Serological Study About human Brucellosis in Tikrit City

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Abstract:

The prevalence of brucellosis and some important risk factors of brucellosis determine in this study. This study was carried out on (188) patients with fever attending Tikrit Teaching Hospital (TTH) and Primary Health Care Center (PHCC), in Tikrit city, were investigated by direct interview with them history of disease, then examined clinically and serologically .
Out of 188 cases with fever 28 (13%) case had brucellosis. Most of the patients 24(85.7%) were females from rural area (75%), at the age group between 30 – 39 years (54.1%) who were housewives and farmers since they represent and (45.8%) of cases respectively .
Most patients were suffering from fever, headache, and joint pain or arthralagia (89.2%, 89.2%, and 78.5% respectively). The serological test was Rose Bengal Agglutination Test (RBAT).

Key Words : Brucellosis, Malta fever, Undulant fever .

Introduction:

Brucellosis is a zoonotic infection transmitted from animals to humans by ingestion of infected food products, direct contact with an infected animals, or inhalation of aerosols. The last method of transmission is remarkably efficient given the relatively low concentration of organisms (as few as 10 – 100 bacteria) needed to establish infection in human and has brought renewed attention to this old disease [(1)]. Brucellosis, also known as undulant fever or Mediterranean fever. Brucellosis is common in Eastern, Europe and the Mediterranean, South and Central America, parts of Mexico, India, Africa and the Caribbean . Brucellosis is still endemic in developing areas of the world [(2,3)]. This disease is caused by *Brucella* bacteria by contact with animal or animal products such as milk, cheese and others which carrying this bacteria . David Bruce isolated this organism that bears his name from the spleens of five patients with fatal cases on Malta [(1,4)].

Currently, of the six main species of *Brucella* , four have significant human pathogenicity. *Brucella abortus* (from cattle), *Brucella melitensis* (from sheep), *Brucella suis* (from pigs), and *Brucella canis* (from dogs) [(5,6)]. *Brucellae* are aerobic gram negative, coccobacilli which can enter into human through breaks in the skin, mucus membrane, conjunctiva, respiratory and gastrointestinal tracts, while sexual transmission is not documented. Both polymorph nuclear leukocytes and macrophages ingest *Brucellae*, but the organism can prevent fusion of phagosome and lysosome . *Brucellae* are transported into lymphatic system and may replicate locally and can replicate in the kidney, liver, spleen, breast tissue, and joints [(1)]. The authors pointed out that changes of *Brucella* species played a decisive role in changing the epidemiological patterns [(7).]

Human Brucellosis is a multisystemic diseases that may present with a broad spectrum of clinical manifestations [(8)]. *Brucella* can present initially with its haematological findings including anemia, leucopenia and thrombocytopenia may mimic primary haematological diseases [(9)]. Endocarditis is a rare but serious complication of Brucellosis, Akinici –E et al, mentioned that the case of *Brucella abortus* endocarditis occurring on a prosthetic mitral valve [(10)].

Materials And Methods:

This study was carried out on (188) patients with fever, attending Tikrit Teaching Hospital (TTH) and Primary Health Care Center (PHCC), from first July 2004 to the end of November 2004 . All patients were interviewed face to face and the clinical diagnosis was made on the basis of history , physical examination .Questionnaires were prepared included all

the parameters to be studied, while the serological investigation including Rose Bengal test .

Two milliliter (ml) of venous blood for serum sample was collected from each patient, which then examined Rose Bengal Agglutination test by using Rose Bengal antigen manufactured by LINEAR Chemicals com.-Barcelona (Spine). The procedure used was described by the manufacturer [11].

Results:

Out of the 188 patient with fever, 28 (13%) cases had Brucellosis (figure 1).

Figure (2) shows the main presentations of brucellosis . Most of the patients 25 (89.2%) have fever and headache , while arthralagia or joint pain was present in 22 (78.5%) cases .

The age and sex distribution of the patients with brucellosis was shown in table (1). The majority of cases (54.1%) were females between 30 and 39 years, while the most of the male patients (50%) were between 20 and 29 years .

Table (2) shows the distribution of the patients with brucellosis according to the residence and sex, 75% of females with brucellosis live in rural areas , while 25% of them were urban. But the percentage of the male patients were equal (50%) in both rural and urban areas .

Thirteen (54.1%) of females patients with brucellosis were housewives and 11 (45.8%) were farmers , while 3 (75%) of male patients with brucellosis were farmers (table 3) .

Rose –Bengal Agglutination Test showed that (67.8%) 0f the patients with brucellosis have antibody titer of 1 : 160, while (28.5%) have 1:320 , and only (3.5%) have the antibody titer 1: 80.

Discussion:

Brucella is one of the world's major zoonotic pathogens and is responsible for enormous economic losses as well as considerable human morbidity in endemic areas [12]. Brucellae are intracellular parasites that infect a wide varity of domestic and free living animals and may be transmitted to human [13,14] .

In the present study the prevalence of brucellosis was 28 (13%) cases from 188 patients with fever, this result is agreed with study was done by Awat N.H. [15], who reported 29% of cases with pyrexia of unknown origin (PUO). Also its corresponding with other studies performed in Iraq [16,17,18], which mentioned the percentage of brucellosis in Iraq is about (10 – 34 %), a higher incidence of the disease was noticed in the north than southern parts .

In Jordan, incidence of brucellosis was calculated per 100 000 population. The lowest incidence of brucellosis was (16.7%) this was detected in year 1988, whereas the highest was (29.9%) and this was observed in 1991 . Evidence is provided which indicates that notified cases of human brucellosis in Jordan do not reflect the actual frequency but rather underestimate the extent of infection [19].

Gerald E. Maloney et al, reported that the certain symptoms were noted to be more prevalent, about half of the people infected develop symptoms 2 – 3 weeks after infection [1]. The symptoms are non specific and resembling flu- like illness e.g. weakness, fever, sweating, headache, and joint pain. Fever was observed in 90% - 95% of patients, malaise in 80 – 95%, myalgias in 40 – 70%, sweating in 40 – 90%, and arthralagias in 20 – 40%. Except the fever and malaise, most symptoms were observed in half of the patients .

In the present study fever and headache were the most common clinical features, noticed in 25 (89.2 %) cases, followed by arthralagia or joint pain and back pain 22 (78.5 %) , while nausea and vomiting were 7 (24.9 %) .

Generally no specific age prediction exists because of limited chance for exposure, although brucellosis is unusual in very young or elderly patients, also no specific gender preference in US [1]. Abu – Shaqra Q.M [19] mentioned that, in Jordan, brucellosis was found to be lowest in children below 4 year and highest in the 5 – 14 years age group.

In Iraq, the incidence of the brucellosis was found to be low in age group below 5 years and maximum in the age group between 45 – 64 years and the females were more affected than males [20] .

In another studies, showed in Iraq, the main age group affected were below 50 year in (79%) of cases and the females were more affected than males [21] .

The present study reported that brucellosis were most common in age group between 30 – 39 years and females were more affected 13 (54.1%) and age group between 20 – 27 years among females which comprised 2 (50%) cases. This result agree with Awat N.H. [15] study who mentioned that the most affected age group with brucellosis is 21 – 30 years and the females from the majority of patients (31.19%) .This may be attributed to handling or dealing with infected sources like milk, milk products and meat as well as house animals .

Regarding residence, 75% of females with brucellosis were from rural area (table 2), while 25% of them were from urban area. This is agreed with Awat N.H. [15], who found that 55.17% of patients with brucellosis live in the rural area. This might be due to low level of hygienic condition and poor water supply and sanitation, also inadequate sterilization procedures for water and milk in rural region and due to contact with animals . From significant risk factors for brucellosis related to occupation as farmer, shepherd or microbiologist and drinking fresh milk and laban which had significant results in Yemen [13], so that the control and prevention could be done through education of the population to minimize exposure to, and contact with animals and milk products also by animal vaccination [13] . In Saudi Arabia, the problem of nosocomial brucellosis persist because of the large number of infected specimens handled by the laboratory (17, 500 specimens per year), so that the risk reduction depends on efforts to reduce disease endemicity in this country [14].

In this study, most of the females patients with brucellosis were housewives (54.1%), while (45.8%) of the same group were farmers . The highest incidence of brucellosis among females in our study may be attributed to that females housewives and farmers were with high contact with animals and animal products .

Also, Elbers -AR, et al [22], reported that the titer of antibodies against Brucella abortus in veterinarians (4.5%) was significantly higher than in pig farmers (0%) .

Antibody testing is the most reliable method for diagnosing brucellosis and the best test is the tube agglutination method, which test for anti –O polysaccharides antibody . Titers of (1 : 160) or higher are diagnostic [1].

Regarding serological tests which was used in this study as Rose Bengal Agglutination Test, 67.8% of patients with brucellosis had the antibody titer of (1:160), while 28.5% of the cases with (1:320) of antibody titer .

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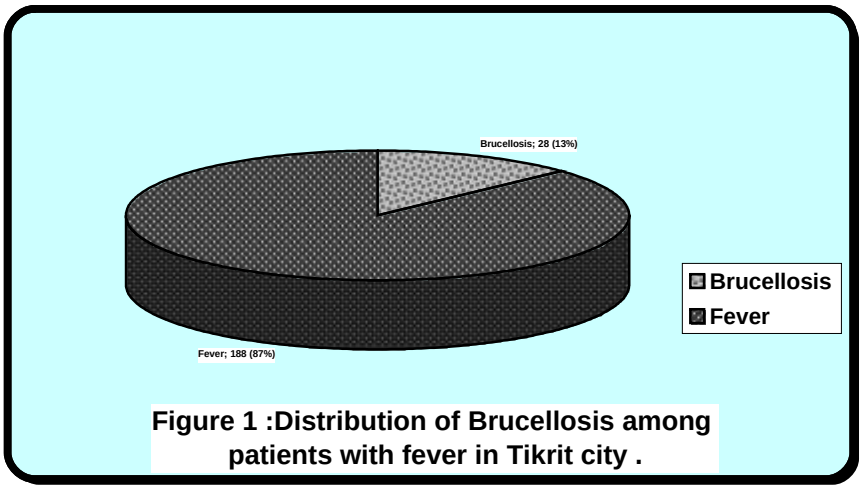

Figure 1 :Distribution of Brucellosis among patients with fever in Tikrit city .

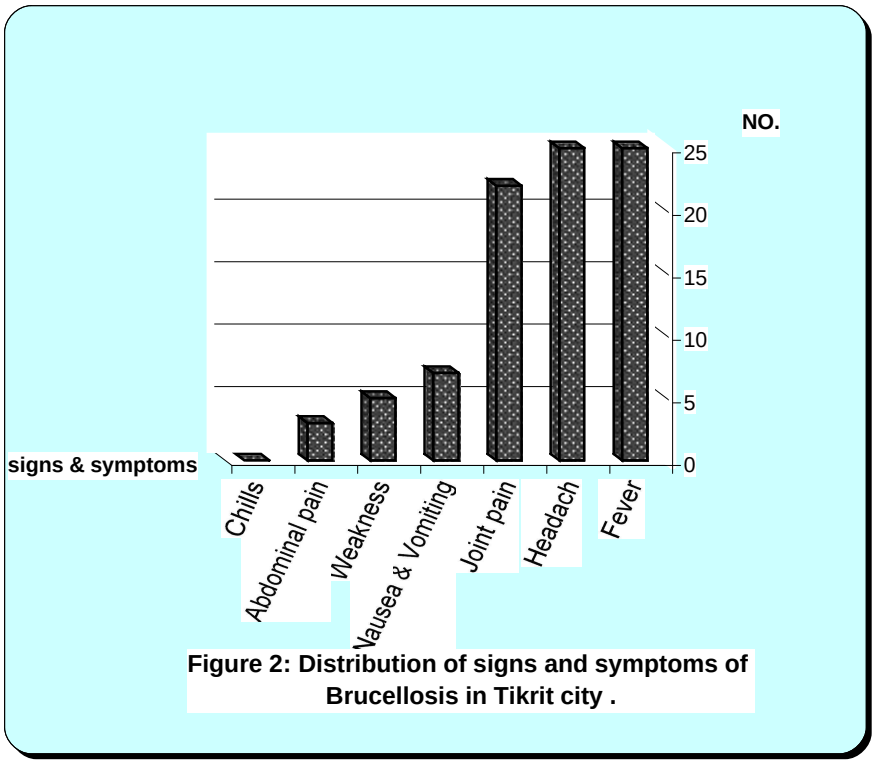

Figure 2: Distribution of signs and symptoms of Brucellosis in Tikrit city .

Table 1 : Distribution of Brucellosis according to age and gender.

Sex	Female		Male		Total	
Age "yr"	NO.	%	NO.	%	NO.	%
10 – 19	0	0	1	25	1	3.5
20 – 29	1	4.16	2	50	3	10.7
30 – 39	13	54.1	1	25	14	50
40 – 49	6	25	0	0	6	21.4
50 – 59	4	16.6	0	0	4	14.2
Total	24		4		28	

Table 2 : Distribution of Brucellosis according to residence.

Brucellosis	Female		Male		Total	
	NO.	%	NO.	%	NO.	%
Urban	6	25	2	50	8	28.5
Rural	18	75	2	50	20	71.4
Total	24		4		28	

Table 3 : Distribution of patients with Brucellosis according to occupation.

Occupation	Female		Male		Total	
	NO.	%	NO.	%	NO.	%
Farmer	11	45.8	3	75	14	50
Housewife	13	54.1	0	0	13	46.4
Pupil	0	0	1	25	1	3.5
Total	24		4		28	

Table 4: Antibody titer among patients with Brucellosis.

Antibody titer	NO. +ve	Brucellosis %
1: 80	1	3.5
1: 160	19	67.8
1: 320	8	28.5
Total	28	