Brucellosis in High Risk Groups In Assiut Province

M.D.disseration in Tropical medicine and Gastroentrology

By

Hebatalla Mohamed Nabil

Assistant Lecturer Tropical Medicine and Gastroenterology ,Faculty of medicine ,Fayoum University

Supervised by

Prof.AbdelGhani Abel HameedSoliman

Professor of Tropical medicine and Gastroenterology

Faculty of Medicine , Assuit University

Prof. Maher Abobaker El Amir

Professor of internal medicine

Faculty of Medicine ,Fayoum University

Prof. AsmaaAbdel Al Nasser Hussein

Professor of Zoonoses

Faculty of Veterinary Medicine ,Assuit University

Director of Molecular Biology Research Unit

Prof. HebatallaGamalRashed

Professor of clinical Pathology ,Assuit University

2017

Abstract

Brucellosis is primarily an occupational disease among those working with infected livestock or handling the organism in laboratory settings. Brucellosis occurs in all seasons, most commonly in spring and summer, and mostly in adult males. It may run as an acute, subacute or chronic course depending on the immunological response of the patients themselves. **The main objective of this study was:** To Determine the *Brucella* species among the high risk individuals using Enzyme Linked Immunosorbant Assay (ELISA) in Assiut province, To Compare and evaluate the sensitivity and specificity of (ELISA) with the standard Polymerase Chain Reaction (PCR) in diagnosis of brucellosis.

Patients and methods: This study included 81 individuals as (group 1), from different occupations (farmers, slaughter house workers, veterinarians) from rural places in Assuit province in the period from October 2010 until February 2012.Thirty apparently healthy individuals were taken as a control group (group 2) and they did not have any complaint. A detailed history was obtained from each one from the selected high risk groups by questionnaire; as well as clinical assessment; Abdominal ultrasound; Laboratory investigations: Complete Blood Picture (CBC), Liver Function Tests, (ELISA) for *brucella* antibodies (IgM/IgG), and (PCR) for *brucella* species.

Results: according to the occupation ; 37% butchers, 23.5% housewife, 12.3% farmers and veterinarians, 9.9% officers and 4.9% workers. There were statistically significant difference in the studied groups as regarding contact with animals , bone pain and arthlagia (p value<0.05), while no statistically significant difference between the studied groups as regard liver function tests and CBC except for hemoglobin level(p value<0.004). 11 cases were *Brucella* Ab IgM positive(13.6%) from total studied groups , while Brucella Ab IgG negative in all studied groups. 8 cases out of 11 *Brucella* Ab IgM positive cases have positive PCR for *Brucella* species. The relationship between diagnostic sensitivity and specificity is illustrated by Roc curves; the area under the roc curve indicates the clinical usefulness of a *brucella* diagnosis, the large area under the Roc curve cross pond to better diagnosis. The Roc curve for the relation between diagnostic sensitivity and specificity of PCR test in group1 in our study shown: (81.82%) sensitivity, (100%) specificity, positive predictive value (100), negative predictive value (97.2), accuracy (97.5), area under curve(0.909).

Conclusion: ELISA IgM is more sensitive but less specific than PCR and both are equal in accuracy in diagnosis of brucellosis.

Introduction:

Brucellosis has been an emerging disease since the discovery of *Brucella melitensis* by Bruce 1887. Brucellosis is a major problem in Egypt **(3, 34).** The clinical features and presentation of human brucellosis overlaps with other infectious and non infectious disease **(7).** A proper diagnosis is important, as therapeutic failure and relapse. Chronic course and sometimes severe complications such as bone and joint involvement are characteristic of the disease **(6).**

The definite diagnosis of brucellosis is made by isolation of the organism from blood sample or other clinical specimen, furthermore, culture does not provide a rapid result and many laboratories in endemic areas do not have culture facilities. Therefore, the diagnosis often relies on serologic testing **(37).**

Serological tests for the diagnosis of human brucellosis such as (ELISA) have been developed. Furthermore, the level of sensitivity of the serological test differs for different stages

of the disease and in particular a lower sensitivity applies very early in the infection and in patients with chronic disease or experiencing relapse cases **(6).**

Recently, a few studies in the literature concerning the use of (PCR) technique for diagnosis of human brucellosis **(22, 27).**

Patients & Methods:

ELISA for *brucella* antibodies (IgM/IgG) and PCR for *brucella* species were done to81 pepole (high risk for brucellosis) (group 1) and 30 apparently healthy persons (group 2).

A detailed history was obtained from the studied subjects by questionnaire, as well as clinical assessment including:

- Age
- Sex
- History of fever, night sweating, bone pain, back pain, arthlagia.
- Presence of lymphadenopathy, splenomegaly, hepatomegaly.
- Abdominal Ultrasongraphy
- Laboratory investigations :
- Enzyme Linked Immunosorent Assay (ELISA)for *brucella* antibodies (IgM/IgG).
- Polymerase Chain Reaction (PCR) for *brucella* species.

Statistical analysis:

- Date entry and data analysis were done using SPSS version 19 (Statistical Package for Social Science). Data were presented as mean and standard deviation. Chi-square and Fisher Exact tests were used to compare between qualitative variables. Mann-Whitney test was used to compare between two quantitative variables in case of non-parametric data. P-value considered statistically significant when $P < 0.05$.
- The diagnostic criteria, such as diagnostic sensitivity, specificity and areas under ROC curves for the PCR were calculated.

Results: The Demographic clinical data of the both groups are shown in table (1)