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Clinical investigation about the zoonotic situation of brucellosis in rural area of Salaheddin governorate-Iraq

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ABSTRACT

Brucellosis is a common zoonotic diseases affecting half a million people annually. The most common way of infection is caused by consuming unpasteurized milk and contaminated milk products, as well as direct contact with animals and aborted cases. The general manifestations are those of fever with generalized symptoms. In this study , we investigated clinically the seroprevalence of brucellosis in rural area of Salaheddin governorate which was compared to the seroprevalence of the disease of other related studies that was done in urban area of the Salaheddin province . Blood samples as well as serum samples were collected which then went through serological tests that include both ELISA and rose Bengal test. The results of our study indicated that the positivity for livestock keepers of sera were 23 % in rose Bengal test and 18 % in ELISA test while the percentages in animals were 15 % rose Bengal test and 9 % in ELISA test in both cow and balls which was significantly higher than the prevalence that was done in urban area of Salaheddin province . Taken together, our data indicated that direct contact to the animals may be one of the reasons which may explain the high number of cases compare that to the urban area.

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Introduction

Brucellosis is a disease that caused by different bacteria of the genus *Brucella*, of which most species are pathogenic to multiple mammals, including cattle and humans [1].The most species of Brucella are both *Brucella abortus* or *Brucella melitensis*. These bacteria cause a chronic infection with preferred localization in the reproductive system, where they can cause abortion in pregnant cows or other reproductive problems, as well as reduced milk production in lactating animals and orchitis in bulls [2].

Food, especially raw dairy products considered as a mediator to initiate the infection with brucella species by consuming unpasteurized milk or may be another method of contact which is by direct contact with contaminated materials such as aborted fetuses, embryonic membranes, or vaginal discharge from aborted animals and infected animal carcasses which leading of invading the bacteria through skin abrasions, mucous membranes of the respiratory system, conjunctiva of the eye, or droplets [3].

In animal, Brucella infected sexually mature productive animals, such as cows, sheep, goats, pigs, dogs, horses, buffalo, reindeer and camels [4]. Some types of Brucella have also been isolated from marine mammals and rodents. The most important clinical signs are abortion in pregnant animals, retained placenta, and mastitis in dairy animals,orchitis and epididymitis in males [5].

Awareness, considerations and educational resources are considered such an important parts that may help decreasing the seroprevalence of the diseases especially the zoonotic disease [6],thus it has been established by the animal health organization that educational resources and training courses must be needed for the rural communities around the world which are essential in order to decrease the rate of infection which may leading to decrease the cost of treatments [7].

Materials and Methods

Collection of samples

Human samples: a total of 100 blood samples which were collected equally from both gender male and female (50 sample of each gender) within age between 10-60 years and those people were mainly an animal's breeders, Rural area of Salahaddin governorate were the only main spot that the samples collected from suggesting the main focusing in this study the rural area. The breeders were subjected to venous blood sampling under sterile conditions using sterile syringes, blood collected in gel tube. Then centrifuged at 4000 rpm for 5 minutes to obtain serum samples for serology. All tubes being tested were frozen.

Bovine sample: a total of 8 aborted cows, 36 healthy appearance adult cows, 10 healthy appearance ox, 10 ml blood were collected from jugular vein by sterile syringes, in to gel tube. Then centrifuged at 4000 rpm for 5 minutes to obtain serum samples for serology. All tubes being tested were frozen.

Brucella Tests

A rapid agglutination slide test for Detection of anti-brucella antibody in the animals and their owners that has been done by using of rose Bengal kit (Atlas Medical company – Germany).

Enzyme linkage immune sorbent assay (ELISA) (Bovine ELISA) : Indirect ELISA test for detection of anti brucella IgG in serum sample which has been done based on the manufacture instructions (Human Brucellosis ELISA Kit- My Biosource).

Enzyme linkage immune sorbent assay (ELISA) (Human ELISA): Indirect ELISA test for detection of anti-brucella IgG in cows serum samples: done by use of (Cattle Brucellosis Antibodies ELISA Kit- Elabscience Biotechnology).

Results and Discussion

The results in the current study indicated a positive result in both genders of male and female with both types of tests including Rose Bengal and ELISA tests as listed below in the table 1.

Table (1): seroprevalence of brucellosis based on gender in livestock keepers which was done by Rose Bengal and ELISA tests.

Cow breeders gander	Number of blood samples	Positive to Serological Tests (No: rate)	
		Rose Bengal test	ELISA test
Male	50	9 (18%)	7 (14%)
Female	50	14 (28%)	11(22%)
Total	100	23 (23%)	18 (18%)

On the other hand the results of both rose Bengal and ELISA tests in cows indicated also a positive results for brucellosis in healthy and aborted cows as listed below in the results of table 2.

Table (2): Seroprevalence of brucellosis based on gender in live stock (cattle) which was done by rose bengal test and ELISA tests.

Bovine groups	Number of blood samples	Positive to Serological Tests (No: rate)	
		Rose Bengal test	ELISA test
Aborted cows	8	6 (75%)	6 (75%)
Healthy cows	36	4 (11.1%)	3 (8.33%)
Healthy bulls	10	1 (10%)	0 (0%)
Total	54	15 (27.7%)	9 (16.6%)

Brucellosis is among the most important zoonotic infectious diseases worldwide affecting both humans and domestic animals [8]. The present study aimed to assess, investigate and compare clinically the seroprevalence of brucellosis in rural area of Salaheddin governorate and compare that with the seroprevalence of the same disease in urban area from other studies, the results of our study indicated that the positivity for livestock keepers of sera were 23 % in rose Bengal test and 18 % in ELISA test while the percentages in animals were 15 % rose Bengal test and 9 % in ELISA test in both cow and balls in both cow and balls, these results identified with another study which showed that the brucella is a contagious disease that has been playing an important role as a contagious disease in both human and animal[9].

Geographically, since this study has been done in the rural area of Salaheddin governorate, so the results show a highly seroprevalence for brucella infection compared with another study which was done in Salaheddin area but in the urban part [10,11] , these results giving rise of infection for the rural area as an suitable environment with highly chance of infection for the livestock keepers more than urban area. may results of the current study indicated a highly seroprevalence compared with another study in the same area but in the urban part of Salaheddin province while also showing at same time that brucellosis reported in rural area more than urban area which agree with [12]. Another study in Europe support our data as this study indicating the role of rural area enhancing the brucellosis [13]. Another study which has demonstrated the role of rural area an enhancer for brucellosis showing that rural area playing role increasing chances of infection through direct contact with livestock and dairy animals [14]. In summary, the current study show that in addition to the direct contact with animals, poor awareness, polices and resources are among causes for increasing Prevalence of brucellosis in both humans and animals which may link that with increasing the seroprevalence of brucellosis in the rural area compared to urban area of Salaheddin governorate which is accept with [15].

Conclusions

The conclusions of our study indicated that the positivity for livestock keepers and animals (bulls and cows) were significantly higher than the prevalence that was done in urban area of Salaheddin province . Taken together, our data indicated that direct contact to the animals may be one of the reasons which may explain the high number of cases compare that to the urban area.

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التقصي السريري عن نسبة الاصابة بالبروسيلا في المناطق الريفية والحضرية

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الملخص

داء البروسيلات مرض مشترك يصيب نصف مليون سنويا. اكثر طريق للاصابة بواسطة الاستهلاك الحليب غير المبستر ومنتوجات الحليب الملوثة وايضا طرق الاتصال المباشر مع الحيوانات المصابة والاجنة المجهضة. الميزة الرئيسية لهذا المرض الحمى. في هذه الدراسة بحثنا سريريا عن انتشار البروسيلا في المناطق الريفية والحضرية في محافظة صلاح الدين. اخذت عينات الدم ومصل الدم واجري عليها فحص وردية البنغال وفحص الاليزا. النتائج كانت للاشخاص المصابين بنسبة 23% في فحص وردية البنغال و18% في فحص الاليزا اما الاصابة في الحيوانات كانت بنسبة 15% في فحص وردية البنغال و9% في فحص الاليزا ومن خلال النتائج تبين ان نسبة الاصابة في المناطق الريفية اعلى من المناطق الحضرية وهذا يأحذنا الى انه من الاسباب الرئيسية هي الاتصال المباشر بين المربين والحيوانات.