

Survey of brucellosis in Cattle in AL-Diwaniya city

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Abstract

This survey has been done to evaluate the incidence of brucellosis in human and cattle due to its greatest zoonotic importance as well as its considerable effect on animal production. Two hundred and twenty blood samples from male and female cattle and 98 milk samples were collected from lactating cows during the year (2000). Rose bengal test has been used for detection of specific antibodies of infected animals in the blood while milk ring test has been used for detection of antibodies in the milk of infected lactating cows. The results of rose bengal test revealed that the disease in female was higher than that in male (33.3% and 11.2% respectively) while the results of milk ring test showed an incidence of 10.2%. The results of this study showed that the occurrence of brucellosis in cattle was higher in summer months than other seasons of the year.

Introduction

Within the genus brucella there are closely related species that have been recognized for many years. They are *B. abortus*, *B. melitensis*, *B. suis* and other species have been established, this important group causes brucellosis in domestic animal and man, infection and bacteremia is usually followed by localization in reticuloendothelial tissues, reproductive organs and less frequently bones and joints. In cattle, sheep and goats lesions of the female reproductive tract lead to death of the fetus and its expulsion thereby causing severe economic losses. The brucella may cause lesions in male reproductive tract in cattle, sheep, goats & dogs as well as bursitis in the horse (Fensterbank, 1986). Susceptibility of animals to brucella infection is influenced by age, sex and reproductive status of the individual animal, sexually mature cattle of either sex (Radostits et al 2000). The causative agent achieves its greatest concentration in the contents of the pregnant uterus, the fetus and fetal membranes must be considered as major sources of infection (Keppie et al., 1965). Demonstrated that sugar alcohol substance erythritol was a powerful growth stimulant of *Br abortus* and that susceptible species such as cattle, sheep and goats evince higher levels of erythritol in the placenta. The organism can survive on grass for variable periods depending on

environmental conditions, infectivity may persist for 100 days in winter and 30 days in summer (Radostits 2000). Grazing on infected pasture or consuming other feedstuff and water supplies contaminated by uterine discharges and fetal membranes from infected cows and contact with aborted fetuses and infected newborn calves are considered to be the most common methods of spread. Intra-herd spread occurs by vertical & horizontal transmission (Radostits et al, 2000), the disease was recorded in Iraq affecting many species of farm animals as well as human being (AL-Zahwi, 1988). AL-Hashaimy and Farid, (1969) mentioned that 2.3% of 500 blood samples of unvaccinated cow are infected by using tube agglutination in Baghdad province. Saeed, (1976) evaluated the serological test for the diagnosis of brucellosis, the study revealed that complement fixation test was the best followed by rose Bengal test & milk ring test respectively. (AL-Izzi et al, 1985) recorded by a survey of sheep brucellosis in Baghdad province that 6.59% of tube agglutination positive result and 7.9% of rose bengal positive result of 455 serum sample. (AL-Shammery, 1990) studied the causes of abortion in cows and found that the rose bengal and complement fixation tests efficiency are 43% of total 144 serum

sample of aborted cows. While of 851 serum sample of unaborted cows the efficiency of rose bengal and complement are 19.38% and 13.04% respectively . (Dhahir,1990) studied the causes of abortion in ewes and goats and found that complement fixation test was the best in diagnosis of brucellosis with 73.2% in aborted ewes and 15.5% in unaborted ewes

and 50.4% in aborted goat and 11.3% in unaborted goats .While the rose bengal 68.8% in aborted ewes and 14.4% in unaborted ewes and 24% in aborted goat and 6.4% in unaborted goat. (Al-Delami 1993) and Isood (1997) showed that rose bengal test and tube agglutination test were effective in diagnosis of brucellosis .

Materials and methods

1- Collection of samples

A- Blood samples

Two hundred and twenty blood samples were collected from male and female cattle. Five ml of blood withdrawn from jugular vein by vacutainer tube without anticoagulant , serum was separated by centrifugation of 3000 rpm for 15 minutes and stored at 4 °c .

B- Ninety eight of 4ml milk samples were collected under clean and sterile condition in clean tube and stored at 4°C.

Serological test

A-Rose bengal test (Morgan ,1967)

Serum samples and antigen left in the incubator at 37°C for 30 min .One drop (0.03ml) of serum sample put on white plastic plate by using micropipette. Shaking of antigen and put one drop(0.03)ml near serum drop. Then gently mixing of the two

drops by using plastic rod and plate shaken . After four minutes the results was read as the positive reaction showed agglutination by appearance of red precipitate granules indicate the presence of specific agglutination of brucella .

B- Milk ring-test(Alton and Johnes 1967)

After collection of milk was stored at 4°C for 24 hours, milk sample and antigen left at room temperature for one hour, milk sample shaken well and 1ml of milk put in clean small test tube .Add one drop (0.03ml) of stained ring antigen to the milk sample by micropipette .The mixture shaken gently to distribute the antigen with milk, the mixture left in the incubator at 37°C for one hour. The positive result showed blue ring of the creamy layer and white colour of milk column .

Results

1- Rose bengal test

Sixty six samples out of 220 serum samples, were of positive reaction in rose bengal test, with a total percentage of 30% (Table – 1).

The same table show that 56 female serum samples out of 168 total samples, were positive, with a percentage of 33.3% which consider to be higher when compared with 10 positive samples out of 52 total serum samples in males, with a percentage of 19.2%.

The results revealed that the incidence of brucellosis was higher in summer

and spring months of the year compared with other seasons (table- 2).

2- Milk ring test

The results of milk samples, examined by milk ring test listed in table (3), showed that the incidence of brucellosis was higher in summer season, especially on May and June. On other hand, the total positive reactions with this test showed a percentage of 10.2% which was lower than that of rose bengal test in female serum samples.

Discussion

As brucellosis is one of most important zoonotic infectious disease which cause heavy economic losses in animal production in addition to its communicable importance on public health many studies have been done in Iraq involved the incidence of the disease in different farm animal, its relation on human health and evaluation of tests used in diagnosis (AL-Hashaimy and Farid,1969;Saeed,1976;AL-Izzi et al 1985; AL-Zahawi ,1988;AL-Delami et. al, 1993;Isood,1997; Dhahir,1990,Jawad & Al-Ahami, 1982; Jawad, 1984).The clinically suspected infection in Al-Diwaniya city revealed that brucellosis is wide spread in cattle, sheep and goats as well as high risk groups of human .The result of rose bengal test showed that 30% of collected sample of cattle were seropositive in agreement with previous studies in other region of Iraq. Female showed high incidence rate 33.3% when compared with 19.2% in male which may be due to high concentration of erythritol in mature reproductive system mainly in placenta and pregnant uterus (Hagan& Bruner,1981; Keppie et. al, 1965).Spring and Summer months showed high incidence rate than other months of the year which may belong to the feeding type in this season which depend mainly on grazing of green stuff as well as increasing of calving, this will introduce a predisposing condition for pasture contamination by discharges and fetal membranes from infected cows which is the most common method of spread (Radostits et. al, 2000).Rose bengal test, as a screening test, used for detection of specific antibodies against brucella antigen in the serum of infected animal which

considered as high diagnostic efficient test for this purpose (Morgan et al 1969; Stenshorn et al,1985;Hornitzky, 1985).The result of milk ring test showed that 10.2% of the cases were positive with high rates in spring and Summer months, again this test consider as a good screening test has a satisfactory diagnostic efficiency in the diagnosis of brucellosis in aborted and non-aborted farm animals (Iknabie,1989; AL-Shimary ,1990).From results mentioned in this study, we expect that brucellosis is endemic in Al-Diwaniya city, as previously confirmed that the incidence of brucellosis infection in people from different countries of the world is associated with epidemic cases, animal raising and is closely related to the animal resources in a given region (Radostits, 2000). The consumption of unpasteurized milk and dairy products such as cheese and butter made from such milk in regions with high incidence of infected animal population is a major factor in the incidence of infection (Hagan and Bruner, 1981). It has been showed that regulation controlling the raising of domestic animals such as cattle, sheep and goats and the requirement of pasteurization of milk reduce the incidence of human brucellosis .In Cyprus for example the coordinated efforts of medicine, public health and veterinary medicine have brought brucellosis entirely under control (Economides, 2000).In similar way its incidence is rare in northern European countries ,only 4 cases of brucellosis were reported in Denmark between 1999 and 2000(Eriksen et. al,2002).In Kentucky in USA only 3 cases were determined in a 4 year period (Dotson et. al,1990).

Table (1): show the percentage of positive serum samples according to sex.

sex	No.of Animals	+ve samples	Percentage
Female	168	56	33.3%
Male	52	10	19.2%
Total	220	66	30.0%

Table (2): show the distribution of male and female positive serum samples according to months

Month	Female		Male		Total	
	Animals	+ve	Animals	+ve	Animals	+ve
January	15	3	1	0	16	3
February	13	3	3	0	16	3
March	18	6	4	2	22	8
April	17	6	3	1	20	7
May	17	5	4	1	21	6
June	16	7	5	2	21	9
July	11	7	6	2	17	9
August	12	7	7	1	19	8
September	11	8	8	1	19	9
October	12	3	5	0	17	3
November	12	1	4	0	16	1
December	14	0	2	0	16	0
Total	168	56	52	10	220	66

Table (3): show the positive results of milk samples.

Month	No.of milk samples	+ve results	Percentage
January	0	0	-----
February	10	0	0.00%
March	12	1	8.33%
April	14	1	7.14%
May	13	1	7.69%
June	10	3	30.00%
July	10	3	30.00%
August	9	1	11.11%
September	9	0	0.00%
October	7	0	0.00%
November	4	0	0.00%
December	0	0	-----
Total	98	10	10.20%

References

- Al-Delami,A.K; Dhahi,S.H.; and Hassan, B.K.(1993). comparative study of serological tests used in the diagnosis of ovine and caprine brucellosis. The veterinarian.3 (1): 22-27
- Al-Hashimy,T. and Farid, A.(1969).The status of bovine brucellosis in Baghdad as indicated by seroagglutination: Vet. Med J.XVI NO.17:191-194.
- Al-Izzi,S.A.;Al-Bassam ,L.S. and Al-Delami A.K.(1985).A study on ovine brucellosis in Baghdad . Iraq .J.vet.med.9:19
- Al-Shamehy ,M.F.(1990). study about the bacterial causes of abortion in cattle M. Sc. Thesis Vet. Med. College University of Baghdad.
- Al-Shamary H.A.,Whitt,C.J.and Wright S.G.(2000).Risk factors for human brucellosis in Yemen :a case control study. Epidemiol. Infect 125:309-313.
- Al-Zahawi,S.(1988). Brucellosis in Iraq.Bull Int. Hyg. Publ. 30:155.

- Alton, G.a. and Johnes, L.M.(1967). Laboratory techniques in brucellosis. Geneva world Health organization Monograph Series No.55.
- Dhahir,S.H.(1990):Bacteriological and serological study for some causative agents of abortion in sheep and goats,PH.D.Thesis Vet.Med.College,University of Baghdad .
- Dotson,R.;Maguire,S.M.and Hayden,J.(1990). brucellosis an unusual cause of fever in Kentaucky J.Ky. Med Assoc. 88:389-392.
- Economides,P.(2000).Control of zoonoses in Cyprus. Rev.Sci. Tech .19:725-734.
- Eriksen,N.;Lemming,L. and Hojlyng,N.(2002). Brucellosis in immigrants in Denmark.Seand .J. Infect Dis. 34:540-542.
- Hagan, E.L. and Bruner,B.C.(1981). Infectious disease of domestic animals 7 th .Ed. Cornell Unive. Press Ithaca and London
- Hornitzky,M. and Searson,J.(1986) . The relation between the isolation of Brucella abortus and serological status of infected non-vaccinated.Aust. Vet.J.63:172-174.
- Iknabie,M.Y.(1989). Epidemiological and diagnostic study of brucellosis in goats. M.Sc. Thesis Vet. Med Coll.Unive. of Baghdad.
- Isood,H.A.(1997). Epidemiological and diagnostic study of communicable diseases in cattle Ph.D.thesis Vet. Med. Coll. Unive. Of Baghdad.
- Jowad,A.H.(1984). Brucellosis in camel in Iraq. Bull. End.Dis.Vol>24-25 No.1-4:45-50.
- Jowad, A.H. and Al-Ahami, S.B.(1982). seroepidemiological study on brucellosis in Iraq Bull. End.Dis. xx-xx1:107-110.
- Morgan,W.J; Mackinnon, D.J.;Lawson, J.R. and Cullen,G.A. (1969). The rose bengal plate agglutination test in the diagnosis of brucellosis Vet.Rec. 85:636-641.
- Saeed,A.M.(1976). Evaluation of diagnostic procedures for bovine brucellosis M.Sc. Thesis Vet. Med Coll.Unive. of Baghdad.
- Stenshorn, B.W.,Forbes, L.B.;Eaglesome M.D.;Nielsen, K.H. and Samagh, B.S.(1985) A comparison of standard serological tests for the diagnosis of bovine brucellosis in Canada .Cand. J.comp. Med. 44:391-394.
- Radostitis ,O.M. Blood,D.C. and Gay,C.C. (2000). Vet. Med. A text book of the diseases of cattle, sheep ,goat pig, and horse 9 th Ed. Bailliere Tindall, London, Philadelphia.

مسح وبائي لمرض الاجهاض الساري في الابقار في مدينة الديوانية

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الخلاصة

اجري هذا المسح بهدف تقييم مستوى الاصابة بمرض الاجهاض الساري في الابقار في مدينة الديوانية نظرا لتأثيره الكبير على الصحة العامة فضلاً عن تأثيره على المستوى الانتاجي للحيوانات. تم جمع 220 نموذج دم من ذكور واناث الابقار و 98 نموذج حليب من ابقار في مرحلة الادرار. استخدم فحص (Rose Bengal test) وفحص حلقة الحليب (Milk ring test) للكشف عن الاجسام المضادة في دم وحليب الحيوانات المصابة على التوالي. بينت النتائج بأن الابقار هي اكثر عرضة للاصابة من الذكور ، أذ بلغت النسبة 33.3% في الابقار مقارنة مع 11.2% في الذكور فضلاً عن ذلك فقد اشارت النتائج الى ان نسبة الاصابة كانت عالية في اشهر الصيف من السنة .