers and vise verse.

It may be concluded that camel can be used as a monitoring animal in areas where RP or PPR viruses infected animals are existed. On other hand, it is essential that any serum sample shows positive titer (1:4) or more against RP virus should be tested against PPR virus, too in order to avoid the cross immunity which exists between the

two viruses and vise versa.

SUMMARY

Cross serum neutralization test was performed on 142 camel sera obtained from camels at Cairo abattoir. Seventeen out of the 142 sera were positive to RPV (11.9%), and, 6 sera were positive to PPRV (4.2%). Most of the positive sera showed cross reaction between RP and PPR viruses.

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