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PREVALENCE OF CAMEL BRUCELLOSIS USING DIFFERENT SEROLOGICAL TESTS

BY

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INTRODUCTION

Brucellosis in camels is a serious disease that causes economic losses beside its importance as a public health hazard (Higgins, 1963; Rutter and Mack, 1963 and Wilson, 1984).

According to the FAO/WHO animal health year book (1961), brucellosis in camels has not been recorded till that time in Morocco, Egypt, Sudan and other countries in Africa. Later on, camel brucellosis was recorded in Egypt by many authors with variable incidence as 10.92% by Hamada et al. (1963), 2% by El-Nahas (1964) and 14.2% by Ayoub et al. (1978) using tube agglutination test. Further studies were carried out by Fayed et al. (1982), who reported positive incidence of 5.6%, 6.6% and 8.3% using Rose Bengal, tube agglutination and Complement fixation tests respectively and by Zaghloul and Kamel (1985), who reported that 3 out of 37 camels were found to be positive to both Rose Bengal and tube agglutination tests.

However, no data are available about the prevalence of the disease among camels kept in contact with other farm animals as most of the previously mentioned studies were carried out on camels kept without contact with other animal species.

Eradication of brucellosis from different animal speices in Egypt is of national importance. Studying brucellosis in gorups of camels kept alone and in contact with other animals is of atmost importance to clarify the epidemiological role of camels in spreading the disease in Egypt.

In this work, a trial was made to ascrtain the prevalence of brucellosis in two groups of camels; one was kept in closed farms (Police Hagana Troops) and the other was raised in contact with other species of animals using different serological tests. The adsorption method was carried out in order to abolish the non-specific reactivity encountered in camel sera (Sunaga et al., 1983). Serological retesting of the samples was applied after adsorption.

MATERIAL AND METHODS

150 serum samples were collected from camels kept in closed farms (Police Hagana Troops) from different localities in Egypt.

36 serum samples were also collected from camels kept in close contact with cattle from different areas in Giza governoratr.

All sera were tested before and after adsorption against antigens of killed *Pasteurella multocida* and *Yersenia enterocolitica* "09" strains by a

modification of the method described by Turcotte (1975). Testing of camel's sera for brucellosis was carried out using the following tests:

Buffered Acidified Plate Antigen Test (BAPA): as described by Alton et al. (1988) using antigen supplied by Animal and Plant Health Inspection Service, National Veterinary Services Laboratories, Ames Iowa, USA.

Tube Agglutination Test (TAT): as described by Alton et al. (1975) using antigen obtained from Serum and Vaccine Researche Institute, Abassia, Cairo, Egypt.

Rose Bengal Test (RBT): as described by Morgan et al. (1978) using antigen obtained from Central Veterinary Laboratory, Weybridge Surray, England.

Rivanol Test: according to the technique described by Alton et al. (1988) using antigen and Rivanol solution supplied by Animal and Plant Health Inspection Service, National Veterinary Services Laboratories, Ames Iowa, USA.

RESULTS

The number of positive reactors to each serological test before and after adsorption in both groups of camels are shown in **Table (1)**. Regarding the first group of camels, before adsorption 7 out of the examined 150 samples were positive to one or more of the applied tests. 7 samples (4.66%) were positive to BAPA, 1 sample (0.66%) was positive (80 IU or more) and 3 samples were doubtful (40 IU) to TAT while 1 sample (0.66%) was positive to RBT. All examined samples were negative to rivanol test. After adsorption only one sample was positive to BAPA andRBT while the remaining samples gave negative results to the rest of the applied tests.

Regarding the second group of camels, before adsorption 6 out of the examined 36 samples were positive to one or more of the applied tests. 6 samples (16.66%) were positive to BAPA, 2 samples (5.55%) were positive (80 IU or more) and 1 sample (2.77%) was doubtful (40 IU) to TAT, 3 samples (8.33%) were positive to RBT and 2 (5.55%) were positive to rivanol test. After adsorption, 6 samples (16.66%) were still positive to BAPA while only 2 samples (5.55%) were positive to TAT, RBT and rivanol tests.

The correlation between the different applied serological tests used in this study was shown in Table (2).

Table (1): Number of positive reactors to each serological test before and after adsorption in both groups of camels.

Group	No. of samples	Adsorption	BAPA	TAT		RBT	Rivanol Test
				⩾ 80IU	40IU		
I	150	before	7	1	3	1	-
		after	1	-	-	1	-
II	36	before	6	2	1	3	2
		after	6	2	-	2	2

Group I = Camels kept in closed farms (Police Hagana Troops).

Group II = Camels in contact with cattle.

Table (2): Correlation between different applied serological tests.

Group	Adsorption	No. of +ve samples	BAPA	TAT	RBT	Rivanol Test
I	before	1	+	+	+	-
		3	+	±	-	-
		3	+	-	-	-
	after	1	+	-	+	-
II	before	2	+	+	+	+
		1	+	+	+	-
		3	+	-	-	-
	after	2	+	+	+	+
		4	+	-	-	-

Group I = Camels kept in closed farms (Police Hagana Troops).

Group II = Camelsin contact with cattle.

DISCUSSION

Serological tests are widely used for diagnosis of brucellosis and are the tests exclusively used in eradication programs (Morgan, 1967). In this study different serological tests were carried out to ascertain the prevalence of the disease samong two groups of camels. The first group was kept in closed herds related to the police hagana troops and the second one was kept in dose contact with cattle and other animal species.

In the first group the rate of positive reactors was detected before and after adsorption of camel sera with *Pasteurella multocida* and *Yersenia enterocolitica* 09 antigens. The overall incidence of positive reactors among this group was somewhat lower than in the second group. After adsorption the number of brucella positive reactors in the first group was again reduced specially those sera that reacted positively to BAPA (Table 1). The elimination of non-specific reactions to standard brucella antigens was successfully achieved by incubation of sera to be tested with related antigens specially *posteurella multocida* and *Yersenia enterocolitica* 09 (Mittal and Tizzard, 1981). This helped in eliminating cross reactions of sera when tested for brucella antibodies specially in herds with low serological incidence of the disease with the presence of some doubtful reactions (Allan et al., 1976, Bracewell and Corbel, 1979, Fayed et al., 1982, Sunaga et al., 1983 and Nada,1984).

Our results showed that the number of positive reactors among camels kept in contact with cattle was higher than that of the first group with very low incidence of non-specific reactions (Table, 1) , High incidence of serologically positive reactors among camels kept in contact with other animal species were reported by Hamada et al., 1963, El-Nahas, 1964, Ayoub et al., 1978 and Zaghloul and Kamel, 1985.

Camels of the first group were obtained directly from Sudan, kept in closed herds under good hygenic conditions; this might explain the lower incidence of positive reactors among this gorup. Therefore, we can conclude the possibility of spread of brucellosis between different animal species and this might explain the higher incidence of the disease in the second group. In other words; lateral

transmission of the disease between the different animal species can occur and play a serious role in spread of the disease.

Table (2) shows the correlation between the different serological tests applied in this study on sera before and after adsorption. RBT and rivanol test appeared to be more sensitive in detection of positive reactors to brucella antigens than other tests. BAPA is recently used as a screening test in brucellosis diagnosis but it must be confirmed by other serological tests (Angus and Barton, 1984).

The immunoglobulin classes of camel sera are of the I_gG_1, I_gG_2, I_gM and I_gA class as reported by Grover et al. (1983). In spite of the acidic pH (4) of the serum-antigen mixture; BAPA failed to differentiate the non-specific I_gM class to brucella antigen (Tizzard, 1982). This result explained the high incidence of false positive reactions encountered by this test in the first group of camels. Again this result showed that BAPA has to be evaluated on large scale before its use in diagnosis of camel brucellosis.

Elemination of non-specific reactions to brucella antigens encountered in camel sera appeared to be essential before application of serological methods fore diagnosis of camel brucellosis.

Finally we concluded that camels kept in contact with other animal species may play an important role in the epidemiology of brucellosis and hence the eradication of the disease in other species necessitates its control in camels.

SUMMARY

In this work a trial was made to ascertain the prevalence of camel brucellosis among 2 groups of camels; first group from closed herds and second from camels kept in contact with cattle. Different serological tests were applied on camel sera before and after adsorption of sera with Pasteurella and Yersenia antigens to eliminate non-specific reactors.

Serological incidence of the disease among the first group was much lower than in the second gorup. The role played by contact between different species of animals in spread of the disease was studied and agreement between different applied serological tests was discussed.

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