

SEROLOGICAL SCREENING FOR SOME VIRAL DISEASES ANTIBODIES IN CAMEL SERA IN EGYPT

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Abstract

Serum samples collected from 91 imported camels in quarantine centre at Seuz and 78 camels at Cairo slaughter house were investigated for the presence of some viral disease antibodies using Haemagglutination Inhibition (HI) and Liquid Phase Blocking Sandwich (LPBSE). The results proved the presence of antibodies against Parainfluenza-3 (PI-3), Rift valley Fever (RVF) and foot and Mouth (FMD) at 72.78%, 68.63% and 24.26% of the tested sera, respectively .

INTRODUCTION

Camels play an important role in the epizootiology and transmission of some viral diseases to animals and man (Lees 1909). Among these viral diseases, Foot and Mouth disease (FMD) takes a superior position as an important, highly contagious disease among cloven hoofed animals in which camels can act as symptomless carriers, disseminating the virus to other farm animals. On the other hand, Mousa *et al.* (1980 & 1984a) could detect high titers of antibodies against FMD virus in the sera of camels in Egypt.

The role of camels in the transmission of other several viral diseases including Rift Valley Fever (RVF), Para-Influenza-3 (PI-3), Camel pox and Rabies were proved by several authors (Mehnel and Bartenbach 1973, Burgemeister *et al.* 1979, Frigeri and Arish 1979, Meegan *et al.* 1979 and Bah *et al.* 1981).

As the importation of camels from different African countries is in an increasing manner, hence, it could play an important role in the epizootiology of these afore-mentioned viral diseases to other farm animals. The present work was planned to screen the different antibodies against these viral diseases using different serological techniques in the sera of both imported and native breeds of camels in Egypt.

MATERIALS AND METHODS

Samples

- 1. Serum samples from living imported camels:** A total of 91 serum samples were collected from recently imported camels from quarantine centre at Suez. These samples included 67 camels from Kenya and 24 camels from Djibouti.
- 2. Serum samples from Cairo slaughter house:** A total of 78 serum samples were collected from camels at Cairo slaughter house.

All serum samples collected from both living, as well as, slaughtered camels were inactivated at 56°C for 30 minutes, and kept at - 20°C to be used in the serological techniques.

Reagents

- 1. Foot and Mouth disease virus type (O):** Propagated in BHK cell line. Rabbit and Guinea pig anti-FMD sera were kindly supplied by Foot and Mouth disease department, Veterinary Serum and Vaccine Research Institute, Abbasia, Cairo.
- 2. Rift Valley Fever (RVF) antigen :** Sucrose-acetone extracted infected mouse liver prepared from Entable and Mouse prepared RVFV hyperimmune serum (HIMAF) were kindly supplied by NAMRU-3, Cairo, Egypt. These reagents were used in haemagglutination inhibition test.
- 3. Para-Influenza type-3 :** Reference antigen and antisera for haemagglutination test were supplied by Denka, Siken Co. Ltd., Tokyo, Japan.
- 4. Conjugated antibodies :** Rabbit anti-guinea pig IgG (H+L) peroxidase conjugate was used.
- 5. Substrate :** O-Phenylendiamine (OPD) in 0.1 Na₂PO₄ and 0.1 M citric acid

buffer (pH 5.0) was added as substrate.

Haemagglutination Inhibition (HI) test : The presence of Para-Influenza-3 (PI-3) and Rift Valley Fever (RVF) antibodies were detected using Haemagglutination Inhibition (HI) test according to the method described by Lennette and Nathalie (1979). Trypsin and Potassium periodate method was applied to remove non-specific inhibitors according to Anon (1973).

Liquid-Phase Blocking Sandwich ELISA (LPBSE) : Liquid Phase Blocking Sandwich ELISA was used to detect the antibodies against Foot and Mouth disease virus (FMD) according to the method described by Wieslaw *et al.* (1994).

RESULTS

A total of 123 out of 169 examined serum samples were positive for the presence of PI-3 antibodies in serological investigations using HI test giving a final positive ratio of 72.78%. The positive percentage from each of the examined camel groups appeared as 79.1% for camels imported from Kenya, 66.66% for camels from Djibouti and 69.23% for serum samples collected from camels at Cairo slaughter house in Egypt (Table 1).

Table 1. Screening of PI-3 antibodies in camels using HI test.

Locality	Sample No.	Antibody titers								%
		-ve	1/10	1/20	1/40	1/80	1/160	1/320	1/640	
Kenya	67	14	6	11	9	6	14	5	2	79.1
Djibouti	24	8	-	3	5	2	1	1	4	66.66
C.S.H.*	78	24	7	14	5	6	6	7	9	69.23
Total	169	46	13	28	19	14	21	13	15	72.78

* Cairo slaughter house

Results of RVFV antibodies using HI test indicated a total number of 116 positive samples out of 163 serum samples (68.63%) with antibody titers ranging from 1/20 : 1/1280. The positive percentages were 92.53% in camels from slaughter house at Cairo. These results are to be seen in Table 2.

Using the LPBE technique for detection of FMDV antibodies in camel sera, the results indicated 41 positive cases out of 169 total camel serum samples with a percentage of 24.26%. The positive percentages for each camel group were 22.38%

for camels from Kenya, 12.5% for camels from Djibouti and 29.48% for serum samples collected from camels at Cairo slaughter house (Table 3).

DISCUSSION

In the present study, the role of camels in the epizootiology and transmission of some viral disease agents has been investigated. A total number of 169 camel serum samples were collected from imported camels (91 samples), and from camels at Cairo slaughter house (78 samples) for screening the presence of antibodies against PI-3, RVF viruses.

Concerning the presence of antibodies against PI-3 virus in examined camel sera, the results indicated a positive percentage of 72.78% of the totally examined camel sera (Table 1). Also, the number of positive samples with antibody titers over 1/10 was 110 with a percentage of 65.08%. Dawson and Darbyshire (1964) considered a titer over 1/16 as a positive haemagglutination inhibition. These obtained results supported those of El-Tarabili *et al.* (1979) who could detect 55-95% positive camel sera for PI-3 antibodies in which the serum samples were collected at different periods. Also, our results are in agreement with those of Burgemeister *et al.* (1975) and Frigeri and Arush (1979) who could detect serum antibodies against PI-3 in over 80% and 67% of Tunisian and Somalian camels, respectively.

The serological screening of collected camel sera for antibodies against RVFV indicated that, 116 out of 169 camel serum samples were positive for RVFV antibodies (Table 2). The positive percentages were quite different among the examined camels imported from Kenya (92.53%) with antibody titers ranging from 1/20 - 1/1280, followed by camel sera collected from Cairo slaughter house (69.23%) with antibody titers ranging from 1/20-1/320. On the other hand, serum samples from camels imported from Djibouti were negative for RVFV antibodies. According to OIE Manual (1992) in countries with endemic Rift Valley Fever disease, titers below 1/40 are considered negative, titers ranging from 1/40-1/320 are considered doubtful, while, titers above 1/320 are positive. Regarding these OIE data, our results on serum samples from camels imported from Kenya could detect 5 samples with antibody titers of 1/1280 which could be considered as positive, and 25 samples with antibody titers ranging from 1/40-1/320 could be regarded as suspected for infection with RVFV, while, the remaining samples were negative for RVFV infection. The RVFV antibody titers in

serum samples collected from camels imported from Djibouti were less than 1/20 which could be considered as negative for RVF. On the other hand, screening for RVFV antibodies in serum samples collected from camels at Cairo slaughter house indicated the presence of 24 negative cases, and 54 samples with antibody titers ranging from 1/40 - 1/320 which could be considered as suspected for infection (Table 2).

Table 2. Screening of RVF antibodies in camels using HI test.

Locality	Sample No.	Antibody titers								%
		-ve	1/20	1/80	1/160	1/80	1/320	1/640	1/1280	
Kenya	67	5	1	4	11	3	7	11	5	92.53
Djibouti	24	24	-	-	-	-	-	-	-	0.00
C.S.H.*	78	24	13	27	5	6	3	-	-	69.23
Total	169	53	14	31	16	9	10	11	5	68.63

* Cairo slaughter house

Concerning the screening of camel sera for antibodies against FMDV using (LPBE) test, our results revealed a total positive percentage of 24.26% from all examined camel sera. Out of the 91 serum samples from imported camels, 18 samples were positive for FMD antibodies with a positive percentage of 19.78%, while, 23 positive cases out of 78 camel serum samples collected from Cairo slaughter house had a positive percentage of 29.48% (Table 3). These results supported those of Abou Zaid (1991) who reported positive FMDV antibodies using ELISA test in 23.5% of the examined camel sera collected from imported, as well as, native breeds of camels in Egypt. Moussa *et al.* (1986) could detect 5.4% camel sera Positive to FMDV antibodies from totally examined 1755 camels using Serum Neutralization Test (SNT) during the years 1977-1982. The differences in results reported by Moussa *et al.* (1986) and Wilson *et al.* (1984) may be attributed to the technique used for testing camel sera for FMDV antibodies, where, ELISA technique was reported to be more sensitive for detecting FMDV antibodies when compared with serum neutralization test. This was also proved by About Zaid (1991) who could detect in his investigation 23.50% positive FMDV antibodies in camel sera using the ELISA technique, while, this percentage was only 3.91% by using the SNT test.

In conclusion, the presence of different viral disease antibodies in the sera of imported and slaughtered camels may throw some light on the role played by camels in the epizootiology of such viral diseases among farm animals, particularly, for FMD in which the infected camels may develop only mild, less severe clinical signs (Baiko 1964) transmitting the virus to other farm animals, particularly cattle, leading to serious occasional outbreaks.

Table 3. FMD type (O) antibodies By LPBE test.

Locality	Sample No.	Positive	%
Kenya	67	15	22.38
Djibouti	24	3	12.50
C.S.H.*	78	23	29.48
Total	169	41	24.26

* Cairo slaughter house

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مسح سيروولوجي للأجسام المناعية ضد بعض الفيروسات في سيرم الجمال بمصر

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تم تجميع ١٦٩ عينة سيرم جمال من محجر السويس ومجزر القاهرة. تم فحص هذه العينات لوجود أجسام مناعية ضد كل من فيروس البارانتلوانزا - ٣ وحمي الوادي المتصدع باستخدام اختبار منع التلازن. كانت النتيجة ايجابية بنسبة ٧٢,٧٨% ، ٦٨,٨٢% بالترتيب. كما تم فحص العينات بواسطة اختبار الاليزا لوجود الأجسام المناعية ضد فيروس الحمى القلاعية وكانت النتيجة ايجابية بنسبة ٢٤,٢٦%.