

Presentation of brucellosis in an endemic area; west of IRAQ

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ABSTRACT

Background: brucellosis in enzootic bacterial infection of animals and human through infected animals milk, urine, vaginal secretions, uterine products & uncooked infected meat. leads to clinical human infection with brucellosis.

Objectives: this study was introduced to look for endemicity, presentation & rate of infection of brucellosis in Anbar Governorate West of Iraq.

Materials & methods: one hundred four (104) patients had clinical features of brucellosis investigated serologically, blood cultures. received antibrucella of triple antibiotics for minimum 6 weeks followed up regularly till they cured, during the period from 30.12.2009 to 30.12.2010.

Results: one hundred four (104) cases were diagnosed, fifty four of them (54) were females and fifty (50) were males all of them were adults. Ninety six (96) cases were presented with subacute *brucellosis*, three (3) cases with knee joint arthritis, (four) 4 cases with sciatic nerve radiculopathy and one case of neurobrucellosis.

Conclusion: the study proved that Anbar Governorate is endemic with *brucella* infection with mild symptoms in most cases and good response with no relapse rate with triple antibrucella antibiotics.

Keywords: Brucellosis, Zoonosis, Endemicity

INTRODUCTION

Brucella is Gram negative bacteria (bacilli) it is intracellular bacteria especially in the reticuloendothelial system so it has the ability for chronicity and relapse (1,2,3). it is enzootic, infect animals (cattle, sheep, goats, equines, swine & camels). It is secreted through the animals milk, uterine secretions, vaginal secretion, urine & faeces other animals can get infection through consumption of these products or infected meat e.g. dogs which will be other source to infect human and increase endemicity of brucellae in the area. human infected by consuming infected unpasteurized milk, cheese, yogurt & butter or consuming uncooked meat. human get infection also through wounds or skin abrasions as contaminated e.g. in animal laboring not wearing gloves or carrying infected animal placenta by

human hands and the bacteria enter to human through the wounds or abrasions (1,2,3, 4).

A serological surveillance was done and revealed the prevalence of the disease in sheep, goats, cattle, buffalo and camels was 6.51 %, 1 %, 1.84 % and 0.02% respectively in IRAQ Except Kurdistan governorate. In spite of the lack of appropriate recording in the middle and south of Iraq, the incidence rate of brucellosis in human after the 2003 war was 5347 recorded cases representing 22.7 cases/100,000 people, (5).

There are six species of *brucellae*, four of them are important for human. *Br. melitensis* (infects sheep, goats & camels), *Br. abortus* (infects cattle), *Br. canis* (infects dogs), *Br. suis* (infects swine) (2).

Brucellosis in human can be presented as an acute infection, subacute or chronic infection. It may be presented as localized organ infection. In Acute presentation, the patient complaining of intermittent fever, profuse sweating, headache, arthralgia, rigor, splenomegaly which may lead to hypersplenism and any localized organ involvement if the diagnosis & treatment delayed which may infect musculoskeletal system central nervous system, ocular, cardiac, respiratory, abdominal, genitourinary systems & hematological system (1,3).

Brucella diagnosis is definitely by isolation of bacteria by blood culture, but isolation method carry risk of infection to the laboratory workers (Br. mellitensis 75-80 %. Br. abortus 50%) (6,7).

Rose- Bengal test, which is serological test by slide method (antigen antibody test) is positive in infected patients in 95% of acute infection it needs several weeks to become positive & remains positive after cure of the patient for many years. It has the character of prozone phenomenon which is false negative result of Rose Bengal test due to concentrated serum, with dilution of test serum the result becomes positive. In endemic area the titer of 1/320 or four rise in the fold of titer is considered positive. In high endemic area. Rose- Bengal test is considered screening test.

Prove of the previous or new infection is by 2-mercaptoethanol test, positive indicate recent infection (6,7). Tube agglutination test is more diagnostic yield for *brucellosis* (7). In localized infection e.g. brucella arthritis in addition to above investigations, radiological study like X- ray study, aspiration of synovial fluid with bacteriological culture.

Neurobrucellosis is diagnosed in addition to above investigations by MRI of the brain & CSF study for Rose-Bengal study & CSF culture (1,3,8).

Brucella is treated by doxycycline capsules 100 mg 12 hourly for 6 weeks.

Rifampicine capsules 600 mg -900 mg for 6 weeks .Streptomycin vial for first two weeks 750 mg for patient less than 50 kg\BWT and 1gm for patients more than 50 kg\BWT, multidrug regimen carry good response result and low relapse rate e.g. doxycycline+rifampicine has relapse rate of 5%, doxycycline+streptomycin is another regimen (1,3,9,10).

MATERIALS AND METHODS

The study done over one year from 30-12-2009 to 30-12-2010, one hundred (104) adult patients were presented with brucellosis.

Full history was taken, well clinically examined, investigated laboratory by Rose-Bengal test with dilution method, 2ME test, tube agglutination test following (Hudson and Hay 2000)¹¹.

Blood culture was done on Castaneda medium by inoculation of 3ml of patient blood following guidelines of (Vadepitte *et al.* 2003.)¹³. Bacterial isolates were identified by direct Gram stain and biochemical tests following (Washington 2005)⁶. Patients received triple therapy antibiotics of doxycycline 100 mg twice daily, rifampicine 600 mg daily for six weeks & early use of streptomycin vial for 2 weeks there was good response for this regimen. Patients followed up for 6 weeks till complete cure & followed up regularly for relapse which was negative for all my patients. Six (6) months treatment for the patient with neurobrucellosis with good outcome was documented clinically with MRI study follow up with blood culture and serological study.

RESULTS

One hundred four (104) cases of adult patients of brucellosis over one year had been diagnosed all of them from different towns of Anbar Governorate, fifty four (54) of them were females and

fifty (50) were males. Most of the cases 95% were from rural areas and most of these patients rear animals cattle, sheep & goats beside their houses in their farms, the patients were advised to examine their animals by veterinarian doctors and 90% of them gave history of their animals infection with brucella.

Five (5%) of patients were from urban areas. Most of the cases were young patients between the age of 20 -30 years (39 cases) & lowest rate of infection was between 61-70 years (9 cases) (Table 1, Table 2).

Table1: Age groups and patient number

Age	Number of patients	
20-30	39	37.5 %
31-40	17	16.4 %
41-50	20	19.23%
51-60	19	18.3%
61-70	9	8.6%
Total	104	100 %

Table 2 sex related to number of patients.

Sex	Number of patients	
Male	50	48.0 %
female	54	52 %

There was seasonal variation in the incidence of brucellosis over the year, most of the cases are within spring

season (during the period from March to May) & lowest cases within winter (From October to February) (Fig.1).

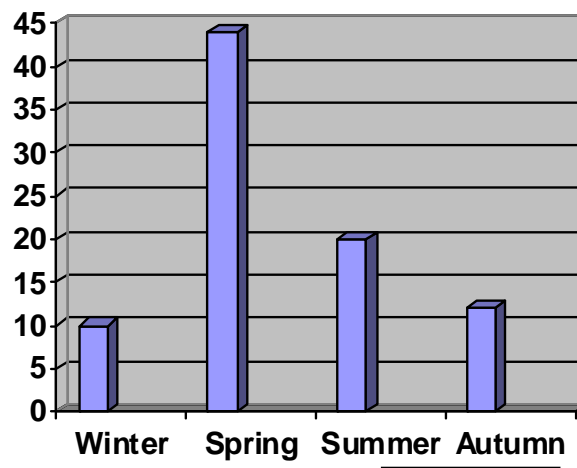


Fig. 1: Seasonal variation of Brucellosis

DISCUSSION

The patients whom diagnosed with brucellosis were adults this was ought to the sampling method, we are dealing with adults patients in our private clinic and other sites from where cases were collected. The number of patients was 104 patients most of them from rural

areas when advised to examine their animals for Brucellosis to prove animal infection. Previous studies in Al-Anbar governorate in 1994 and 2006 (AlAzawi and Lafi 1994¹³, Al-Ouqayli 2006¹⁴) as well as the study of Salih 2010⁵) on the epidemiology of brucellosis in IRAQ, all the studies

proved that humans were infected with brucellosis so that the area of study (West of Iraq) is still endemic with human zoonotic brucellosis and this was due to unapplied system of test and slaughter for animal infection eradication as in Europe and other advanced countries. Infected animals must be eradicated by slaughtering and burning of the infected animals because there is no curable medical therapy for brucellosis in animals (Source of human infections), the animals in this area (west of Iraq) are expensive so the farmers refused strongly to slaughter their infected animals and burning them so the infection persist and transmit infection to their children by breast feeding and other animals whom consume their infected milk on other hand this infected milk if consumed unpasteurized by human it leads to human infection so the area will be endemic with brucellosis both to animals and human. non significant difference was found between males and females while in other countries which are endemic with brucellosis (9,15,16,17).

So as in Egypt(18), Sudan(19) and Ethiopia (20) the females were more in number than males whom get infection and most of the infected patients were young to middle age, because both sexes are working in the farm and take care of their animals. Females looks after animals more than males so they get infection relatively more than males.

Our explanation for age and sex variation in the rate of infection in the area of the study was ought to the fact that in Iraq all family individuals are working in the farm and care of the animals young and middle age e.g. laboring animals by themselves without protecting themselves, not examining animals for *Brucella* infection, milking animals, drinking raw infected milk immediately, leads to infection with *Brucella* old age less contact with animals they get infection through consuming unpasteurized milk and its

production. We found 5 % of cases were among urban patients while (Yacoub *et al.* 2006²¹) were found that the prevalence of brucellosis was higher in the suburban semirural area (29.3%) than the rural and urban areas of Basra region and this was disagree with that reported by (Al Azawi and Lafi 1994¹³) in Al-Anbar governorate.

Seasonal variation was found for presentation of brucellosis, higher rate of infection was found in spring, this was in accordance with (Al-Azawi and Lafi 1994¹³ Salih 2010⁵). This was ought to the animal reproduction increase and milk production increase in this season in Anbar Governorate and other sites of IRAQ in addition to that the organism can sustain environmental conditions (temperature, PH, moisture etc.) in this season more than other seasons of the year (European Commission 2001²²). The presentation of most of the cases was mild due to high endemicity and exposure of brucellosis so increase the body immunity (1, 2). The most of bacteria which isolated were *Brucella abortus* which is usually has mild presentation of symptoms (2, 6).

There was only one case of neurobrucellosis. it is very rare world wide (7) and this is the first case registered in this area. the case was female from urban area, lately diagnosed and treated.

The cases presented with oligoarthritis (both knee joints) diagnosed by synovial fluid aspiration with bacteriological culture which prove *B. abortus* which is common bacteria in Anbar Governorate. *Brucella* bacteria has the tendency to involve the locomotor system especially the large joints.

Neuritis & neuropathy are another common presentation of acute, subacute & chronic brucellosis as with my study three cases of sciatic radiculopathy was presented which show low percent of localized organ involvement due to good immunity of patients and low virulence

of bacteria and good awareness of patients to symptoms looking care for themselves for treatment earlier.

Splenomegaly occur as part of reticuloendothelial system involvement .it occurs in 30% in brucellosis cases (1) but in this study the percent of presentation of splenomegaly is much less (1.04%) due to endemicity and high exposure rate which affect immunity of the patients and affect presentation of the cases and due to bacteriological factors and patients factors due to early diagnosis and treatment of the patients where they look for medical advice early in the disease.

The cases respond very good to triple antibrucella antibiotics early 2 weeks of streptomycin vial with doxycycline capsules 100mg twice daily & rifampicine capsules 600mg-900mg daily for 6 weeks all cases cured no relapse of brucellosis in follow up of the cases with negligible side effects .this in comparison with study of dual therapy treatment of brucellosis (streptomycin or gentamycine plus doxycycline capsules) showed good response clinically but with relapse rate of 5-10 % (8). So that triple therapy is curative no relapse rate due to good penetration to infected organs and eradication of bacteria and this was in agreement with the findings of (Al-Ani 1990)²³.

We can conclude from this study that Anbar Governorate is considered as one of the endemic areas with brucellosis this needs surveillance and follow up through brucella center for diagnosis, treatment, prevention & education. AS well as activation of veterinary branch as well as activation and follow up of vaccination campaign through program supervised by FAO and SCVS (OSR0/IRQ/406/UDG,) Restoration and Development of Veterinary Services in Iraq.

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ARABIC SUMMARY

عرض لجرثومة حمى مالطة في الاماكن المتوطنة بغرب العراق.

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جرثومة حمى مالطة من الجراثيم التي تصيب الحيوانات مثل الأبقار الأغنام الماعز الكلاب والخنزير وتصيب الإنسان عن طريق استخدام حليب الحيوانات المصابة وغير المبستر أو عن طريق منتجات الحليب غير المبسترة مثل الأجبان والألبان والقيمر، الزبد وان يصاب الإنسان عن طريق تناول اللحوم الحيوانات المصابة بجرثومة حمى مالطة غير معقمة أجريت هذه الدراسة لمدة سنة من تاريخ ٢٠٠٩\٧\٣٠ إلى ٢٠١٠\٧\٣٠ وعلى ١٠٤ مرضى من البالغين المصابين بمرض حمى مالطة لتظهر مدى وبائية المرض في الإنسان والحيوانات في منطقة غرب العراق (محافظة الانبار) شملت هذه الدراسة على تشخيص المرض لدى المرضى الذين يعانون من الأعراض السريرية لحمى مالطة عن طريق الفحوصات المختبرية المتنوعة وإعطائهم العلاجات المضادة لمرض حمى مالطة ومتابعتهم سريريا ومختبريا على مدى ستة أسابيع من العلاج وأظهرت الدراسة ان محافظة الأنبار موبوءة بمرض حمى مالطة لدى الإنسان والحيوانات.