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SERODIAGNOSTIC STUDY OF SHEEP BRUCELLOSIS IN ASSIUT GOVERNORATE

(With One Table and One Figure)

By

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دراسة سيرولوجية تشخيصية عن البروسيلا فى الاغنام فى محافظة أسيوط

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أجريت هذه الدراسة على عدد ٢١٧٧٦ من الأغنام التابعة لستة مراكز فى محافظة أسيوط هى (أسيوط – منفلوط – الغنايم – صدفا – ابنوب-أبو تيج) لتحديد نسب الإصابة بالبروسيلا بين الأغنام فى المحافظة وذلك خلال الفترة من يناير الى ديسمبر عام ١٩٩٥ وقد تم فحص هذة العينات سيرولجيا بواسطة اختبارى الانتجين الشريحى المحمض المخمد والـروز بنجـال والعينـات الايجابية اجرى لها اختبارى التلازن الانبوبى والريفانول وأوضحت النتائج أن نسبة الإصابة فى الأماكن المختلفة كانت ٢,٢١٪ ، ١,٣ ٪ ، ٠,٦٣ ٪ ، ١,٩٩ ، ٠,٨٢٪، ٠,٧٧ ٪ على الترتيب كما تبين أن نسبة الإصابة بواسطة الاختبارات المختلفة كانت ١,٦٪ ، ١,٦ ٪ ، ١,٣٣ ٪ ، ١,٤٪ على الترتيب .

SUMMARY

A serological study was performed on 21776 sheep sera belonging to six locations in Assiut Governorate (Assiut, Manflaut, El-Ghanaiem, Sedfa, Abnob, Abo-teeg) to estimate the incidence of brucella infection among sheep in Assiut Governorate through the period from January to December 1995. All samples were serologicaly examined by Buffered acidified plate antigen test (BAPAT) and Rose Bengal plate test (RBPT) and positive samples were confirmed by tube agglutination test (TAT) and Rivanol tests.

The results indicated that the incidence of sheep brucellosis in the different locations were 2.21%, 1.3%, 0.63%, 1.99%, 0.82% and 0.77% respectively. The percentage of brucella infection among sheep by the different serological tests were 1.6%, 1.6%, 1.33%, 1.4% respectively.

Key words: Bucellosis-Sheep-Serology-Assiut.

INTRODUCTION

Brucellosis is still one of the important zoonotic diseases of a serious public heath and economy problem in many countries. Ovine brucellosis is mainly caused by *Brucella melitensis*, Ossola et al .*(1963)* were the first to isolate *Br. melitensis* from three sheep in a flock that were co-existing with a herd of goats in Argentina.

In Egypt, the spread of brucella infection among sheep was recorded as incidence of ovine Brucellosis to be 9.5% using tube agglutination test Zaki(1943). Alton (1963) found that out of 999 examined sheep 3.5% were positive reactors in tube agglutination test, while El-Olemy (1974) detected a higher infection rate of brucellosis among sheep , 4.92% by Rose- Bengal test and 3.79% by tube agglutination test. El-Gibaly et al. (1977) recorded 2% brucella positive reactors to serum agglutination test. Nashed (1977) estimated a lower infection rate of brucellosis among sheep in Assiut Governorate, 0.74% in Rose Bengal test and 0.25% by tube agglutination test. Furthermore, Salem (1981) recorded an incidence of 5.6% and Nada (1982) recorded an incidence of 2.31% brucella positive reactors by different serological tests. Abdel-Wahab (1985) mentioned that the percentage of sheep positive reactors was 0.4%, while Zaghloul and Kamel (1985) failed to detect any positive reactors among sheep in Assiut Governorate. El-Bauomy (1989) examined 925 sheep by using tube agglutination test, mercaptoethanol test, buffered acidiffied plate antigen test, Rose Bengal plate test and Rivanol test and he found that the positive reactors were 18.5%, 16.2%, 19.9%, 19.1%, and 15.03% respectively. Recently Kaldes (1990) recorded that the rate of brucella infection among sheep in El-Minia Governorate was 0.42%. A further study was done by Gadalla (1991) who recorded that the rate of brucella infection among sheep in Assiut Governorate was 0.84%. El-Gohary and Hattab (1992) at Behera Governorate reported that the percentage distribution of sheep positive reactors by Rose Bengal plate test was 10.7% and by tube agglutination test was 7.1%. A recent investigation obtained by Montaser (1995) indicated that the incidence of sheep positive reactors were 4.38%, 2.89%, 2.02%, 2.01%, and 2.006% by buffered acidified plate test, tube agglutiation test, Rose Bengal plate test, Mercaptoethanol and Rivanol tests respectively.

The present work attempts to investigate the incidence of brucellosis among sheep in Assiut Governorate to know the endemic area which help in the control of the disease.

MATERIAL and METHODS

A total of 21776 sheep blood samples were collected through the national brucellosis eradication programme from six locations in Assiut Governorate (Assiut, Manflaut, El-Ghanaiem, Sedfa, Abnob, Abo-teeg) during the period from January to December 1995. The collected samples were kept in the refrigerator overnight. The serum obtained was carefully decanted and transferred into 2ml sterile tubes. All the sera were subjected to the Buffered Acidified Plate Antigen test (BRAPAT) and Rose Bengal Plate test (RBPT) and sera which gave positive reactions were furtherly subjected to Tube Agglutination test (TAT) and Rivanol test.

The four used antigens were supplied by the serum and vaccine Research Institute, Abbassia, Cairo, Egypt. The techniques of RBPT, BAPAT and TAT were carried out according to Anon (1992), while that of Rivanol test was performed according to Anon (1984).

RESULTS

The results are shown in table (1) and Figure (1).

Table (1) : Illustrates the results of serological tests in the different locations.

Figure(1): Illustrates the incidence of ovine brucellosis in Assiut by different serological tests.

DISCUSSION

Brucellosis is still a serious problem due to its zoonotic and economic importance, and control of this disease in animals depends mainly upon the use of efficient diagnostic procedures. Efficacy of diagnosis depends on the quality of these tests in particular, sensitivity and specificity (Tizard, 1982). The diagnostic methods should insure the lowest possible incidence of false negative reactions (specificity) and false positives (sensitivity) to reduce to minimum the necessity to perform supplemental tests to make diagnosis. Unfortunately, non of the routine tests has these qualities, hence there is no single serological test will conclusively detect all cases of ovine brucellosis (Farina,1985).

The incubation period of ovine burcellosis is often prolonged and the occurrence of latent infection means that a single negative serological test cannot be relied upon for diagnosis in individual sheep (Radwan, et al. 1984). So in the present study four different serological tests (BAPAT, RBPT, TAT and Rivanol test) were performed for diagnosis of ovine brucellosis.

From the obtained results in this study (Table.1), it is evident that BAPAT and RBPT could be regarded as screening tests for detection of ovine brucellosis as they showed the highest percentage of positive reactors (1.6%) if compared with TAT (1.33%) and Rivanol (1.4%). This may by claimed to the higher sensitivity of these tests as reported by Davies (1971) and El-Bauomy (1989). Moreover, the acidic PH (3.65 in RBPT and 4.0 in BAPAT) of the Antigens used in these tests inhibit to a certain extent the activity of non specific immunoglobulins. On the other hand, TAT suffers to a certain extent from these specifications (Davis,1971). It is somewhat slow in detecting recently infected animals and may miss some cases of chronic infection, while RBPT is more efficient in the detection of early and chronic infection with brucellosis (Davies, 1971 and Montaser, 1995). TAT was included in these serological tests as it detects mainly IgM and IgG classes of antibodies (Barton, 1994).

From the obtained results in table (1) , it is obvious that Rivanol test is a useful and reliable test in detecting brucellosis without serious number of false positive and this result agrees with that mentioned by Huber and Nicotteli (1986) in which they recorded that Rivanol test was the dependable test to classify the positive reactors. It is a highly specific and an official diagnostic test as it detects mainly the presence of the specific IgG through the precipitation of IgM (Hamdy, 1992).

The obtained results in table (1) revealed that the incidence of ovine brucellosis in Assiut Governorate by BAPAT was (1.6%), RBPT (1.6%), TAT (1.33%) and Rivanol (1.4%). Several authors as Zaki (1943), Alton (1963), El-Olemy (1974), El-Gibaley, et al (1977), Salem (1981), Nada (1982), El-Bauomy (1989), El-Gohary and Hattab (1992) and Montaser (1995) reported an incidence higher than that obtained in the present study.

This may be attributed to that most of samples collected by those workers were obtained from infected herds which have a history of abortion. But in this study the samples were collected from six different localities representing the Governorate and including herds with or without history of brucellosis. So the obtained results could be regarded more or less real and perfect representing the actual status of ovine brucellosis in Assiut Governorate. Also this low obtained incidence may be due to the dry hot climate of Assiut Governorate in which brucella microorganisms cannot

survive for long periods and consequently may limit the spread of infection. Nashed (1977), Abdel-Wahab (1985), Kaldes (1990) and Gadalla (1991) reported a lower incidence than that obtained in the present study , while Zaghloul and Kamel (1985) failed to detect any positive cases of ovine brucellosis in Assiut Governorate.

It is obvious from table(1) that Assiut locality showed the highest incidence of brucellosis (2.21%) followed by Sedfa (1.99%), Manflaut (1.3%), Abnob (0.82%), Abo-teeg (0.77%) and the least incidence was detected in El-Ghanaiem (0.63%) which is more nearer to the desert where dry weather and high temperature were evident.

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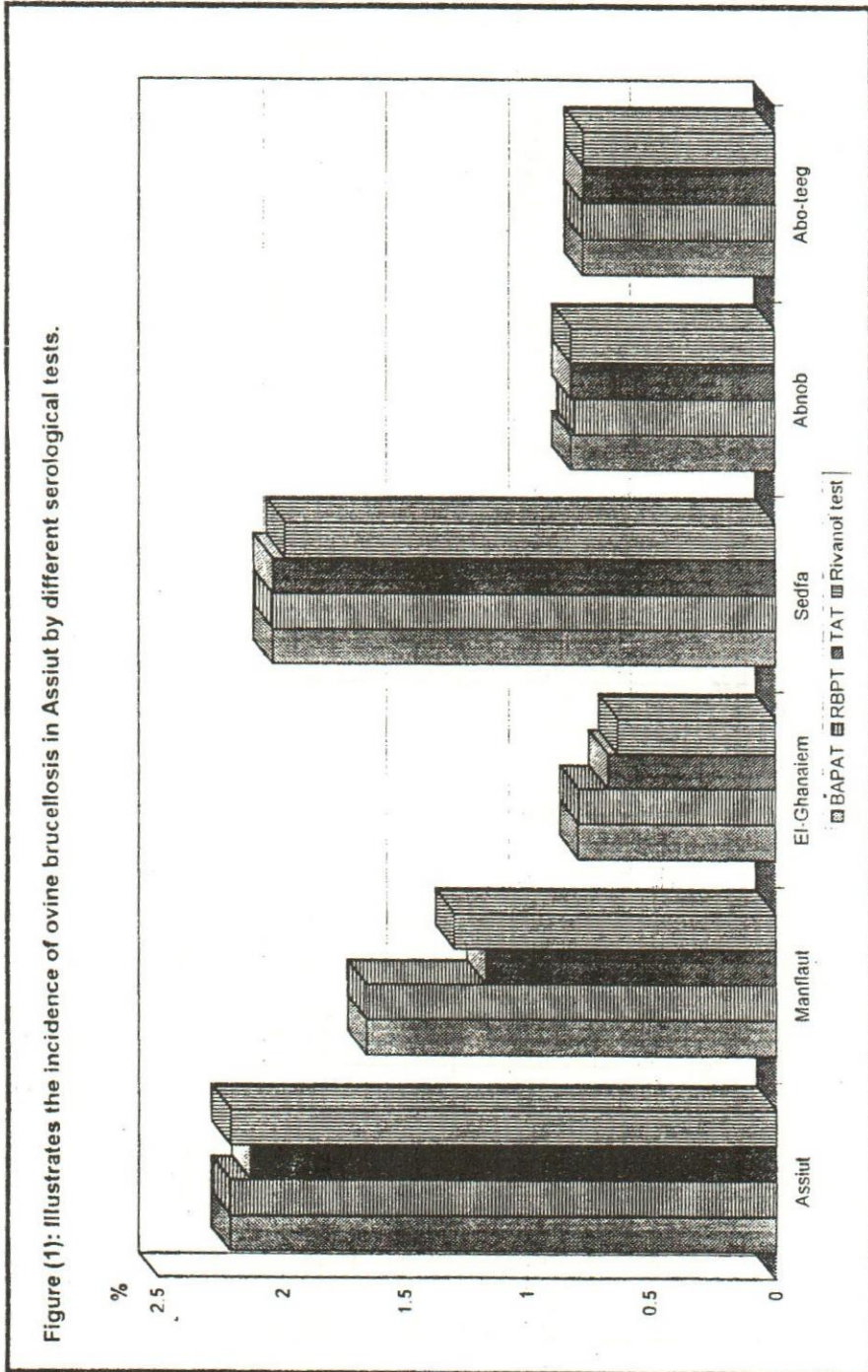

Figure (1): Illustrates the incidence of ovine brucellosis in Assiut by different serological tests.

Table (1): The incidence of brucella infection among sheep on Assiut Governorate using four serological tests.

Locality	No. of examined animals	BAPAT		RBPT		TAT									Rivanol test								Final conclusion			
													Total								Total			±	+	
		+	%	+	%	-	1/10	1/20	1/40	1/80	1/160	1/320	+	%	-	1/25	1/50	1/100	1/200	1/400	+	%	-		No.	%
Assiut	3890	86	2.21	86	2.21	3	19	25	23	11	3	2	83	2.13	-	8	9	13	31	25	86	2.21	3804	-	86	2.21
Manflaut	10884	181	1.66	181	1.66	54	45	29	38	13	2	-	127	1.17	39	38	33	26	21	24	142	1.3	10727	15	142	1.3
El-Ghanalem	2388	19	0.79	19	0.79	3	3	1	5	3	3	1	16	0.67	4	-	1	2	7	5	15	0.63	2372	1	15	0.63
Sedfa	2106	43	2.04	43	2.04	-	12	20	4	4	-	3	43	2.04	1	8	9	10	8	7	42	1.99	2063	1	42	1.99
Abnob	1338	11	0.82	11	0.8	-	-	1	10	-	-	-	11	0.82	-	-	2	-	6	3	11	0.82	1327	-	11	0.82
Abo-teeg	1170	9	0.77	9	0.77	-	-	4	3	2	-	-	9	0.77	-	2	2	-	3	2	9	0.77	1161	-	9	0.77
Total	21776	349	1.6	349	1.6	60	79	80	83	33	8	6	289	1.33	44	56	56	51	76	66	305	1.4	21454	17	305	1.4

BAPAT = Bufferd acidified plate antigen test

RBPT = Rose bengal plate test

TAT = Tube agglutination test

(-) = Negative results

(±) = Doubtful results

(+) = Positive resutls

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