SEROPOSITIVITY OF BRUCELLOSIS IN HUMAN IN SHEKHAWATI REGION OF RAJASTHAN

Manoj Kumar Kalwaniya*[1], Deepika Goklaney, Manohar Lal Sain, J.P. Kachhawa[2], Raghavendra Prasad Mishra[3], Hemlata[1] and Manisha Doot[1]

Department of Veterinary Public Health and Epidemiology, College of Veterinary and Animal Science, Rajasthan University of Veterinary and Animal Sciences, Bikaner -334001, Rajasthan, India

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ABSTRACT

In the present study,a total of 105 serum samples of suspected humans were analyzed for brucellosis by RBPT, STAT and ELISA from western Rajasthan covering 3 districts viz. Churu, Sikar and Jhunjhunu. Out of those 105 samples, 4 (03.80%) were positive by RBPT while 6 (05.71%) by STAT and 4 (03.80%) by ELISA test. The higher seropositivity of brucellosis disease in this area raises the possibility of zoonotic transmission, which poses a serious threat to the human Health.

Key words: Human serum, seropositivity, ELISA

Introduction

Brucellosis is one of the major zoonotic problems. It is caused by members of genus *Brucella*. The species of *Brucella* and their major hosts are *B. abortus* (cattle), *B. melitensis* (goats), *B. suis* (swine) and *B. Ovis* (sheep). *B.abortus* also causes infection in horses and is commonly found in chronic bursal enlargements as a secondary invader rather than a primary pathogen (Radostits *et al.,* 2000). Symptoms in human brucellosis can be highly variable as it showed nonspecific flu-like symptoms to undulant fever, arthritis, orchitis and epididymitis (Bertu *et al.,* 2012). *Brucella abortus,* is an important zoonotic disease which leading to several public health and economic problems in all over the world. In India, the prevalence of brucellosis was first established early in the previous century and since then it has been reported from almost all the states (Sehgal and Bhatia, 1990; Renukaradhya *et al.,* 2002). This disease has highly economic impact on cattle farming of which the estimated loss of US$ 58.8 million per year in India (Kollannur *et al.,* 2007).

Materials and Methods

The present study was carried out for the detection of seroprevalence of brucellosis in human. For confirmation of brucellosis in suspected samples serological tests including, Rose Bengal plate test, standard tube agglutination test and ELISA were carried out. Samples for the study included the whole blood samples, collected from human with a clinical history of pain in joints, fever, orchitis, arthritis, weakness and sweating. The blood samples collected aseptically from the humans humans from the various parts of Shekhawati region (Churu, Sikar and Jhunjhunu districts) of Rajasthan and samples were kept in a slanting position for the separation of serum from the blood clot. After retraction of the clot, serum was separated by centrifugation at 1200 rpm for 15 minutes. The serum samples were preserved at -20^{o}C in serum collection vials for conducting further serological studies. The RBPT and STAT test was carried out by methods described by Morgan *et al*. (1978) and Anton *et al.* (1975). An Enzyme Linked Immuno Sorbent Assay (ELISA) was carried out to detect bovine, caprine and human Brucella using ELISA antibody Test Kit as per manufacturer instructions (Bioassay Technology Laboratory).

Results and Discussion

A total of 105 serum samples of suspected humans which included 65 males and 40 from females i.e. veterinarians, animal handlers, animal owners and meat handlers having history of fever, joint pain, arthritis, weakness and sweating were tested for brucellosis by RBPT, STAT and ELISA from Shekhawati region of Rajasthan .Out of these 105 samples, 4 samples (3.80%) were found positive for brucellosis by RBPT, while 6 samples (5.71%) by STAT and 4 samples (3.80%) were found positive for brucellosis by ELISA test. Out of 65 male serum samples, 4.61%, 6.15% and 4.61% detected seropositive by RBPT, STAT and ELISA, respectively, whereas in female, out of 40 tested serum samples, the seroprevalence was found to be 2.50%, 5.00% and 2.50% positive by RBPT, STAT and ELISA, respectively. Statistically, seroprevalence of human brucellosis was significantly higher in males as compared to females in human beings of Shekhawati region of Rajasthan.

The results of present study are in accordance with the results reported by Metri *et al.* (2011) who found seroprevalence of brucellosis as 2.4% in the general population. Likewise, Agasthya *et al.* (2012) also identified similar seroprevalence as 3.6%. Kataria *et al.* (2011) and Panda and Chahota *et al.* (2012) observed 3.68% and 6.66% seroprevalence in veterinary professionals, respectively, which is also almost similar to present findings. Nguna *et al.* (2019) recorded the seroprevalence of brucellosis in 451 human blood samples by i-ELISA technique; the prevalence was 4.4% and is almost identical to the results of the current research. Similarly, Brahmbhatt *et al.* (2009) revealed 4.60% serum samples to be positive by STAT.

In contrast to the current findings, Deutz *et al.* (2003) reported 1% seroprevalence and Karimi *et al.* (2003) found

[1*]Ph.D. Scholar and Corresponding author E-mail ID: vetmanojkumar4585@gmail.com;[2]Assistant Professor, Department of Veterinary Medicine, RAJUVAS, Bikaner; [3]Assistant Professor, Department of Veterinary Public Health and Epidemiology, M.B. Veterinary College, Dungarpur-314 001, Rajasthan, India

Table 1: Seroprevalence of Brucellosis from suspected cases in human

Particular	Total Examined	RBPT Positive	STAT Positive	ELISA Positive	RBPT Positive (% age)	STAT Positive (% age)	ELISA Positive (% age)	P value
Male	65	3	4	3	04.61	06.15	04.61	
Female	40	1	2	1	02.50	05.00	02.50	0.5956
Total	105	4	6	4	03.80	05.71	03.80	

P<0.05 at 5 percent level of significance

6%, 10%, and 1% seroprevalence among butchers, slaughterhouse worker and other individuals using the Rose Bengal Plate test. Lokamar *et al.* (2022) reported the seroprevalence of brucellosis among human blood samples as 0.6% which is also less than the current findings. Ali *et al.* (2017) reported that contact with animals is the largest risk factor for the spread of disease (32%). Makala *et al.* (2020) found 10.9% seroprevalence by RBPT which is higher than the present investigation. Mehari *et al.* (2021) reported the overall seroprevalence of brucellosis was 31.5% by RBPT and 15.8% by ELISA which showed higher prevalence rate than present findings.

According to Meky *et al.* (2007), those persons who are regularly in contact with animals have a 2.4-time fold increased risk of contracting this illness than people who don't handle animals. As a result, males had a greater seroprevalence of human brucellosis than females, although there was no significant difference in the prevalence rate between the sexes. However, Agashtya *et al.* (2007) observed a similar finding for human brucellosis and reported greater seroprevalence in males than females. On the other hand, Kapoor *et al.* (1985) found that females were more likely than males. To cope with Brucellosis and its control, in-depth knowledge of risk factors is necessary. The frequency of this disease will be reduced by extension programs in endemic regions and among high risk populations including veterinarians and animal handlers.

Conclusion

Significantly (P>0.05) higher rate of seroprevalence in humans was observed in Sikar district by RBPT, STAT and ELISA followed by Churu and Jhunjhunu district. Sex wise seroprevalence of human brucellosiswas recorded higher in males than females. The higher seropositivity of brucellosis disease in this area raises the possibility of zoonotic transmission, which poses a serious threat to the human population and has a significant negative impact on the economy due to losses in animal productivity. The likelihood of an animal-to-animal transmission pathway is decreased by the control of brucellosis in cattle using approved measures like vaccinations with S19 or RB51.

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Conflict of interest

There is no conflict of interest as per my knowledge and belief.

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