Demographic characteristics and Wright test titers in patients treated for brucellosis

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Abstract

Introduction:
Iran is one of the endemic countries of brucellosis with a prevalence of about 225 in 1000000 population. In this study, there was an attempt to evaluate the demographic characteristics and Wright test titers in treated patients previously diagnosed with brucellosis.

Material and Methods:
In this descriptive cross-sectional study, 168 patients under treatment for brucellosis were evaluated during the years 2005 and 2008.

Results:
The mean age of the studied patients was 28.51 ± 17.07 years and most of them were in 10-29 year old age group. 68.5% of the patients were male and 31.5% female. Most of the patients (60.1%) were shepherds; and their Wright titer was 1/320 in 33.1% of the cases.

Conclusion:
Shepherds and those with 10–29 years of age are the high risk groups for brucellosis, so more attention should be paid in them. Males are more at risk than females. It is recommended that the serum of the patients be diluted up to 1/320 in standard tube agglutination test.

Keywords: Brucellosis, Demographic Factors, Serology

Introduction:
Brucellosis is a zoonotic disease and a public health problem all over the world. Although eradicated in most European countries it is still prevalent in Mediterranean countries, Arabian Peninsula, Indian subcontinent, and South and Central America (1-3). It is still one of major causes of long term chronic febrile diseases in several countries (4). Prevalence of brucellosis in Iran like other developing countries is increasing day by day and Iran is deemed a brucellosis-endemic country. Prevalence of brucellosis in Iran is thought to be about 225 in 100000 people (5 and 6). Brucellosis affects various organs of human body and causes diverse signs and symptoms which hinder diagnosis and diagnosis usually requires several laboratory tests (7). The best brucellosis diagnostic test is isolation of bacteria from blood or other clinical samples. Indeed isolation of
bacteria is the gold standard test for brucellosis diagnosis. Sensitivity of this method is based on the stage of the disease and some other factors. Brucella needs at least three weeks to grow in the culture thus it is not a swift diagnostic method for brucellosis and administration of other techniques especially serologic methods are suitable for early diagnosis and treatment of brucellosis to prevent disability, morbidity and mortality (8 and 3).

Rose Bengal test is one of the methods utilized as a serologic test for brucellosis screening but regarding high false positive results of that test due to different reasons, Wright agglutination standard tube test is used for diagnosis (9-13).

Wright test as an inexpensive and quick method has been used for brucellosis diagnosis for more than 100 years. This method has high sensitivity but low specificity. Titers higher than 1/160 are considered positive results but due to high prevalence of brucellosis in Iran, high risk individuals with titers more than 1/80 are deemed positive (6).

The aim of this study was to evaluate demographic characteristics of patients with brucellosis and their Wright test titer at first visit in Jahrom Disease Control Center. This study could be considered as a pilot study for further investigations on brucellosis.

Material and Methods:
This study is a cross sectional descriptive study and was performed on medical records of 168 patients with diagnosis of brucellosis who were referred to Jahrom Disease Control Center. The patients were referred to this center by various physicians in Jahrom City. Wright titers more than 1/80 had been regarded positive. Some patients had presented with fever, headache, low back pain and lower limb pain. Sampling was done by consecutive simple method. All patients with brucellosis who were under treatment between October 2005 and October 2008 were involved in the study. We collected information about demographic characteristics and Wright test titers. Inclusion criteria were patients with diagnosed brucellosis and under treatment and exclusion criteria were lack of adequate information in medical records and impossibility of data extraction from medical records. Data was analyzed by SPSS software and descriptive statistics tables.

Results:
Totally 168 medical records of patients with brucellosis which had received treatment in Jahrom Health Center were involved in the study. 68.5% of the patients (115 individuals) were male and 31.5% (53 individuals) were female. Minimum age of the patients was 1 year and maximum age was 80 years with mean age of 28.51 ± 17.07. Most of the patients (87 patients, 51.8%) were 10 to 29 years old. 31.3% of men were 10 to 19 years old and 28.3% of women were 40-49 years old which demonstrated that maximum prevalence age in women was higher than men.

Majority of the patients were shepherd (101 ones; 60.1% of all patients) including 71 men (70.3%) and 30 women (29.7%). 1.2% of the patients were butcher (2 ones), 4.8% were farmer (8 ones) and 7.7% were housekeeper (13 ones). The most frequent profession of our patients was shepherds, as 61.2% of men and 56.6% of women were shepherd. Job frequencies in patients of different age groups are depicted in table 1. In that table job of children under the age of 9 years has been considered as “none” and the word “others” refers to the jobs which are not mentioned in the table. As the table illustrates, in individuals with different jobs, the age of maximum prevalence is different. While the age of maximum prevalence in shepherds was 10-
29 years, it was 40-49 years in housekeeper women and 50-59 years in farmers. Antibody titer in one case was 1/51 and 1/80 in 21 cases whereas most individuals (51 cases; 33.1%) had antibody titer of 1/32. Antibody titers of 14 patients were not entered in their medical records. Frequency of patients’ antibody titers are depicted in table 2.

**Discussion:**
The most prevalent age group in patients was the 10-29 year group. In a study in Imam Khomeini and Sina hospitals in Tehran, mean age of the patients was 35.5 years and most of the patients were in their third or fourth decade of life which was almost consistent with results of this study (14). In a study performed in Semnan the most frequent age group of the patients (22.5%) was the 16-25 year group (15) and in a study in Kashan on 380 patients, most of the patients were 20-39 years old (16). Mean age of the patients in similar studies in Iran’s neighbor countries like Saudi Arabia was 33.8 years and 40.2 years in Turkey (17 and 18).

Most of our patients were men (68.5%) which might be due to the point that in our region they are more exposed to livestock. Prevalence of the disease was higher in men rather than women in other studies in Iran. For instance, 52.3% of patients of a study in Tehran and 59% of patients of a study in Kashan were men (14, 16). Similarly in a study conducted in Maneh and Samalghan in North Khoarasan Province, 68.8% of the patients were male. Among 64 patients evaluated during the years 2008 and 2009 in that study, 26 (40%) were shepherds, farmers or livestock farmers and were exposed to livestock (19).

In our study, most of the infected male patients were shepherds but in other studies were of some other professions; as in a study in Kordestan the most frequent group was the housekeeper women (39.4%) and only 5.2% of the patients were shepherds. The reason of high disease prevalence in housekeeper women was told to be their frequent exposure to livestock in that region (20). Whereas in a study in Sistan and Balouchestan Province, housekeeper women had the lowest frequency (4%) and farmers had the highest one (38%) (21). In another study performed in Uzbekistan, 95.1% of the patients were livestock farmers (22). In the same way in a study in Yemen prevalence of brucellosis in livestock farmers was higher than other groups of people (23).

Regarding aforementioned data it seems that prevalence of brucellosis in people with various professions in different societies is different and depends on the culture and social texture of every society. As in south part of Fars Province including Jahrom, most people are nomads and mainly livestock farmers; thus high prevalence of the disease among shepherds is expected.

It seems that controlling the disease in shepherds could reduce the brucellosis prevalence in the country; thus investment on it would be worthwhile.

The most frequent Wright titers of the patients in our study were 1/320, 1/160 and 1/640 respectively. In a study in Kashan the most frequent Wright titer was 1/160 (20.4%) (16). Mansouri and his colleagues reported that 95.3% of patients admitted in Sina Hospital in Kermanshah City with diagnosis of brucellosis had Wright titer of 1/160 (24).
It sounds that late patient referral, late diagnosis by physicians and differences in reading agglutination test by different laboratory staff are major causes of high Wright titers in patients of Jahrom.

However in aforementioned studies gold standard methods were not used for diagnosing brucellosis and their results are not completely reliable. On the other hand there is no specific standard for reading the
Wright test and it totally depends on the staff’s experiences and their visual acuity. In a study performed in North Khoarasan Province, 26.6% of the patients had Wright titer of 1/160. Most of those patients had Wright titers of 1/80 to 1/320 (19).

In a study on children in Kerman, blood culture was considered as the gold standard method for diagnosis. That study revealed that most positive blood cultures were in patients with higher Wright test titers (25). In Konstantinidis and colleagues’ study, sensitivity of Wright test was 90% and its negative predictive value for ruling out brucellosis was 96% (26).

**Conclusion:** Based on results of this study it seems that the most important high risk individuals for brucellosis in Jahrom City are the shepherds and physicians should pay more attention to their symptoms and think of brucellosis as a possible differential diagnosis. On the other hand while individuals aged 10-29 years had the highest disease prevalence, physicians should pay heed to patients in these ages particularly the male ones. Moreover while performing Wright test with the tube method, it is better to dilute patients’ serum up to titer of 1/320; because regarding high prevalence of this titer one could be confident that the prozone phenomenon would not been occurred.

**References:**

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