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SEROPREVALENCE OF BRUCELLOSIS IN EQUINES IN ASSIUT GOVERNORATE

(With 3 Tables)

By

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إستبيان سيرولوجى للبروسيللا فى الفصيلة الخيلية فى محافظة أسيوط
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أجريت الدراسة بغرض عمل مسح سيرولوجى للبروسيللا فى الفصيلة الخيلية بمحافظة أسيوط، وقد تم فحص عدد ٢٦٢ حمار، ١٧ حصان، ١٤ بغل - من مناطق مختلفة بالمحافظة - سيرولوجيا للبروسيللا بإجراء اختبارات التلبد الأنبوى، الروزبنجال، الحامض المخمد المتوازن واختبار الكومب. وكانت نسبة المعايير الإيجابية لأختبار التلبد الأنبوى فى الحمير والخيول والبغال ٦١ و ٢٠٪، ٨٨ و ٥٪، ٤٢ و ٧١٪ على الترتيب ونسبة النتائج الإيجابية فى اختبار الروزبنجال ٩٧ و ١٢٪، ٨٨ و ٥٪، ٤٢ و ٧١٪ على الترتيب وفى المحض المتوازن ٣٥ و ١٣٪، ٨٨ و ٥٪، ٢٨ و ٦٤٪ وفى الكومب ٣٥ و ١٣٪، صفر٪، ٢٨ و ١٤٪ على الترتيب ايضا وقد أثبتت هذه النتائج أن إختبار التلبد الأنبوى هو أكثرها حساسية للكشف عن المرض سيرولوجيا فى الفصيلة الخيلية.

SUMMARY

A total number of 262 donkeys, 17 horses and 14 mules were subjected to serological examination for brucellosis by tube agglutination (TAT), Rose Bengal (RBPT), buffered acidified plate (BAPA) and Coomb's tests. The percentages of seroreactors for TAT were 20.61%, 5.88% and 71.42% in donkeys, horses and mules respectively. That of RBPT were 12.97%, 5.88 and 71.42%, while the BAPA revealed 13.35%, 5.88% and 64.24%. The Coomb's test gave 13.35%, 0% and 14.28% in donkeys, horses and mules respectively. The present findings proved that TAT was the most sensitive one for the serological detection of brucellosis among equines.

Keywords: seroprevalence, brucellosis, Equines, Assiut Governorate, Egypt.

INTRODUCTION

Brucella infection in equines is important not only as a clinical entity but also as a potential

source of infection for man and animals (DENNY, 1973).

In Netherland, 10% of horses were suffering from brucellosis

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(VAN DER HOEDEN 1960), while in Greece, the incidence was much little as DRAGONAS *et al.*, (1967) recorded it a 0.8%. In Assiut-Egypt, NASHED 1977) examined 112 horses and found that the incidence was 0%. In Iraq, the seroprevalence of brucellosis on 393 horse sera had been found to be 16.28% by using Rose Bengal test (ALI *et al.*, 1985), while YADAV *et al.*, (1991) stated that 11.82% of horses were infected with brucellosis in India.

Few literature dealing with brucellosis in donkeys showed that the incidence of the disease among them was 5.5% in Greece (DRAGONAS *et al.*, 1967), 27.05% in Sharkia-Egypt (EL BOHY, 1979) and 3.61% in India (YADAV *et al.*, 1991).

Fewer studies could be traced on brucellosis in mules; DRAGONAS *et al.*, (1967) detected infection in 2% of mules while YADAV *et al.* (1991) reported a higher percentage as it was 7.14%.

Brucellosis causes infertility in stallion and the organism can be detected in semen smear while the agglutination test, turns to be positive, (VANDEPLASCHE and DEVOS, 1960). Pregnant mares would abort on grazing with infected cattles with brucella (SHORTRIDGE, 1967; Mc CAUGHEY and KERR, 1967; CROSSMAN and BONSON,

1968) There is strong evidence that infected cattle is the main source of brucella for horse when both species grazed together, a relative high proportion of horses would become infected and develop a positive reaction to serum agglutination test. Some horses appear to suffer from a generalized infection with clinical signs including general stiffness, fluctuating temperature and lethargy as described by some workers (HUTCHINS and LEPHERD, 1968, BLOOD and HANDERSON, 1976 and ALI *et al.*, 1985) Sometimes, horses showed serum agglutination titres without any clinical signs of the disease and this latent or dormant infection would probably be the most common form of brucellosis in equines DENNY 1973).

The present work was carried out to present the prevalence of brucellosis among equines in Assiut province using 4 different techniques, TAT, RBPT, BAPAT and Coomb's test. The results of these tests were compared and evaluated.

MATERIAL and METHODS

I- Animals

A- Donkeys were gathered from three sources:-

1-169 animals of both sexes were collected from several localities belonging to Assiut Governorate. They were kept hospitalized suffering from different injuries.

2- 52 apparently healthy animals of both sexes from two village markets.

3- 41 animals of both sexes were working in two cattle farms with a past history of brucella outbreak. One of the farms was governmental and the other was a private one.

B- Horses: 17 apparently healthy animals of both sexes were belonging to police units.

C- Mules: 14 apparently healthy animals from a governmental stable.

II- Antigens:

Four serological tests were adopted for the examination of the above samples.

1- Standard *B.abortus* agglutination antigen for TAT was obtained from Vet. Serum and Vaccine Institute-Abbasia. The test was applied according to that described by ALTON *et al.* (1975).

2- Rose Bengal antigen was supplied from Merieux Institute-France and was performed as described by ALTON *et al.* (1975).

3- Buffered acidified plate antigen 0.5% phenol was obtained from SAS-Scientific San Antonio, Texas, USA, and was carried out as described by ANGUS and BARTON (1984).

4- Coombs antiglobulin was obtained from Biotest Diag-

nostics, Frankfurt, Germany. The method was that recommended by BEH and LACELLES (1973).

RESULTS

The results are shown in tables 1, 2 & 3.

DISCUSSION

Brucellosis appears to receive little attention in recent years especially in Egypt. Moreover study of brucella infection among equines is meagre since most of the authors dealt with the horse only, so a great deal of the efforts was directed to donkeys in the present work. The results of TAT on 262 donkey blood sera revealed that 54 (20.61%) were seroreactors at varying titres: 34 (12.92%) were positive at a titre of 1/10, 15 (5.72%) at a titre of 1/20, 4 (1.52%) at a titre of 1/40 and one case only (0.38%) at titre of 1/80. These results are near to those obtained by EL-BOHY (1979) in Sharkia province but much higher than that obtained by DRAGONAS *et al.* (1967) and YADAV *et al.* (1991) in Greece and India respectively; this may be due to the low incidence of cattle brucellosis in both countries. The seroprevalence of brucellosis among donkeys of the governmental hospital or village markets is the same as the incidence for both categories was 15.38%. This is logic because the epidemiological conditions in

either case are the same. On the other hand, the incidence of seropositive is much higher (48.78%) among donkeys working in previously infected farms. DENNY (1973) mentioned that infected cattle were considered the main source of brucellosis in horse when they were grazing together, while CROSSMAN, and BONSON (1968) isolated *Br. abortus* from stomach contents, liver, kidney and spleen of an aborted foal of a she donkey. So infected donkeys may act as a source of infections not only for man but also for farm animals especially in Egypt where they are mainly used in farm work.

The results of other serological tests on donkeys (RBPT, BAPAT and Coombs) revealed that they were less sensitive than the TAT since the seropositive were 34 (12.97%), 35 (13.35%) and 35 (13.35%) respectively. The superiority of TAT in diagnosis of equine brucellosis was also observed supported by DENNY (1972) and EL-BOHY (1979), while Mc CAUGHEY and KERR (1967) suggested that Coombs antiglobulin test was an accurate test for diagnosis of equine brucellosis due to the presence of "incomplete" antibodies in equine sera.

The present investigation recorded only one horse seroreactive at a titre of 1/10 by TAT from a total 17 horses tested with

an incidence of 5.88%. DENNY (1972) and MASON (1972) detected positive significant titer of 1/40 in 7.8% and 4.5% of tested horses respectively, while in the present work, the titre did not exceed 1/10. This may be due to the nature of the tested horses in this study since they were police horses kept in closed system stables away from other livestock giving no chance of infection from other infected animals. The same results were obtained by RBPT and BAPAT while the Coombs failed to detect the positive cases.

The present study revealed that the brucella seroreactors among mules were 7 (50%) at a titre of 1/10 and 1 (7.14%) at a titre of 1/20 and 2 (14.28%) at a titre of 1/40 with a total incidence of 10 (71.42%). Similar results were obtained with the RBPT and BAPAT showing positive reactions with 10 (71.42%) and 9 (64.28%) respectively, while only two cases (14.28%) were detected by Coomb's test. These findings may not express the real situation because of the small number of tested mules as well as the small number of mules in Assiut Province.

It could be noted that in the present investigation all the tested animals (hospitalized and apparently healthy animals) showed no clinical signs of brucella infection, even those which had high titres of 1/40 or more. This observation

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was examined by *DENNY (1973)* who reported that latent or dormant infection is the most probable form of brucellosis in the horse. Also Even experimental infection with *B.abortus* of a group of horses does not result in any clinical signs but serological response of the organism was both marked and prolonged (*MAC MILLAN et al. 1982*).

In Egypt where brucellosis is endemic, the low titre sero-reactive animals must not be neglected as it may be due to either recent or chronic infection but not due to cross-reactions. *CORBEL (1985)* reported that serological cross reactions produced by other organisms tend to be of little significance until the prevalence of the disease has fallen to a very low level.

CONCLUSION

Brucellosis in equines needs further studies and these animals must be tested together with other farm animals to exclude the positive cases since there is a great possibility of being shedders of the organism

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Table (1): Results of TAT for Brucella in Equines.

species	No	positive cases		Seroreactors									
				1/10		1/20		1/40		1/80		Total	
				No	%	No	%	No	%	No	%	No	%
Donkey	262	208	79.38	34	12.97	15	5.72	4	1.52	1	0.38	54	20.61
Horse	17	16	94.11	1	5.88	-	-	-	-	-	-	1	5.88
Mule	14	4	28.57	1	50	1	7.14	2	14.28	-	-	10	71.42

TAT = Tube agglutination test.

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Table (2): Results of TAT for Brucella in donkeys from different localities.

Locality	No of animals	Seroreactors					Total	
		1/10	1/20	1/40	1/80	No	%	
Governmental Hospitals.	169	19	6	1		26	15.38	
Village markets.	52	5	3	-	-	8	15.38	
Previously infected cattle farms.	41	10	6	3	1	20	48.78	
Total	262	34	15	4	1	54	20.61	

Table(3): Comparison between the RBPT, BAPAT and Coomb's test for Brucella in Equines.

Species	No	RBPT				BAPAT				Coomb's test			
		negative		positive		negative		positive		negative		positive	
		No	%	No	%	No	%	No	%	No	%	No	%
Donkey	262	228	87.02	34	12.97	227	86.64	35	13.35	227	86.64	35	13.35
Horse	17	16	94.11	1	5.88	16	94.11	1	5.88	17	100	-	-
Mule	14	4	28.57	10	71.42	5	35.71	9	64.28	12	85.71	2	14.28

RBPT = Rose Bengal Plate test.

BAPAT = Buffered Acidified Plate Antigen test.