



ORIGINAL ARTICLE

Epidemiological and Clinical Features of People with Malta Fever in Iran: A Systematic Review and Meta-Analysis

Mahmood Moosazadeh^a, Roja Nikaeen^{b,*}, Ghasem Abedi^a,
Motahareh Kheradmand^b, Saeid Safiri^c

^aHealth Sciences Research Center, Faculty of Health, Mazandaran University of Medical Sciences, Sari, Iran.

^bMazandaran University of Medical Sciences, Sari, Iran.

^cDepartment of Public Health, School of Nursing and Midwifery, Maragheh University of Medical Sciences, Maragheh, Iran.

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Abstract

Objectives: Numerous studies have reported the epidemiological and clinical features of Malta fever incidence in Iran. Review and synthesis of the related literature through meta-analysis can provide an appropriate measurement for aforementioned indices. Therefore, the present study aimed to determine the epidemiological and clinical features of people with Malta fever in Iran.

Methods: The required documents were obtained through searching national and international databases. In each study, standard deviation of the indices was calculated using binomial distribution formulas. Finally, the heterogeneity index was determined between studies using Cochran (Q) and I^2 tests.

Results: Combining the results of 47 articles in the meta-analysis indicated that 57.6% (55.02–60.1%) and 42.3% (49.8–44.9%) of the patients were male and female, respectively. Most of the patients lived in rural areas; 68.4% (63.6–73.2%) compared to 31.4% (26.7–36.3%). In addition, 20.8% (17.4–24.2%) of the patients were ranchers and farmers, 16.9% (14.5–19.4%) were students, and 31.6% (27–36.2%) were housewives. Of the patients studies, 50.5% (35.6–65.2%) experienced contact with animals and 57.1% (46.4–67.9%) used unpasteurized dairy products. Fever, joint pain, and sweating were detected among 65.7% (53.7–77.8%) and 55.3% (44.4–66.2%), respectively.

Conclusion: The present study revealed that the frequency of male patients with brucellosis was considerably more than that of female patients. The number of patients with Malta fever in rural areas was significantly more than in urban areas. High-risk behavior, unprotected contact with animals, and using unpasteurized dairy products were among the most significant factors affecting Malta fever incidence in Iran. Fever, joint pain, and sweating were detected among most of the patients with Malta fever.

*Corresponding author.

E-mail: Rojanikaeen@yahoo.com (R. Nikaeen).

1. Introduction

Brucellosis or Malta fever is a bacterial infection that spreads from animals to humans. Despite the preventive measurements adopted throughout the world; particularly in the Mediterranean and Iran; the disease is still a threat to public health [1,2]. Iran stands in the second rank regarding the prevalence of Malta fever worldwide [3]. Malta fever is caused by *Brucella* bacteria, particularly by *Brucella melitensis*, *Brucella abortus*, and *Brucella suis* species. In advanced countries, men are more affected compared with women. Children are more affected than adults. In Iran and other areas, in which brucellosis is endemic, there is no significant difference between infection among children and adolescents. Moreover, since Iranian rural women cooperate with men in farming and animal husbandry, they are also highly susceptible to the disease [4].

The clinical manifestations of people with brucellosis include long-term fever, anorexia, fatigue, or involvement of local organs such as arthritis [5]. Malta fever is transmitted to humans through direct contact with animals or through ingestion of infected dairy products. Therefore, it is considered as an occupational hazard for people involved in cattle-related jobs (e.g., veterinarians, slaughterhouse workers, ranchers, and farmers) [2]. Different factors play a significant role in brucellosis infection in humans. Direct and indirect contact including using unpasteurized dairy products, animal husbandry, and giving birth to ewes are significantly correlated with the disease. Because of its long-lasting effects, Malta fever is known as the disease of a thousand faces [6]. Therefore, identifying and controlling it play a crucial role in improving public health [7]. Moreover, the wide spectrum of brucellosis symptoms in human has led to the fact that diagnosed people are considerably less than the actual number of the infected population [8,9].

A database review indicates that numerous studies are carried out on the epidemiological features of Malta fever in Iran. An authentic measurement for the epidemiological and clinical features of Malta fever can be developed through combination of the research findings using meta-analysis [10]. Furthermore, through systematic review and meta-analysis of the results, we can provide well-grounded findings that can be used in public health policy-making and proposing suggestions for further research. The current research aimed to study the epidemiological and clinical features, and high-risk behaviors of people with Malta fever in Iran through carrying out a meta-analysis.

2. Materials and methods

2.1. Search strategy

Articles published in national and international journals, which were indexed in National Database, SID,

Medlib, Magiran, Iranmedex, Scopus International Database, Science Direct, PubMed, and Google Scholar, were searched for relevant articles up to April 14, 2015. The search was looking for Persian and English keywords and the possible combination of important and sensitive terms. The keywords included Malta Fever, Iran, human brucellosis, brucellosis frequency, prevalence, epidemiology, along with using “AND” and “OR” operators in article subjects and abstracts. The Persian equivalents of the words were also searched among published articles. Some Persian databases were not sensitive to the operators, therefore, just Malta fever or brucellosis were searched. To prevent missing any studies and to increase the sensitivity, the references of the papers were also checked. The search was evaluated and reviewed randomly by two other researchers and the results indicated that no article was missed. Furthermore, paper databases were also searched for those articles that were not published electronically. Experts in this field were also consulted to find other unpublished works.

2.2. Study selection

Full text or abstracts, documents, and reports found in advanced searches were extracted. After excluding duplicates, irrelevant articles were also excluded through assessing titles, abstracts, and full texts, and finally the relevant studies were selected. To avoid publication bias (transverse and longitudinal), the studies were assessed and duplicate papers were excluded.

2.3. Quality assessment

The quality of the relevant articles was evaluated using the STROBE checklist (Strengthening the Reporting of Observational Studies in Epidemiology) [11] and another checklist used in a literature review [12]. Items related to study type, sample size, research objectives, population, inclusion and exclusion criteria for primary research, analysis method, and appropriate presentation of results were determined and a score was assigned to each item. Those studies scoring ≥ 8 were included in the research.

2.4. Data extraction

In each primary study, data were extracted based on title, first author name, publication year, sample size, the province in which the study was conducted, research type, residency status, average age, occupation (rancher and farmer, students, housewives), cattle contact history, unpasteurized dairy product usage, and the most common clinical signs (fever, joint pain, and sweating). Data were extracted by two researchers. We then examined the level of agreement between the results obtained by these two researchers.

2.5. Inclusion criteria

Persian and English studies with adequate sample size on epidemiological and clinical features and high-

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