

## Seroprevalence of Brucellosis in Human Population in the Northwest Region of Iran

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**Abstract:** Brucellosis is a zoonotic disease of worldwide distribution. Despite its control in many countries, it remains endemic in Iran. The aim of this study was to determine the seroprevalence of brucellosis in human population in the northwest of Iran. At this study of all 1450 peripheral blood samples were collected during September 2007 to February 2008 from Tabriz central hospital. Of all samples 15 (1.03%) were positive, of which 9 male cases and 6 female cases were recorded. It seems that the elimination of infected animals is the best way for the elimination of disease in human population in Iran.

**Key words:** Seroprevalence • Brucellosis • Human • Tabriz • Iran

### INTRODUCTION

Brucellosis is an infectious zoonotic disease that is associated with chronic debilitating infections in humans and reproductive failure in domestic animals. The transmission of brucellae from infected animals to humans occurs either by occupational contact or the consumption of contaminated animal products, especially milk, cream, butter and fresh cheese [1]. The disease is characterized by fever, arthralgia, sweating, back pain, malaise and anorexia. It often results in complications and the musculoskeletal system is frequently affected [1]. Iran is an endemic area for brucellosis. Hasanjani Roushan *et al.* [2] studied epidemiological features and clinical manifestations in 469 adult patients with brucellosis in the northern part of Iran. They found that the consumption of fresh cheese (22.4%), animal husbandry (11.3%), working in a laboratory (8.1%) and veterinary profession (1.5%) were the main risk factors for brucellosis infection.

The purpose of this study was to determine the seroprevalence of brucellosis in human population at the northwest region of Iran.

### MATERIALS AND METHODS

At this study, 1450 peripheral blood samples of patients referred to the Tabriz Central Hospital were collected during September 2007 to February 2008. Serum samples were analyzed in three phase. In the first phase, all specimens were screened by the Wright test. A titer of 1:80 or greater was considered to represent the presence of specific agglutination brucella antibodies (seropositive). In the second phase, seropositive specimens were analyzed by comb's test. A titer of 1:160 or greater was taken as index of seropositivity. In the third phase, samples were investigated by 2-mercapthoethanol test [3].

### RESULTS

Of all 1450 samples, 15(1.03%) were positive for Wright test (Table 1). Distribution of 15 seropositive cases by Wright test was 9(%) males and 6(%) females. For 15 seropositive patients, Coombs Wright and 2Mercapto-Etahanol test were applied (Table 2). Three patients (2 males, 1 female) were hospitalized in the Hospital.

Table 1: The results of Wright test

Test	Positive	Negative	Total	Prevalence rate (%)
Wright Test (>1:80)	15	1435	1450	1.03

Table 2: Confirmed tests on seropositive patients

Test	Positive	Negative	Total	Prevalence rate (%)
Coombs Wright	15	0	15	100
2Mercapto-Ethanol test	15	0	15	100

## DISCUSSION

Brucellosis occurs in domestic animals, especially in food animals and is transmitted to human by direct and indirect contacts such as consumption of contaminated milk and dairy products, close contact with infected animals, their tissues or secretions and others. In brucellosis IgM, IgG, IgA and small amount of IgE immunoglobulin will be secreted in serum when human immunity is stimulated [4].

At this cross-sectional study of all 1450 samples, 15(1.03%) were positive for Wright test. Distribution of 15 seropositive cases by Wright test was 9(%) males and 6(%) females. The reason for lower result in Tabriz than those in other regions of Iran might be the fact that the other studies were probably conducted in regions whereas raising livestock for commercial purpose was widespread and the target population was farmers, who continuously contact with animals which can be infected.

Seroprevalence were not available for most region of Iran, but Hajia *et al.* [5] showed the prevalence rate of brucellosis is 3.28% in Hamedan, western Iran. Bokaei *et al.* [6] studied the prevalence rate of brucellosis in Birjand during 2002 to 2006 and it was 37/100000 in human.

Worldwide, reported incidence of human brucellosis in endemic disease areas varies widely, from <0.01 to >200 per 100,000 population [1].

In Saudi Arabia, the seroprevalence of brucellosis was 15%. Data from developing countries in the Mediterranean basin, particularly the Middle East, reported seroprevalence rates ranging from 8% in Jordan to 12% in Lebanon and Kuwait [7].

In southeast Turkey (Diyarbakir), 20663 samples were collected and 2.2% was positive for brucellosis [8]. In Kayseri, central Anatolia and Kirikkale, Turkey the prevalence of brucellosis were 3.4 and 3.2%, respectively [9,10].

It seems that the only effective way to control of disease in man is by elimination of the infected animals and vaccination of healthy ones in order to reduce the risk of those in regular contact with animals and to reach brucellosis free animal products.

## REFERENCES

1. Young, E.J., 2000. Brucella species. In: Principles and practice of infectious diseases, Eds., G.I. Mandell, J.E. Bennet and R. Dolin, Philadelphia: Churchill Livingstone, pp: 2386-2393.
2. Hassanjani Roushan, M.R., M. Mohrez, M. Smailnejad, M.J. Soleimani and M.H. Hajiahmadi, 2004. Epidemiological features and clinical manifestation in 469 adult patients with brucellosis in Babol, Northern Iran. *Epidemol. Infect.*, 34: 1109-1114.
3. Salari, M.H., 2002. Seroepidemiological survey of brucellosis among animal farmers of Yazd province. *Iranian J. Publ Health.*, 31: 29-32.
4. Al Dahouk, S., H. Tomaso, K. Nockler, H. Neuauer and D. Frangoulidis, 2003. Laboratory based diagnosis of brucellosis- a review of the literature. Part<sup>22</sup>. *Clin Lab.*, 49: 577-589.
5. Hajia, M., M. Rahbar and A. Hosseini, 2007. Brucellosis antibody level of hospitalized patients in Hamedan, western Iran. *Shiraz Med. J.*, 8: 1-5.
6. Bokaei, S., L. Sharifi and H. Alizadeh, 2008. Epidemiological survey of brucellosis in human and animals in Birjand, east of Iran *J. Anim. Vet Adv.*, 7: 460-463.
7. Al Sekait, M., 1999. Seroepidemiological survey of brucellosis antibodies in Saudi Arabia. *Annals. Saudi Med.*, 19: 219-222.
8. Atmaca, S., T. Ozekinci, N. Akpolat, S. Elci, A. Suay and E. Arikan, 2004. *Brucellosis seroprevalence* in southeast Turkey. *Turk J. Med Sci.*, 34: 251-255.
9. Cetinkaya, F., M. Nacar, A. Nedrat Koc, S. Gokahmetoglu and T. Aydin, 2005. Prevalence of brucellosis in the rural area of Kayseri, central Anatolia, Turkey. *Turk J. Med Sci.*, 35: 121-126.
10. Apan, T.Z., M. Yildirim and E. Istanbuloglu, 2007. Seroprevalence of brucellosis in human, sheep and cattle populations in Kirikkale (Turkey). *Turk J. Vet. Anim Sci.*, 31: 75-78.