OCCUPATIONAL BRUCELLOSIS AMONG HIGH RISKY HUMANS DURING THEIR CONTACTS WITH LIVESTOCKS IN BASRAH

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ABSTRACT

Objective: **To assess the seroprevalence of antibodies to occupational brucellosis among risky humans who are in contact with domestic animals.**

Methods: **Seroprevalence for occupational brucellosis was done on 33 sera for humans (20 veterinary doctors, 5 veterinary assistants and 8 butchers) and 235 sera for domestic animals (102 sheep, 50 goats and 83 cattle) brought to Basrah slaughter house. Sera were examined by using slide and tube agglutination methods for the presence of antibodies to brucellosis.**

Results: **The overall seropositive for brucellosis was 21.2% among high risky humans in Basrah Province, Iraq. The prevalence rates among veterinary doctors, veterinary assistants and butchers were 15%, 60% and 12.5% respectively. In this study, the overall seroprevalence among domestic animals was 23.4%. However, the positive rate among sheep, goats and cattle was 39.2%, 6%, and 14.5% respectively.**

Conclusion: **Occupational brucellosis remains a major public health problem and one of the zoonotic disease for human beings during their work.**

INTRODUCTION

Human and animal brucellosis are distributed world wide. It is one of the world's major zoonotic disease of public health and economic concern in many parts of the world. The disease is usually transmitted from infected animals to humans by direct or indirect contacts. The infection occurs by contact with vaginal discharge, urine, faeces and blood of infected animals through cutaneous, respiratory and conjunctival routes.[1] The indirect transmission to humans takes place through the consumption of unpasteurized milk or cheese.[1] Brucellosis has become a major public health concern in Saudi Arabia and other Middle East countries,[2-6] African countries,[7,8] India[9] and Latin America.[10,11] Since a very limited studies have been undertaken in an occupationally-exposed groups, the aim of this study is to assess the seroprevalence of antibodies to brucellosis among individuals who are in contact with domestic animals because of their occupation.

MATERIALS AND METHODS

Five ml blood sample was collected from each of 33 human subjects from Basrah during the last 6 months of 2010. Out of them 20 were veterinary doctors, 5 were veterinary assistants and 8 were butchers. Five ml. blood sample was collected from each of 235 domestic animals. (102 sheep, 50 goats and 83 cattle). Sera were later separated from clotted blood by centrifugation and immediately frozen at -20^{o} C until tested for the presence of *Brucella* antibodies by Rose Bengal plate test. Then, seropositive samples were confirmed by the standard tube agglutination test. The antigen obtained from the Plasmotec Company (UK). A titre of 1:8 or greater was taken as an index of seropositivity[12]. The work has been approved by the ethical committee of College of Medicine, Basrah, Iraq.

Chi-sequared (X^2) test was used for statistical significance. Differences were recorded as

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significant whenever the probability (P) was less than 0.05.

RESULTS

The overall seropositive for brucellosis was 21.2% among high risky people in Basrah Province, Iraq (Table-1). Seroprevalence among veterinary assistants (60%) was significantly higher than those detected in veterinary doctors (15%) and butchers (12.5%) (P<0.05) (Table-1).

Table 1. Seropositive for brucellosis among risky human beings.

Risky humans	No. Examined	Positive	
		No.	*%*
Veterinary doctors	20	3	15.0
Veterinary assistants	5	3	60.0
Butchers	8	1	12.5
Total	33	7	21.2

$X^2 = 4.866$; $P \leq 0.05$

In this study, the positive rate among sheep, goats and cattle was 39.2%, 6%, 14.5% respectively (Table-2). While the overall seroprevalence among those domestic animals was 23.4%. However, sheep were significantly higher than in either goats or cattle (P<0.05) (Table-2).

Table 2. Seropositive for brucellosis among domestic animals

Animals	*No. Examined*	*Positive*	
		No.	*%*
Sheep	102	40	39.2
Goats	50	3	6.0
Cattle	83	12	14.5
Total	235	55	23.4

$X^2 = 26.47$; $P \leq 0.05$

DISCUSSION

Even the number of veterinary assistants and butchers included in the study is small and reflect the disagreement of them in giving blood samples, infection was mainly due to the nature of their occupation and contacts with animals and their products. For instance, when veterinary doctors and their assistants come in contact with domestic animals during parturition and abortion is an important method of infection and transmission. A high discharge of bacteria may be often produced for upto 3 months even after normal labour.[13] In addition, butchers and slaughter house workers who are in contact with raw meat and blood of sheep, goats and cattle might be at risk and acquire the infection. Importantly, sanitation and hygienic measures in the abattoirs are unadequate and unefficient. Milk and cheese of these animals are considered as an important sources for infection for milk handlers and consumers as well.[3] The uncontrolled movement of animals especially sheep and goats in the country and cross borders makes it so difficult to control the disease in the absence of international control measures. The extensive handling and usage of animals manure as a fertilizer in agriculture would facilitate the infection and transmission of brucellosis. *Brucella* organisms remain viable for 10 weeks in soil, 7 weeks in faeces and 25 weeks in urine.[14] Air-borne infection or via abraded skin or conjuntiva have been accepted as another methods for infection. [15] Therefore, brucellosis among those animals remains a major public health problem to human beings. Animal vaccination must be undertaken because it is effective control practice. Consequently, vaccination program should be evaluated among human beings at least among those risky groups. In conclusion, doctors should be aware of brucellosis in the community and should be considered in the differential diagnosis among humans. So periodic screening especially for occupationally exposed people must be done. It would appear to be feasible to implement public

health education and vaccination strategies among humans and their livestocks. Also, to save the cost of mortalities, low productivity and treatment of domestic animals. Collaboration between veterinary and medical doctors is important in controlling the disease.

REFERENCES

1. Young EJ. Human brucellosis. Rev Infect Dis 1983; 5: 821-842.
2. Cooper CW. The epidemiology of human brucellosis in a well-defined urban population in Saudi Arabia. Trop Med Hyg 1991; 94: 416-422.
3. Al-Sekait MA. Epidemiology of brucellosis in Northern Saudi Arabia. Saudi Med J 1992; 13: 296-299.
4. Abo-Shehada MN, Odeh JS, Abu-Essud M. Seroprevalence of brucellosis among high risk people in Northern Jordan. 1996; 25(2): 450-454.
5. Al-Izzi SA, Barhoom SS. Prevalence of brucellosis among sheep and goats in Baghdad, Iraq. Iraqi J Vet Sci 1988; 1(1-2): 108-115.
6. Al-Hangawe OKS. Comparative diagnosis study of brucellosis in sheep and goats in Ninevah province using ELISA and other serological test. (M.Sc. Thesis). College of Veterinary Medicine, University of Mosul. 2006.
7. Thimm B, Wundt W. The epidemiological situation of brucellosis in Africa. Developments in Biol Standarization 1976; 31: 201-217.
8. Karimuribo ED, Ngowi HA, Swai ES, Kambarage DM. Prevalence of brucellosis in crossbred and indigenous cattle in Tanzania. Livestock Res Rural Development 2007; 19(10): 34-39.
9. Agasthya AS, Isloor S, Prabhudas K. Brucellosis in high risk group individuals. Indian J Med Microbiol 2007; 25(1): 28-31.
10. Lopez-Merino A. Brucellosis in Latin America. In: Young EJ, Corbel MJ (Eds). Brucellosis: Clinical and Laboratory Aspects. CRC Press Inc.; Boca, Raton, 1989: 151-161.
11. Wallach JC, Samartino LE, Efron A, Baldi PC. Human infection by *Brucella melitensis* : an outbreak attributed to contact with infected goats. Immunol Med Micrbiol 1998; 19: 315-321.
12. Alton CG, Jones IM, Pietz DE. Laboratory Techniques in Brucellosis. 2nd Ed. WHO: Geneva, Switzerland, 1975.
13. Alton CG. *Brucella melitensis.* In: Frank J (Ed). Networking in Brucellosis Research. United Nations University Press, Tokyo, 1991.
14. Elberg SS. Guide pour le diagnostic, le traitment et la prophylaxie de la brucellose humaine. WHO, Geneva, 1981.
15. Kauffman AF, Fox MD, Boyce JM, Anderson DC, Potter ME, Martone WJ et al. Air-borne spread of brucellosis. Ann N Y Acad Sci 1980; 353: 105-115.