Asian Journal of Scientific Research

ISSN 1992-1454

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Asian Journal of Scientific Research 1 (1): 85-89, 2008
ISSN 1992-1454

Seroprevalence of *Morbillivirus* Antibody and Abattoir Survey of One Humped Slaughtered Camels (*Camelus dramedarius*) in Maiduguri Municipal Abattoir Maiduguri, Nigeria

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Abstract: Retrospective survey for prevalence of *Morbillivirus* antibody was carried out in 400 camels slaughtered in Maiduguri municipal abattoir using Complement Fixation Test (CFT). The results of the retrospective study showed that complement fixing antibodies to *Morbillivirus* were prevalent in the slaughtered camels tested. An overall prevalence rate 154 (38.5%) of morbillvirus antibodies was found among the animals screened, 232 (58%) showed evidence of anti-complementary activities and 14 (3.5%) were negative. The survey of slaughtered camels in the municipal abattoir revealed increased camel importation during the months of April to May which coincided with the prolonged hot-dry season in the study area. The rainy season which coincided with the months of July to September is characterized by a decrease in the number of imported camels to Nigeria. It is therefore important that camels be included among the group of animals to be monitored for the activities of *Morbillivirus* like RPV/PPRV and to define their role in the epidemiology of the disease in Nigeria and elsewhere.

Key words: *Morbillivirus*, camel, abattoir survey, Maiduguri Nigeria

INTRODUCTION

Morbillivirus including *rinderpest* (RPV) and *Peste des petits ruminants* (PPRV) are contagious viral disease of domestic and wild animals caused by the genus *Morbillivirus*. It is characterized by high mortality in susceptible herd (Ambali *et al*., 1995; Sinnathamby, 2001; Renukaradhya *et al*., 2002; Khandelwal *et al*., 2003). The disease has been well investigated in cattle and small ruminant while little information exists in camel. Camel are traditionally used as transport, its role in supplementing animals proteins for human in terms of its milk and meat is presently attracting the attention of scientists in this part of the world (Radwan *et al*., 1992; Otim *et al*., 2003; Kang-Seuk *et al*., 2003). It has been reported that over fifty head of camels are slaughter daily in the Maiduguri municipal abattoir (Baba *et al*., 1994; Abubakar *et al*., 2005). However, most of these camels are imported from neighboring countries such as Niger, Sudan, Chad, Ethiopia and Somalia (Olaleye *et al*., 1989; Abubakar *et al*., 2005). This poses a lot of risks to the nation's herd particularly at this time of declaring Nigeria free of rinderpest (IAEA, 1999; NADIS, 2004; Kang-Seuk *et al*., 2003; Abubakar *et al*., 2005).

The resurgence of rinderpest recorded in Nigeria in the year 1980 with epizootics in 1983-1984 resulted in the lost of half a million head of cattle. The source of the outbreak was traced back to some country in the northern part of Africa (Ambali *et al*., 1995; Otim *et al*., 2003). It is therefore important

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that camels be included among the group of animals to be monitored for the activity of *Morbillivirus* like RPV and to define their role in the epidemiology of the disease in Nigeria and elsewhere. In this study preliminary efforts were made to determine the prevalence of antibody to *Morbillivirus*, an abattoir survey of slaughtered camel in Maiduguri municipal abattoir.

MATERIALS AND METHODS

A total of 400 blood samples were collected from slaughter camels (*Camelus dramedarius*) at Maiduguri municipal abattoir, Borno State, Nigeria between October and December, 2004, which coincided with the prolonged dry dusty harmattan period. Sera were separated by centrifugation at 1500 rpm for 10 min and stored into a sterile container, at -20°C until tested.

Virus Antigens

The *Morbillivirus* used in the complement fixation tests were tissue culture antigens of bovine origin, kindly supplied by LANAVET. Garuoa Republic of Cameroon.

Complement Fixation Tests

Serum was diluted 1:10 and heat inactivated at 56°C for 30 min to remove the possibility of anti-complementary reactions and tested in two-fold serial dilution with veronal buffer against optimum dilutions of the antigen and controlled. The positive and negative control sera were obtained from the same source as the antigen used at optimum dilutions determined by chequer-board titration.

Statistical Analysis

The prevalence of antibodies against the *Morbillivirus* was evaluated using the t-test by pair wise comparison of variables.

RESULTS

Out of the 400 serum samples examined for prevalence of antibodies against *Morbillivirus* using CFT, 154 samples tested positive which represent an infection rate of 38.5%. Considerable prevalence of antibody were recorded in the camel population tested, although much more higher percentage of anti-complementary activity were observed (58%) Table 1. However, significant difference was observed between the rate of seropositivity and the seronegetivity populations. There was no significance difference between the two sexes of camel investigated in terms of prevalence and also in anti-complementary activity (Table 2).

Table 1: Distribution of *Morbillivirus* complement fixing antibody in slaughtered camel in Maiduguri

Total No. tested	Positive No. (%)	Negative No. (%)	Anticomplementary No. (%)
400	154 (38.5)	14 (3.5)	232 (58)

Table 2: Sex distribution of *Morbillivirus* in slaughter camel in Maiduguri, Nigeria

Sex	No. of tested	Positive No. (%)	Negative No. (%)	Anticomplementary No. (%)
Male	200	84 (21.0)	6 (1.5)	114 (28.5)
Female	200	70 (17.5)	8 (2.0)	118 (29.5)
Total	400	154 (38.5)	14 (3.5)	232 (58.0)

Table 3: Monthly records of camel slaughter from January 2000-November 2004 at Maiduguri municipal abattoir Maiduguri, Nigeria

Years	Monthly distribution and total annual slaughter												
(%)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TAS
2000	140 (8)	145 (8)	70 (4)	50 (3)	204 (110)	113 (6)	93 (5)	16 (1)	76 (4)	127 (7)	352 (20)	388 (22)	1774
2001	429 (5)	840 (11)	648 (8)	905 (12)	1159 (15)	1354 (17)	580 (7)	189 (2)	60 (1)	604 (8)	509 (7)	530 (7)	7807
2002	755 (9)	405 (5)	888 (11)	1385 (17)	1486 (18)	1295 (16)	724 (9)	267 (3)	39 (0.5)	40 (0.5)	278 (3)	487 (6)	8049
2003	665 (8)	1035 (13)	569 (7)	1072 (14)	1146 (14)	272 (3)	316 (4)	281 (3)	457 (6)	797 (10)	700 (9)	550 (7)	7878
2004	736 (6)	820 (6)	1111 (8)	1672 (12)	1882 (14)	1458 (11)	1055 (8)	980 (7)	1240 (9)	1023 (8)	1533 (11)	-	13510

TAS = Total Annual Slaughter

Table 4: Sex distribution of annual camel slaughtered from January 2000-November 2004 at Maiduguri municipal abattoir Maiduguri, Nigeria

Years		Monthly distribution and total aunual slaughter												
(%)	Sex	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TAS
2000	M	78	83	41	30	114	63	50	10	41	71	202	248	1031
	F	62	62	29	20	90	50	43	6	35	56	150	140	743
2001	M	218	430	340	500	659	754	320	99	40	351	279	280	4270
	F	211	410	308	405	500	600	260	90	20	253	230	250	3537
2002	M	430	218	762	765	662	382	142	24	24	24	162	253	4292
	F	325	187	623	721	633	342	125	15	16	16	116	234	3757
2003	M	520	360	64	549	634	146	174	149	254	425	371	265	3911
	F	518	305	505	523	512	126	142	132	221	372	329	285	3967
2004	M	383	420	613	884	989	776	604	497	616	506	769	-	7057
	F	353	400	498	788	893	682	451	483	624	517	764	-	6453

TAS = Total Aunual Slaughter

An abattoir survey including record of annual slaughter between the years 2000-2004 has been show in Table 3. The slaughtered camel mostly imported from neighboring countries, significant increase in total annual slaughter was observed between 2002-2004 as compared to 2001-2002 (Table 3). It has also been observed that there is consistency in the higher number of male slaughter than female except for the year 2003, where some numerical difference were observed in favour of female (Table 4).

DISCUSSION

The results obtained in this study revealed the presence of antibodies to *Morbillivirus* among imported camels in this part of the conntry. This suggest considerably moderate activity of the *Morbillivirus* among camel population. Camels are fairly resistant to outbreaks of *Morbillivirus* like RPV and experimental infections with the RPV virus is reported to cause a relatively small increase in body temperature and an immnnological response (Yagil, 1982). The *Morbillivirus* antibodies observed in the present study could ouly have come from a natural infection of the camels, as there is no any documented evidence that camels are been vaccinated against RPV/PPRV in and aronnd Nigeria and more so vaccination against RPV was suspended in Nigeria since 1999. Some workers have earlier reported detecting RPV antibodies in camel sera in Nigeria using complement fixation test (Ambali *et al*., 1995; Abubakar *et al*., 2005) in Ethiopia using c-ELISA (Roger *et al*., 2001) and in wildlife (Anderson, 1995). The percentage Seroprevalence observed in this study is the higher than the 11% reported by Ambali *et al*. (1995) and the 21.3% reported by Roger *et al*. (2001). Probably because they might be presences of other members of the genus *Morbillivirus* who shared group specific antigen, the sensitivity and specificity of the employed test could also be responsible. The observed high rate of anti-complementary activities recorded could be attributed to poor sample storage due partly to erratic power supply that resulted in bacterial contamination.

The nature of camel husbandry system, which allowed camel to intermingle freely with other ruminants at grazing and water points and market places, the camel population can serve as a ready source of *Morbillivirus* infection for the ruminants, especially cattle. It should not be forgotten that

a mild strain of RP virus among cattle once have caused devastating effects among African buffaloes, eland and lesser kudu in Africa (Roger *et al*., 2001).

Considering the fact that Nigeria has been declared provincially RP free since 1998 and vaccination against the disease suspended in 1999 (IAEA, 1999; NADIS, 2004) makes the present finding very important. It is therefore important that camels be included among the group of animals to be monitored for the activity of *Morbillivirus* like RPV and to define their role in the epidemiology of the disease in Nigeria and elsewhere.

There is also the need to further subject these samples to more highly specific and sensitive diagnostic technique like cELISA to substantiate the prevalence a specific member of the *Morbillivirus* family among camel in the study area.

Frequent inter-tribal wars in the countries of Sudan, Somalia, Ethiopia and Chad have been affecting the exportation of camels to Nigeria from these countries (Baba *et al*., 1994; Abubakar *et al*., 2005). This could be partly responsible for the reduction in the total number of camel slaughtered at Maiduguri abattoir during the period 2001-2003 recorded in this study. In addition, the persistent wars have directly decimated the camel populations in these countries as a result of malnutrition, dehydration, disease and neglect. The flooding of River and Lake Chad basins along camel routes to Nigeria at certain periods of the year has made movement of camel caravans to Nigeria rather difficult. The period (January-May) of peak camel slaughter recorded in this study coincides with the hot-dry harmattan season when flooding river and lake basins is rare (Abubakar *et al*., 2005).

It has been shown that the number of camels in Nigeria is much less than the total annual camel slaughter in the country. As a result Nigeria continues to import camels from some of these African countries to supplement its sources of animal protein.

ACKNOWLEDGMENTS

The authors acknowledge with thanks the technical assistance of Mrs. Awa Dzikwi and Mr. Andrew Ali.

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