The Prevalence of Brucella Agglutinins In Karadach District Among Human, Goats & Sheep

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SUMMARY

A preliminary investigation on the prevalence of Brucella agglutinins among farmers and animals was carried out during a 6 months period (Feb - July /1995). 2131 blood samples were collected from man and animals, including goats, sheep and only 4 cattle.

Sera were separated for both card and tube agglutination test. Out of 215 human serum samples 118 (54.8%) and 85 (39.53%) were positive by card test and tube agglutination test respectively, 520 (27.13%) and 374 (19.51%) positive serum by above tests were shown respectively from a total of 1916 animal sera.

The economical and public health hazards of brucellosis are highlighted, the essential investigation and further studies for a control program and eradication of this disease are also discussed.

INTRODUCTION

Brucellosis or Malta fever is a well known, world wide distributed zoonosis, which is a specific disease of animals and transmitted to man, by direct or indirect. It causes a heavy economical loss, due to the decrease of animal products. It is one of the public health hazards and environmental contaminants.

This disease has been well know in European and Mediterranean countries particularly afterthe discovery of the causative organism by Sir David Bruce in 1887. Human infection follows drinking of unpasteurized milk of infected goats, sheep or cattle, it is also transmitted to man through other unpasteurized dairy products like fresh cheese, and through contaminated or by direct contact with infected raw pork (1). It is most common in farmers and workers who deal with animals and their products (2) . Brucellosis in animals is characterized by abortion in female, orchitis with involvement of accessory sex glands in the male and may produce infertility in both male and female (1) . Malta fever or undulant fever in human may show diverse clinical manifestation which leads to false or late recognition (3) .

In Iraq including Sulaimany province the number of aborted animals has increased progressively in the last 30 years (Veterinary authorities personal communication). In 1966 Nielsen (4) reported brucellosis among sheep and goats from Baghdad , Mathur et al (5) and Karim et a al (6) showed the incidence of brucellosis among cattle, sheep and goats of the northern region of Iraq.

From 1980 - 1982 a serological survey was carried out among animals of governmental farms, including Serwan / Halebja governmental farms, 70 Km east of Sulaimany, which showed many positive reactors (7). Since the number of clinically infected human and animals is increasing tremendously due to its endemic nature, wherever susceptible animals are raised in large numbers (8,2,9), and due to local unsanitary dairy products, particularly local fresh white cheese and lack of hygienic control (10,11) .

The prevalence of brucella agglutinins among man and cattle near Baghdad was reported by Hikmet *et al* (12). Hussain *et al* (13) reported a serological evidence of brucellosis among asymptomatic humans in the Erbil area, in the northern part of Iraq.

The aim of the present study was to determine the degree of brucellosis prevalence, particularly in brucella suspected man and animals, in the Karadach district, 40Km south of the Sulaimany city center. The aim also included the demonstration of the actual hazard of this disease, concerning the public health and economy in the area.

The present study is based on serological tests of animals, including all males, and only females with an abortion history .The same tests were also carried out for related farmers who had shown brucella clinical manifestation.

MATERIALS & METHODS

A total of 2131 blood samples were collected including 215 humans, 1610 goats, 3302 sheep & 4 cattle, from 62 villages in the Karadach district, south of Sulaimany province.

Human blood samples were collected from farmers and related persons who showed symptoms like fever, back and joint pain, night sweating and headaches with an age of 6-60 years. Blood samples collected from female animals with an abortion history and males of the infected herds. Separated sera, using centrifugation, were preserved at -20 °C.The serological tests were performed at local veterinary laboratories and the microbiological laboratory of the medical college, university of Sulaimany. The Bengal test, containing antigens of *Brucella abortus* and *Brucella melitensis* (Rhone Merieux, Lyon, France) for brucella agglutinin

card test was applied and the standard tube agglutination test was used for confirmation of positive results using Antigen sets of the same firm mentioned above, containing only *Brucella abortus* antigen . Agglutination in 1/40 dilution with known antigen was recorded as a positive reactor.

All tested animals were marked (ear tagged) and isolated . Most of the positives were collected, compensated, and later slaughtered in Sulaimany abattoir then inspected by a veterinary surgeon and the discarded organs were burned in the incinerator. The rest of the positives died or were slaughtered by their owners prior to the process of compensation.

The positive farmers were sent to the human Islamic clinic and diagnostic laboratory in Sulaimany for more accurate diagnosis and confirmation of our card test. This clinic also participated in the project by prescribing the treatment, besides confirming the diagnosis, free of charge.All positive cases were provided with free antibiotics, till complete recovery by MEDICO, a humanitarian international organization, who also paid a fair compensation to the farmers for their positive animals.

RESULTS

The results are shown in Table 1 , from 215 human sera 118 (54.8%) and from 1916 animal sera 520 (27.13%) were positive by card test, 85 human sera (39.53%) and 374 animal sera (19.51%) were positive by the tube agglutination test.

Human positive sera by card test involved 41 (35%) males and 77 (65%) females, with a male: female ratio of 1:1.8 .

positive males and females have mean ages of 26 and 32 years respectively . From 85 positive human sera by the tube agglutination test, 30 and 55 positives were males and females respectively .

Positive children from the total 118 positive human sera by card test were only 5 (4.2%) they have a mean age of 9 (range 6-12) years, with a male : female ratio of 4:1.

An approximate animal account in the karadach district and positive results are shown in Table 2. The positive animals slaughtered in Sulaimany abattoir and elsewhere were 296 and 171 respectively, 48 were slaughtered by their owners and 32 died (Table 3).

DISCUSSION

Brucellosis in Iraq has been known as an endemic zoonotic disease (8,9). The main source of human infection was raw milk and unpasteurized home-made white cheese, which is mainly produced in northern Iraq (12). Previous studies in northern Iraq showed the incidence of brucellosis which was 3..1% in cattle, 1.0% in sheep and 4.4% in goats (5) . In 1979 Karim *et al* (6) has reported more or less similar results in the same area, using the card test. The results were 0.93% in sheep and 4.4% in goats, which approximately agrees with our results in the present study (Table 1) .

In 1974 and 1975 human brucellosis in Mosul was recorded , 12 out of 101 and 19 out of 185 suspected cases respectively (6). Hikmet *et al* (12) reported 13 positive cases of the 910 human serum samples from dairy production stations near Baghdad. In present study the incidence of positive cases was much higher (Table,1) , since our samples were taken from who showed Malta fever symptoms and who had lived in far rural areas.

It is probable that the present enforced Embargo is highly related to the tremendous spread of infectious diseases in the area like Malta fever. The Embargo has also caused poverty, low standard of life, shortage of medical and veterinary services, lack of vaccines and medicine, particularly antibiotics. These factors may explain the increasing number of Malta fever cases, comparatively with the number of cases 20 years ago (local health authorities, personal communication).

Al-Freihi et al (14) recorded a human male to female distribution ratio which was 2.3:1 among 70 patients within the median age of 35 years (range = 5-70 years), but in this study we recorded a ratio of 1:1.8, this variation may be to the fact that in our study almost all human blood samples were taken from rural areas. However Hussain et al (13) pointed out that the higher ratio of positive

cases were in rural areas rather than in urban areas comparatively, and they also reported that a higher ratio of positive females were recorded in rural localities rather than males, since females were highly involved in taking care of animals e.g cleaning, milking, etc., which all agrees with our present results.

In this study we also observed the low incidence of positive children , only 5 (4.2%) within a mean age of 9 (range 6-12) years, the male: female ratio of positive children was 4:1 . This point was also suggested by Al - Frelhl et al (14), and Madkour et al (15), who only found 4 patients (6%) under the age of 15 years. The variable ratio between the male and female children in the present study may be related to the local social customs, since in rural societies male children are more involved in rearing and handling of animals than female children.

There are many reports concerning implication of home - made white cheese as a main source of Brucella infection in man (10,11), and on the other hand Ramsay and Emond (16) pointed out that cheese is probably safe due to the effect of lactic fermentation which destroys the bacteria. The local home- made white cheese might probably not be involved, due to its incomplete, ripening and fermentation (17). However Dabbagh et al (18), reported higher positive results among families producing home-made yogurt than those producing home-made cheese. In our study , this latter point was held true , since among families included we observed that the consumption and production of a type of home-made yogurt, which was characterised by a thin consistency i.e not boiled enough in order to produce a larger bulk of product to earn more income or to get more butter fat according to their attitude. Therefore the Brucella bacillus may have a better chance to survive, besides the probability of more contamination of the produced yogurt and the environment particularly when the infection is endemic in the area.

No animal vaccination has been carried out against brucellosis in the area (veterinary authorities in Sulaimany, personal communication). Thus positive serological results shown in this study could not have been caused by other factors except the Bruceila infection.

The present investigation represents the first report on the serological prevalence of brucellosis among farmers, related persons and among productive farm animals in the Karadach district, which included 62 villages. As far as we know this project can be considered as the first complete chain project in Iraq, which included the serological tests of both man and animals, as well as isolating, compensating and slaughtering the positive animals.

We highlighted one great infected area, which supplies the Sulaimany city centre continuously with dairy products, particularly yogurt. We also demonstrated that human brucellosis in the area is closely linked to the animal infection, social habits , and food .

It is worthy to clarify that the above results were obtained only from the suspected, human and animal samples. There fore a higher incidence could be expected if the whole farmers and animals were screened in the study . So brucellosic still remains as an endemic disease and a major health problem in the area, unless the whole productive animals are included in a proper wide screened serological survey, and then the slaughtering of any positive reactors when tested It is also important to vaccinate young animals (3-6) months calves, 4-6 months lambs and kids), pasteurize milk and dairy products for human consumption, hygienic measures should be taken regarding the use of protective clothing when handling infected animals. It is also necessary to collaborate with medical health authorities and educate

the farmers to report all suspected cases to the veterinary authorities in the area.

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Table 1 Brucella agglutining among humans, goats,sheep and cattle in Karadach- Sulaimany.

	No. of tested sera by card test	No. of positive & %	No. of tested sera by tube agglutination	No. of positive & %
Humans	215	118 54.8%	118	85 39.53%
Goats	1610	444 27.5%	444	319 19.8%
Sheep	302	74 24.5%	74	53 17.5%
Cattle	4	2 50%	2	2 50%

Table 2 Animals in Karadach- Sulaimany.

	Goats	Sheep	cattle
	13200	5500	1650
Tested animals %	12.19	5.49	0.24
Positive results by card test %	3.36	1.34	0.12
Positive result by tube agglutination test %	2.41	0.96	0.12

Table 3 The sequences of positive animals.

	Slaughtered animals			Death
Total positives	in abattoir	by the owner	elsewhere	
520	269	48	171	32

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دەرکەوتنی دژەتەنی نەخۆشی بروسیلا لە نێوان مرۆڤ و بزن و مەڕ لە ناوچەی قەرەداغی سلێمانی

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کورتە

لەم توێژینەوە سەرەتایەدا بە دەرخستنی دژەتەنی نەخۆشی بروسیلا (تای مالتا) لەنێوان ئاژەل و خاوەنەکانیدا ، ٢١٣١ نمونەی سیرەم کۆکرایەوە لە ٦٢ گوندی ناوچەی قەرەداغ لە ماوەی ٦ مانگدا . سیرەمەکان لە پێشدا لە سەر کارت پشکنینی بۆ کراو لە دوایدا بۆ زیاتر سەلماندن لە ناو بۆری تاقیکردنەوەدا . ئەو مرۆڤانەی کە دژەتەن دەرکەوت تیایاندا بە هۆی هەردوو جۆری پشکنین کە باسکران لە سەرەوە یەك لە دوای یەك بەم جۆرە بوون ١١٨ (٥٤,٨٪) و ٨٥ (٣٩,٥٣٪) ، لە ئاژەلیشدا بە هەمان پشکنینی سەرەوە بەم جۆرە دەرکەوت ٥٢٠ (٢٧,١٣٥) و ٣٧٤ (١٩,٥١٪) . ئەم توێژینەوەیە دەری خست کە پەیوەندی هەیە لە نێوان ژمارەی توشبوان و دوورونزیکی ناوچەکە لە شار هەروەها لە گەل تەمەن زۆری و کە یانووی مال و منالە نێرینەکانی لادێ . لەگەل ئەمانەشدا دەرکەوت کە پەیوەندی هەیە لە نێوان بلاوبونەوەی ئەم نەخۆشییە و گوزەرانی کۆمەلایەتی ، هەروەها لە گەل جۆری کار و خواردەمەنی کۆمەلگا .

بەپێی زانیاری ئێمە ئەمە یەکەمین توێژینەوەیە کە لەم بابەتە ئەنجام درابێت ، لە ناوچەی سلێمانی و عێراق دا ، چونکە یەکەمین جارە توێژینەوەیەکی فراوانی هەمەلایەن ، لە ناوچەیەکی گوندنشینی گەورەدا بۆ نەخۆشی بروسیلا ئەنجام درابێت ، سەرەڕای ئەمەش دەست نیشانی مرۆڤە نەخۆشەکان کراو ئاژەلە گومان لێکراوەکان جیاکرانەوە و تووش بووەکان سەربڕران دوای بەخشینی قەربو بە خاوەنەکانیان . بێجگە لەمانەش مرۆڤە نەخۆشەکان چاودێری کران و بە خۆڕایی چارەسەرکران . لەم توێژینەوەیەدا ئەوە دەرخرا کە زۆر پێویستە گرنگی بدرێت بە لەناوبردنی نەخۆشی بروسیلا . کە نەخۆشیەکی دژوارە بۆ تەندروستی گشتی و ئابووری وولات ، هەروەها پێشنیار کرا پلانی گونجاو دابنرێت بۆ کونترۆل و قەلاچۆکردنی ئەم نەخۆشییە لە مرۆڤ و ئاژەلدا لەگەل پەرەپێدانی توێژینەوەی زیاتر لەم بارەیەوە .

انتشار أجسام التلازن المضادة لداء البروسيلا بين الانسان والماعز والاغنام في منطقة قرداغ – السليمانية

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الخلاصة

تم فحص ٢١٣١ عينات مصلية ضمن دراسة اولية حول انتشار الاجسام المضادة لداء البروسيلا (حمى مالطا) بين حيوانات واصحابها في ٦٢ قرية تابعة لمنطقة قرداغ، خلال فترة ٦ اشهر. استعمل فحص التلازن على البطاقة في البداية ثم فحص التلازن في الانبوب للتأكد من النتائج. كانت النتائج الموجبة للاشخاص ١١٨ (٥٤,٨ %) و ٨٥ (٣٩,٥٣%) في فحص التلازن على البطاقة و في فحص التلازن في الانبوب على التوالي. وفي الحيوانات ظهرت ٥٢٠ (٢٧,١٣ %) و ٣٧٤ (١٩,١٥%) حالة موجبة في الفحصين المذكورين أعلاه على التوالي. أظهرت الدراسة وجود علاقة بين عدد حالات الموجبة من جهة وبين بعد المنطقة من الحضر وتقدم في العمر والعاملات من الاناث وكذلك ذكور الاطفال في الريف من جهة اخرى. لقد تبين وجود علاقة بين انتشار المرضى والحالة الاجتماعية، كذلك نوع العمل والغذاء في المجتمع.
ان الدراسة المقدمة هي الاول من نوعها في منطقة السليمانية وفي العراق حسب معلوماتنا، حيث اجريت ولاول مرة دراسة شاملة حول داء البروسيلا في منطقة نائية وواسعة، وقد تمت تشخيص الحالات الموجبة في الاشخاص والحيوانات مع عزل وتعويض وذبح الحيوانات المثتبة، اضافة الى متابعة الحالات المثتبة في الاشخاص وتقديم علاج مجاني لهم. وقد ابرزت في هذه الدراسة ضرورة الالتفاف لمكافحة هذا المرض الخطير على الصحة العامة والاقتصاد الوطني اضافة الى اقتراح وضع خطة مناسبة للسيطرة ومكافحة المرض في الانسان والحيوانات مع اجراء مزيد من الدراسات الميدانية.