

Prevalence of Brucellosis in Horse North-East of Iran

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ABSTRACT

Brucella preferentially infects cattle, swine, sheep, and goats. However, some epidemiological surveys have been carried out to investigate nonruminants, such as horses. Horse brucellosis has been found in clinical cases, but there are few epidemiologic patterns. Between May 2008 and April 2009, a total of 120 horses were screened for brucella infections in Mashhad, Iran, by the rose bengal test and the tube agglutination test. Sera from three horses were found positive by rose bengal test and tube agglutination test, and therefore the prevalence rate was 2.5%. In horses, the highest individual seroprevalence was in an animal kept close under the intensive system, with other animals such as cattle, sheep, and goats. The zoonotic aspects of brucellosis from the horse must, therefore, be considered because the disease is important from a public health standpoint. The present study documents the first serological evidence of *Brucella* spp. infection in horses in Iran.

Keywords: Brucella; Horse; Iran

INTRODUCTION

Brucellosis is still one of the world's major problems as a topical disease, both in human beings and in animals. It is caused by various species of *Brucella*.¹ Although brucellosis and its means of transmission were discovered over 100 years ago, the disease remains a worldwide problem, predominantly in developing countries.²

Naturally acquired *Brucella* infection in horses associated with infected cattle (*B. abortus*) and swine (*B. suis*) and horizontal transfer has been demonstrated.³ But horses appear to be more resistant to infection than cattle, swine, and goats.

The seroprevalence of brucellosis in various animals such as cattle, sheep, goats, camels, poultry, and human were described in Iran.⁴⁻⁷

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Because there is no published report about brucellosis in horses in Iran, this study was performed as the first cross-sectional survey to uncover epidemiological patterns of brucellosis in horse in the north-east part of Iran.

MATERIALS AND METHODS

Between May 2008 and April 2009, a total of 120 healthy horses were randomly selected to determine the seroprevalence of brucellosis and risk factors associated with the disease from horses. The survey was carried out in a cold region of Mashhad, Khorasan state, Iran (Fig. 1).

Blood samples were obtained by venipuncture and transferred to the laboratory under chilled conditions, as soon as possible. Serum was isolated by centrifuging the blood samples at 2000g. All serum antibodies were tested for *Brucella* genus using slide agglutination by rose bengal test at cell concentrations and tube agglutination test (TAT) by 2-mercaptoethanol, using whole cell antigen (Razi Vaccine and Serum Research Institute) used for the presence of antibodies against *B. abortus* strain.

The data were analyzed with the SPSS (Statistical Package for Social Sciences) for Windows version 11.5 software and confidence level of 95% were assumed.

RESULTS

All 120 animals selected in these areas belonged to various owners. The seroprevalence of brucellosis varied significantly ($\chi^2 = 63.37$, $P < .001$) from 0% to 3.3% in various districts of the state. Sera from three horses were found positive by rose bengal test and TAT. Of these, one of the positive reactions was weak. The TAT results in horse number one was 1/320 whereas in the remaining two horses were 1/160.

The study also investigated the prevalence of horses in different districts. A correlation and regression analysis was carried out for prevalence of disease in various districts in relation to its horse population. There was no correlation between disease and horse population ($P < .6$).

DISCUSSION

It is suspected that horse brucellosis may be a potential source of infection for human beings and other animals.⁸ Horses are relatively resistant to infection; however, disease



Figure 1. Geographical location of Khorasan state in Iran.

can occur and brucellosis can be transmitted from horses to human beings.⁹ Most human infections result from physical contact with infected animals.¹⁰ It is reasonable to speculate that aborted material and infected vaginal discharges of cattle and swine could be a factor in the spread of *Brucella* to horse and vice versa.¹¹ Infection with *B. abortus* should be considered in cases of supraspinatus bursa, also known as fistulous withers, the most common manifestation of brucellosis in horses.⁹ Transmission typically occurs through contact with infected animals or materials with skin abrasions.¹² Ribeiro et al. tested fistulus withers secretions and found that the organism was secreted along with the fluids.¹³

Epizootiological investigation in the region of residence of human brucellosis revealed localization of disease in domestic animals—goats, sheep, cattle, horses, and donkeys.¹⁴ The occurrence of brucellosis in human beings is directly linked to the epizootic of animal brucellosis.¹⁴

The seroprevalence rate in this study was found to be 2.5%. Equine showed a wide variation of brucellosis occurrence, from 0.24 in low prevalence regions to 37.50% in high prevalence regions (27.5%).¹⁰ The disease in high endemic regions such as Africa, Mediterranean, Middle East, parts of Asia, and Latin America remains an uncontrolled problem.¹⁵⁻¹⁸ Brucellosis in horses has been reported in Middle East from Egypt (5.88%),¹⁹ India (12.89%),²⁰ and Pakistan (5.78%).^{21,22} The findings described in this article emphasize the importance to develop a national program and response protocol for prevention of brucellosis in Iran.

This is crucial, especially considering the fact that there is no human vaccine available. There is no vaccine approved for use in horses in Iran. There is also no effective treatment

for brucellosis in infected animals.²³ Therefore, brucellosis continues to be a major problem in Iran despite the existence of a “test and slaughter” strategy program for eradication.

CONCLUSION

The results of our epidemiological investigations indicate that control and eradication programs among animals should be regarded as a priority measures in prevention of brucellosis.²³ The zoonotic aspects of *brucellosis* from horses must, therefore, be considered because the disease is important from the public health standpoint. When the disease exists in horses, which is a reservoir,²⁴ it is a concern for human public health.

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