

The Epidemiological status of Brucellosis in Divandarreh city, Kurdistan Province, Iran, in 2020

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Abstract

Background: Brucellosis, a bacterial zoonosis, is transmitted directly or indirectly from infected animals to humans. This disease has always been endemic in Iran over the past years and is one of the most common infectious diseases in Kurdistan province.

Objectives: This study was conducted to investigate the epidemiological status of Brucellosis in Divandarreh city, Kurdistan Province, Iran, in 2020.

Methods: In this retrospective-analytical study, all patients with Brucellosis who were referred to Divandarreh Health Center in 2020 were included. Demographic and clinical data of all patients were recorded.

Results: In 2020, 195 cases of human brucellosis were reported to Divandarreh health center. Regarding geographical distribution, 6 (3.1%) patients were from urban and 189 (96.9%) patients were from rural areas. One hundred and two (52.3%) patients were male and 93 (47.7%) patients were female. About the job, the highest frequency was observed in housewives with 81 (41.5%) patients. Regarding age, the highest frequency of brucellosis was reported in the age group of 20-40 years (47.7%).

Conclusion: In the present study, most cases of brucellosis have been reported in rural areas. The majority of the population of Divandarreh live in villages that have direct contact with livestock, so planning to increase vaccination for livestock in these areas can be a potential solution to reduce the frequency of the disease.

Keywords: Epidemiology, Brucellosis, Zoonosis, Iran.

Introduction

According to the reports of the World Health Organization (WHO), among 1709 pathogenic agents, 832 agents (49%) are transmitted from animals to humans.¹ Brucellosis is a systemic infection caused by intracellular bacteria of the genus *Brucella* transmitted from animals to humans (zoonosis) which is known by different names such as Gibraltar or rock fever, Bang's disease, Mediterranean fever, Maltese or Malta fever, undulant fever or Cyprus fever.²

This disease occurs in humans in acute, sub-acute, chronic, and localized forms. Brucellosis is transmitted from animals to humans through contaminated food products, direct contact with infected animals, or inhalation of airborne particles, so the most common way of transmission is eating and drinking raw dairy products or non-pasteurized dairy products.²

Malt fever disease as the most common bacterial disease shared between humans and animals with an estimate of more than half a million new cases every year around the world is still a concern from both public health and economic aspects.³ The prevalence of this disease varies widely from one country to another, so the frequency of brucellosis is higher in agricultural societies and in areas where contact with animals is prevalent.⁴

The epidemiology of this disease has changed dramatically in the last ten decades, and these changes are related to major political and social events.⁵ While the incidence of the disease in the Eastern Middle East and North African countries is still high, in Latin America (except Mexico and parts of Peru) and Southern European countries (although at a slower rate in Greece), it is decreasing to a great extent.⁶ In the Eastern Mediterranean, five countries (Syria, Saudi Arabia, Iraq,

Iran, and Lebanon) are among the top ten countries with the highest incidence rate in the world. Iran is one of the countries with an annual incidence rate of 8-50 cases per 100,000 population in the world.⁷

By examining the incidence and prevalence of disease in Iran, the disease has been increasing from 1980 to 1990. From 1990 to 2010, with the start of the first and second national development programs, it decreased from 170 cases to 15.9 cases per hundred thousand people.⁸ In 2006, following the success in increasing livestock vaccination coverage in Iran, the disease trend has been decreasing, however, malt fever still occurs in most parts of the country with a high incidence.⁹ According to the report of the Department of Zoonotic Diseases of Iran, the cases of malt fever in the country increased by 55% during 2010-2013, so that in 2013, the incidence of malt fever increased in Kurdistan by 166%, Kermanshah by 50%, Hamedan by 128%, Zanjan by 95%, West Azerbaijan by 83%, Qazvin by 82%, and Kohgiluyeh and Boyer Ahmad by 50%.¹⁰

Objectives

One of the most important prerequisites for applying appropriate health programs for the prevention, control, and eradication of the disease in each region is to have appropriate statistics and epidemiological information. Therefore, considering that this disease is always endemic in Iran in the past years and it is one of the most common infectious diseases in Kurdistan province and Divandarreh city, this study aims to investigate the epidemiological status of Brucellosis in Divandarreh city, Kurdistan Province, Iran, in 2020.

Methods

This descriptive study was conducted in Divandarreh in 2020. In this study, all patients with malt fever with a definite diagnosis were examined. A definitive diagnosis of Malt fever was made according to the standard definition, which means having clinical symptoms such as fever, headache, loss of appetite, sweating, extreme tiredness, back and joint pain, and having a positive Coombs test. All affected people who were referred to government health centres and private clinics were included in the study. The information of the patients,

including age, gender, occupation, place of residence (city or village), the reason for infection, history of non-pasteurized dairy consumption, and season of infection were recorded in a checklist.

Statistical analysis

The continuous variables were expressed as the mean \pm SD, and the categorical variables were presented as a percentage and frequency. Because the data showed a non-normal distribution, the chi-squared test was used to comparisons. All statistical analyses were performed with SPSS (version 16.0, SPSS Inc, Chicago, IL, USA). A “P-value” less than 0.05 was considered significant.

Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki. Institutional Review Board approval was obtained.

Results

In 2020, 195 cases of human malt fever were reported to the health center of Divandarreh city. Regarding geographical distribution, 6 people (3.1 percent) were from the urban area and 189 people (96.9 percent) were from rural areas (Figure-1). The statistics of Malt fever patients according to gender; 102 cases (52.3%) were male and 93 cases (47.7%) were female, and the ratio of male to female was 1.09 (Figure-2). Regarding age, most cases of Malt fever were reported in the age group of 20-40 years (47.7%) (Figure-3). According to the frequency chart of infected people regarding occupation; the highest frequency was related to housewives with 81 cases (41.5 percent) (Figure-4). Regarding seasonal distribution as shown in chart 4, the highest rate of disease with 38 cases was reported in July (19.5%) and in the summer season (Figure-5).

The mean age of the patients at the time of the disease was 36.9 ± 15.6 years old, 37.1 ± 16.4 years old in men, and 36.7 ± 14.7 years old in women, and this difference was not statistically significant ($p=0.92$). In the comparison of the mean age of the patients living in the city and the village, the mean age of the rural patients was 36.8 ± 15.7 , and for the urban patients was 40.6 ± 11.5 , no significant differences were observed ($P=0.55$).

In examining the relationship between the type of disease (new cases or recurrence) and the history of hospitalization, there was a significant relationship ($P<0.05$). No significant relationship was observed between the type of disease and the place of residence, history of contact with livestock, age groups, gender, occupation, illness of other family members, and consumption of dairy products ($P<0.05$).

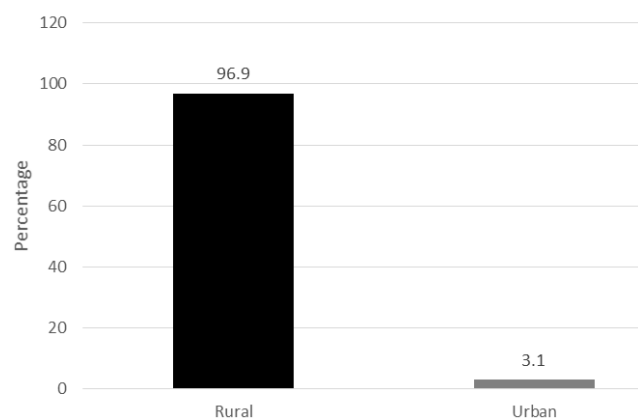


Figure-1. Frequency of Brucellosis based on place of residency (n=195) (Divandarreh city-2020)

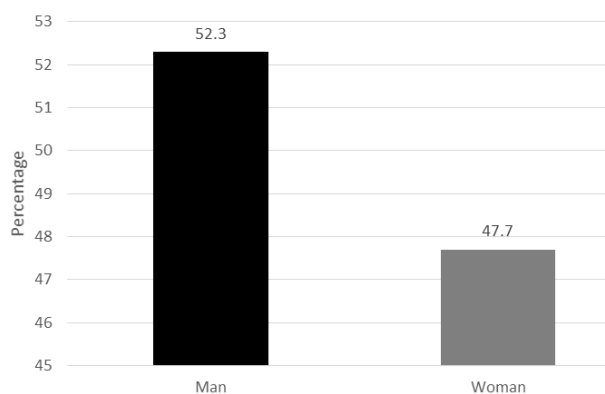


Figure-2. Frequency of Brucellosis based on gender (n=195) (Divandarreh city-2020)

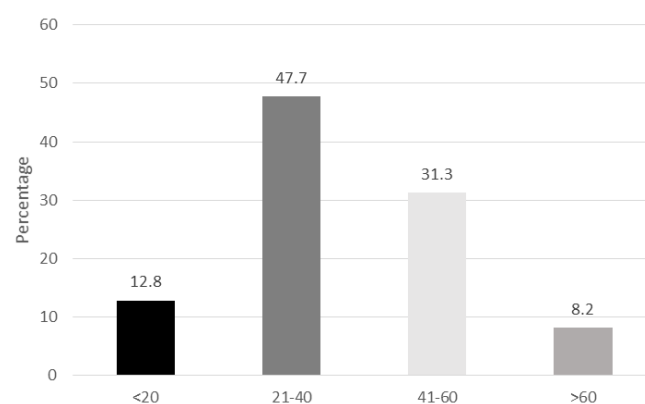


Figure-3. Frequency of Brucellosis based on age group (n=195) (Divandarreh city-2020)

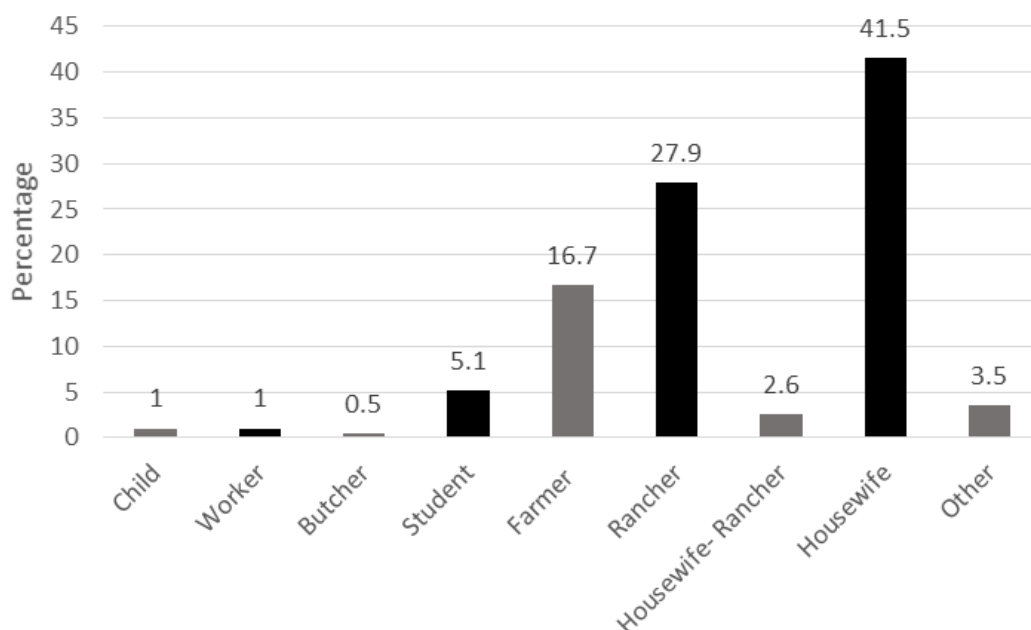


Figure-4. Frequency of Brucellosis based on occupation (n=195) (Divandarreh city-2020)

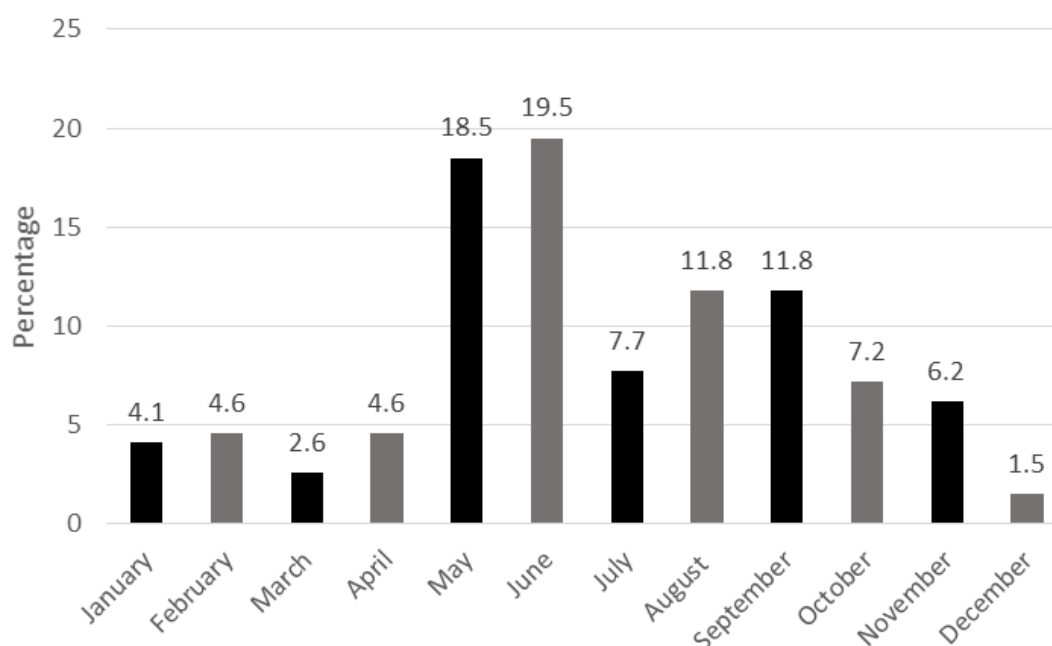


Figure-5. Frequency of Brucellosis based on month (n=195) (Divandarreh city-2020)

Discussion

In the present study, most cases of Malt fever were reported in rural people because the majority of the population of Divandarreh live in the villages and the occupation of most of the rural people is agriculture and animal husbandry, as a result, they have the most contact with livestock. In this study, although men are more affected than women (52.3% of men and 47.7% of women), most cases of the disease are observed in housewives (41.5%). Most cases of the disease in this study were reported in the summer season and in July (19.5 percent) and also the most cases of the disease are seen in the age group of 20-40 years old, which is the reason for the greater activity of this age group in terms of earning and being employed.

In the study conducted in 2015 in Amol, north of Iran, the most cases of brucellosis were recorded in men (62.1%), also 68.2% of the infected were from rural areas, and most of the cases occurred in summer (30.6%) and the most cases were in Housewives that are consistent with our study.¹¹

In another study conducted in Quchan city, northeast of Iran in 2013, 54.9% were male and 87% were rural, which is consistent with the current study. Also, in this study, the highest prevalence was reported in the spring season and

in terms of occupation, the highest frequency has been observed in livestock farmers with 25.95%.¹²

In the study of Isfahan province, in the center of Iran, in 2012, most cases of the disease were in men (69.9 percent) and 87.7 percent of cases were rural people, which is consistent with the current study. In this study, housewives and farmers had the highest percentage of patients and children had the lowest percentage.¹³

In the study of Gilaneqarb city in Kermanshah province, west of Iran, the highest incidence of disease was observed in the occupational group of livestock breeders and farmers. The most common season of the disease was spring, and the highest rate of disease transmission occurred in cases of unpasteurized milk consumption.¹⁴

In the study of Khorasan Razavi province, in the east of Iran, the most cases were during the months of May to September, and 85% of the patients living in the village and men accounted for 56.9% of the cases, and the occupations of housekeepers, farmers and, livestock farmers had the most cases of the disease, the results of this study with is consistent the present study.¹⁵

The results of the study of Kermanshah province in 2012 show that 47.4 percent of patients were female and most of the patients (81.9 percent) stated that the use of raw milk was the cause of the disease. Also, most cases of the

disease have been seen in villagers and in the seasons of spring and summer.¹⁶

In the study of Baneh city, Kurdistan, west of Iran, in 2012, the most cases were in men (52%) and the most occupational cases were related to the livestock farmer (50.4%), also 85.9% of the cases were in the village and the most cases were recorded in spring and June.¹⁷

In the study of the epidemiological characteristics of brucellosis in North Khorasan province, east of Iran, 55.3% of the cases were male. The place of residence of 71.5% of patients was in the village, which is the same direction as the present study. Also, in this study, the most observed cases were in spring and June.¹⁸

In the current study, we did not have access to all related data on malt fever which is mentioned as a limitation of this study.

Conclusions

Considering the high prevalence of malt fever in villagers and especially housewives, raising the awareness of villagers on this matter and measures such as mechanizing livestock farms and carrying out vaccination of livestock in this area can be a suitable solution to reducing the prevalence. Therefore, due to the many economic and social problems caused by this disease, it is necessary to put Malt fever as a health priority and use all the available facilities to reduce this disease.

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Competing interests

The authors declare that they have no competing interests.

Abbreviations

World Health Organization: WHO

Authors' contributions

All authors read and approved the final manuscript. All authors take responsibility for the integrity of the data and the accuracy of the data analysis.

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None.

Availability of data and materials

The data used in this study are available from the corresponding author on request.

Ethics approval and consent to participate

The study was conducted in accordance with the Declaration of Helsinki. Institutional Review Board approval was obtained.

Consent for publication

By submitting this document, the authors declare their consent for the final accepted version of the manuscript to be considered for publication.

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