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Zoonotic importance of brucellosis in Bidar district

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Abstract

In the present study, a total of 30 serum samples were collected from animal attendants or in contact owners to determine the seroprevalence of brucellosis in the Bidar district of Karnataka and samples were subjected to RBPT, STAT and IgG-IgM ELISA tests. The prevalence of brucellosis in animal attendants was 6.66% by STAT, 10.00% by RBPT and 30.00% by I-ELISA, respectively.

Keywords: Brucellosis, animal attendants, Bidar district

1. Introduction

Brucellosis is highly contagious disease that predominantly infects livestock, but can also infect human beings reflecting threats to public health. Brucellosis is an occupational hazard, with those most vulnerable being laboratory workers, veterinarians, abattoir workers, farmers and animal keepers who work with animals or handle aborted fetuses and animal products contaminated with brucella agents and through consumption of infected raw milk, their products and raw meat. (Shoukat *et al.*, 2017) [20]. Other means of infection include skin abrasions and inhalation of airborne animal manure particles.

Humans are susceptible to infection with *B. abortus*, *B. suis*, *B. melitensis* and rarely *B. canis* (Quinn *et al.*, 2015) [15]. Human-to-human transmission of the infection may be through breastfeeding, blood transfusion and trans-placental transmission and the clinical signs in humans comprise undulant fever, malaise, sweating, anorexia, headache, arthralgias, and back pain (Berhanu and Pal, 2020) [7]. In pregnant women spontaneous abortions mostly seen in the first and second trimester. The standard tube agglutination test (SAT) is the most commonly used serologic test for the confirmation of human brucellosis, IgM and IgG ELISA, Rose-Bengal test, flow assay and mercaptan-based tests are used in humans (Aliskan, 2008) [5].

2. Materials and Methods

Samples were taken after getting written consent from animal attendants or in contact owners.

2.1 Location of the study

The study was conducted in Aurad, Basavakalyana, Bidar, Bhalki and Humnabad talukas of Bidar district.

2.2 Study population and sampling

A total of 30 blood samples were collected aseptically from animal attendants or in contact owners with the history of fever, fatigue and swelling of joints in Bidar district. Serum was isolated from blood samples using standard protocols and stored with proper labeling at -20°C in a deep freezer until further processing.

2.3 Screening and confirmation for brucellosis

All the serum samples collected from animal attendants were initially analyzed by RBPT followed by STAT and IgG-IgM ELISA tests. Rose Bengal reagent was used from Institute of Animal Health and Veterinary Biologicals, Bengaluru, while STAT and iELISA were performed as advised by the ICAR-NIVEDI, Research Institute, Bengaluru. Chi square test was used for the statistical analysis. A p-value of ≤ 0.05 was considered statistically significant.

3. Results and Discussions

Out of 30 samples 2 samples (6.66%) were positive by STAT, 3 samples (10.00%) were positive by RBPT and 9 samples (30.00%) by I-ELISA, respectively.

Present study revealed 6.6% prevalence by STAT in animal attendants. The results were in accordance with Khan *et al.* (2017) reported a prevalence of 6%. In contrast higher prevalence of 13% by Chalabiani *et al.* (2019) [18] and 28.8% by Kavi *et al.* (2015) [9] respectively. Lower prevalence was reported by Pathak *et al.* (2014) [13] and Shome *et al.* (2017) [19] as 3.54% and 3.90%, respectively.

In the present study revealed a prevalence rate of 10% by RBPT. The results are in agreement with Saddique *et al.* (2019) [18], Kumara *et al.* (2015) [10] reported a prevalence of 10.1% and 9.3% respectively by RBPT. However, a higher prevalence than present study was reported by Reddy *et al.* (2014) [17], Tumwine *et al.* (2015) [22] as 14.92% and 17% respectively. Lower prevalence than the present study was reported by Mangtani *et al.* (2020) [11] and Ali *et al.* (2016) [3] as 2.24% and 5.8%, respectively.

The present study observed 30% prevalence rate by IgG ELISA and none of the samples were detected positive by IgM ELISA. The results were in close agreement with Niaz *et al.* (2021) [12] and Al-Hakami *et al.* (2019) [2] reported a prevalence of 32.25% and 33.9% by IgG ELISA, respectively. On contrary higher prevalence of 53.8% and 59.68% was reported by Proch *et al.* (2018) [14] and Rahamathulla (2019) [16] respectively. Lower prevalence was reported by Shukla *et al.* (2020) [21] and Aniyappanavar *et al.* (2013) [6] reported a prevalence of 11% and 9.74% by IgG ELISA, respectively.

Prevalence rate observed in the study indicated endemicity of disease among animal attendants. Al-Fadhli *et al.* (2008) [1] reported that raw milk was the major source of infection. According to Ali *et al.* (2018) [4] contact with animals (32%) occupation, primarily farmers or butchers (18%) raising animals in the vicinity of residence (14%) and drinking unpasteurised milk (4%) are risk factors for brucellosis. Beef meat consumption was substantially linked to brucellosis (Shukla *et al.*, 2022) [21].

Table 1: Prevalence of brucellosis in animal attendants by RBPT, STAT and IgG ELISA

Species	Samples tested	RBPT		STAT		IgG-ELISA	
		+ve	%	+ve	%	+ve	%
Human	30	03	10.00%	02	6.66%	09	30.00%
Chi-square value		7.274					
P-value		<0.05					

$p < 0.05$ at 5% level of significance

4. Conclusion

To conclude, the overall prevalence of brucellosis in animal attendants was 30% by I-ELISA, higher prevalence of brucellosis in animal attendants (30%) was detected by I-ELISA followed by RBPT (10%) and STAT (6.66%). Brucellosis is an occupational hazard primarily affecting farmers or animal attendants raising animals in the vicinity of residence and drinking unpasteurised milk are risk factors for brucellosis.

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