Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(4): 1206-1208

Received: 14-05-2019
Accepted: 16-06-2019

**MK Kumhar**
M.V.Sc. Scholar, Department of Veterinary Microbiology and Biotechnology, College of Veterinary and Animal Science, Rajasthan University of Veterinary and Animal Sciences, Bikaner, Rajasthan, India

**Sunita**
Assistant Professor, Department of Veterinary Microbioogy, Arawali Veterinary College (Affiliated to Rajasthan University of Veterinary and Animal Sciences, Bikaner), Dist. Sikar, Rajasthan, India

**SK Kashyap**
Professor and Head, Department of Veterinary Microbiology and Biotechnology, College of Veterinary and Animal Science Rajasthan University of Veterinary and Animal Sciences, Bikaner, Rajasthan, India

**Rajani Joshi**
Sr. Assistant Professor and P. I. Biomedical Waste Disposal Centre, Department of Veterinary Public health College of Veterinary and Animal Science Rajasthan University of Veterinary and Animal Sciences, Bikaner, Rajasthan, India

**BN Shringi**
Professor, Department of Veterinary Microbiology and Biotechnology College of Veterinary and Animal Science Rajasthan University of Veterinary and Animal Sciences, Bikaner, Rajasthan, India

**Correspondence**
**MK Kumhar**
M.V.Sc. Scholar, Department of Veterinary Microbiology and Biotechnology, College of Veterinary and Animal Science, Rajasthan University of Veterinary and Animal Sciences, Bikaner, Rajasthan, India

# Seroprevalence of bovine brucellosis in dairy cattle of Bikaner, Rajasthan

**MK Kumhar, Sunita, SK Kashyap, Rajani Joshi and BN Shringi**

**Abstract**
*Brucella* is one of the most important causative agent in bovine abortion in dairy cattle and have significance zoonotic importance in developing countries. The protocol was tested on different 168 blood samples (paired=80,unpaired=8) from HF cross dairy cattle, with a history of abortion, retention of placenta or repeat breeding or any combination of these and known to be not vaccinated, in and around Bikaner city. Out of all blood samples, 26 (32.5%) were found positive which were subjected to RBPT using Rose Bengal colored antigen. Preventive and control measures should be implemented and pursued more strictly to reduce and/or eradicate brucellosis.

**Keywords:** *Brucella*, RBPT, abortion

## Introduction
Bovine abortion caused by major bacterial agents during mid to late gestation are *Brucella* spp., *Chlamydia* spp., *Salmonella* spp., *Campylobacter* spp., *Listeria monocytogenes* and *Coxiella burnetii* [1, 2, 3]. Bovine brucellosis is one of the most important diseases worldwide, associated with bovine abortion, caused by Gram negative coccobacilli bacteria of the genus *Brucella*. Brucellosis is spread from the vaginal discharge and aborted fetal material of infected cow. Vaccination and quarantine are important for controlling and eradication of brucellosis. Zoonotic point of view it is very important disease causing undulant fever in humans.

## Materials and Methods
In the present investigation on bovine abortion was carried out by RBPT for diagnosis of *Brucella* spp.

### Sample collection
A total of 168 blood samples from HF cross dairy cattle with a history of abortion, retention of placenta or repeat breeding or any combination of these and known to be not vaccinated, in and around Bikaner city.

**Table 1:** Places and number of samples collected

| Sr. No. | Place of Samples collection | Blood Samples | |
|---|---|---|---|
| | | I | II |
| 1. | Dairy farms | 68 | 68 |
| 2. | TVCC, CVAS, Bikaner Rajuvas | 13 | 10 |
| 3. | Polyclinic AHD, Bikaner | 3 | - |
| 4. | Individual owner | 4 | 2 |
| 5. | Total | 88 | 80 |

I = First sampling at the time/near the time of abortion or retention of placenta.
II = Second sampling after 2-3 weeks of I sample collection.
TVCC = Teaching Veterinary Clinical Complex
CVAS= College of Veterinary and Animal Science
RAJUVAS= Rajasthan University of Veterinary and Animal Sciences
AHD = Animal Husbandry Department

At the time of blood sampling- II, 8 animals were not available due to sold out.

**Procedure**

For separation of serum, 5 ml. blood sample that was collected from each selected cow in a sterile test tube and kept in upright position at room temperature for about two hours, and then clot was detached from the wall with glass rod and these were transported to the laboratory of department on ice. The sera were isolated by centrifugation at 2500 rpm for three minutes. The test was carried out following the method described by Morgan *et al*., 1978 [4].

Serum samples and RBPT antigen were brought to the room temperature and one drop (30 µl) of serum was taken on a clean, dry and non-greasy glass slide by micropipette. The antigen bottle was shaken well to ensure homogenous suspension and one drop of antigen was added. The test serum and antigen were mixed with the help of a clean sterilized toothpick and slide was rotated for four minutes. Negative control was prepared by adding known brucellosis negative serum and positive control was prepared by adding antigen to known brucellosis positive serum. The result was noted during four minutes. This test was carried out for both blood sampling I and II.

RBPT antigen and normal saline solution were mixed thoroughly on a separate glass slide in order to detect auto agglutination.

**Results and Discussion**

Definite clumping/agglutination was considered as positive reaction, where as no clumping/agglutination was considered as negative reaction. Gradding/degree of agglutination as per duration of time was following (Alton *et al.,* 1975) [5].

| | | | |
|---|---|---|---|
| (i) | 0-30 sec., quick | = | ++++ |
| (ii) | 30sec.-2 min. | = | +++ |
| (iii) | 2-3 min. | = | ++ |
| (iv) | 3-4 min. | = | + |
| (v) | Negative | = | - |

All 88 and 80 serum samples were subjected to RBPT using Rose Bengal colored antigen, out of which 19 (21.59%) were found positive i. e. showing agglutination reaction in sampling I and 26 (32.5%) in sampling II. Similar rate 32.92 % of brucellosis has been reported by 33% of Sahin *et al*. (2004) [6], Otlu *et al*. (2008) [7], 31.3% by Barkallah *et al*. (2014) [8], and almost similar to 35.30% by Mitat *et al.* (2008) [9], whereas lower as compared to findings 44% by Chauhan *et al*. (2000) [10], 60% by Chakraborty *et al*. (2000) [11], 58.9% of Genc *et al*. (2005) [12], and, 50% by Chachra et al. (2009) [13], and 46.6% by Jain *et al*. (2013) [14].

The 32.5% seropositivity of brucellosis in current study is higher as compared to 27.7% of Akakpo *et al*. (1986) [15], 22.50% by Sanga *et al*. (1986) [16], 18.32 by Sarkar *et al*. (1987) [17], 3.7% to 9.5% of Bloch *et al*. (1991) [18], 6.6% (123/1860) by Mehra *et al*. (2000) [19], 18.53% by Nasir *et a*l.(2004) [20], 11.76% (8/38) by Ghodasara *et al*. (2010) [21], 13.7% by Boukary *et al*. (2013) [3], 13% by Nitu et al. (2013) [22], 21.5% by Mathew *et al*. (2015) [23] and 9.3% by Mayada *et al*. (2016) [24].

The serological study of present investigation by RBPT for *Brucella* is 32.5% lower than 100% reported by Chahota *et al*. (2003) [25]. Present study suggests that abortion in cattle might be due to infectious agents other than *Brucella*.

**References**


1. Tramuta C, Lacerenza D, Zoppi S, Goria M, Dondo A, Ferroglio E *et al*. Development of a set of multiplex standard polymerase chain reaction assays for the identification of infectious agents from aborted bovine clinical samples. J Vet Diagn Invest. 2011; 23(4):657-664.
2. Yang N, Cui X, Qian W, Yu S, Qun L. Survey of nine abortifacient infectious agents in aborted bovine fetuses from dairy farms in Beijing, China, by PCR. Acta Vet Hung. 2012; 60(1):83-92.
3. Boukary AR, Saegerman C, Abatih E, Fretin D, Alambédji Bada R, De Deken R *et al*. Seroprevalence and Potential Risk Factors for *Brucella* Spp. Infection in Traditional Cattle, Sheep and Goats Reared in Urban, Periurban and Rural Areas of Niger. PLoS ONE. 2013; 8(12):e83175.
4. Morgan WJB, Mackinnon DT, Gill KPW, Gower SGM, Norris PIW. Brucellosis diagnosis: Standard Laborator Techniques Report Series no. 1, Weybridge, England, 1978.
5. Alton GG, Jones LM, Pietz DE. Laboratory techniques in brucellosis. World Health Organization (WHO) monogram series No. 55. WHO, Geneva, 1975, 1-163.
6. Sahin M, Atabay HI, Otlu S, Unver A, Celebi O. Serological and cultural investigation of the prevalence of brucellosis in cattle, sheep and humans in Kars and its surrounding area. Proceedings of VI. National Congress of Veterinary Microbiology. Elazıg-Turkey, 2004, pp. 132-133.
7. Otlu S, Sahin M, Atabay HI, Unver A. Serological Investigations of Brucellosis in Cattle, Farmers and Veterinarians in the Kars District of Turkey. ACTA VET. BRNO. 2008; 77:117-121.
8. Barkallah M, Gharbi Y, Hassena AB, Slima AB, Mallek Z, Gautier M *et al*. Survey of Infectious Etiologies of Bovine Abortion during Mid- to Late Gestation in Dairy Herds. PLoS ONE. 2014; 9(3):91549.
9. Mitat S, Genc O, Unver A, Otlu S. Investigation of bovine brucellosis in the Northeastern Turkey. Trop Anim Health Prod. 2008; 40:281-286.
10. Chauhan HC, Chandel BS, Shah NM. Seroprevalence brucellosis in buffaloes in Gujrat. Indian. Vet. J. 2000; 77:1105-1106.
11. Chakraborty M, Patgiri GP, Barman NN. Application of delayed type hypersensitivity test for the diagnosis of bovine brucellosis. Ind. Vet., J. 2000; 77:849-851.
12. Genc O, Otlu SA, Mithat S, Aydin F, Gokce HI. Seroprevalence of Brucellosis and Leptospirosis in aborted dairy cows. Turkey Journal of Veterinary and Animal Science. 2005; 29:359-366.
13. Chachra D, Saxena HM, Kaur G, Chandra M. Comparative efficacy of Rose Bengal plate test, standard tube agglutination test and Dot ELISA in immunological detection of antibodies to *Brucella abortus* in sera. Journal of Bacteriology Research. 2009; 1(3):030-033.
14. Jain U, Basanti B, Dwivedi K. Outbreak of brucellosis in buffaloes aborted in village Mahuan, district Mainpuri, U.P., India- A case report. Veterinary World. 2013; 6(1):51-52.
15. Akakpo AJ, Saley M, Bornarel P, Sarradin P. Epidemiologie de la brucellose bovine en Afrique tropicale II: Analyse serologique et identification des deux premie` res souches de *Brucella* abortus biotype 3

au Niger. Rev Elev Me´d ve´t Pays trop. 1986; 39:175-179.
16. Sanga JF, Mukangi DJA, Graza T. Bovine brucellosis in the Lakezone of Tanzania, The present situation. Bull. Anim. Hlth. Prod. Africa. 1986; 34:230-234.
17. Sarkar SC, Boxi KK, Sodi SS. Studies on the incidence of infertility and abortion in dairy animals. J Res. Punjab. Agri. Univ. India. 1987; 24:105-110.
18. Bloch N, Diallo I. Enqueˆte se´rologique et allergologique sur les bovins du Niger. Rev. Elev Med Vet Pays Trop. 1991; 44:117-122.
19. Mehra KN, Dhanesar NS, Chaturvedi VK. Seroprevalence of brucellosis in bovine of Madhya Pradesh. Indian Veterinary Journal. 2000; 77:571-573.
20. Nasir AA, Parveen Z, Shah MA, Rashid M. Seroprevalence of brucellosis in animals at government and private livestock farms in Punjab. Pakistan Vet. J, 2004, 24(3).
21. Ghodasara SN, Roy A, Bhanderi BB. Comparison of Rose Bengal Plate Agglutination, Standard tube agglutination and Indirect ELISA tests for detection of *Brucella* antibodies in Cows and Buffaloes. Veterinary World. 2010; 3(2):61-64.
22. Nitu Maiti SK, Mohan K. Sero-Epidemiological and Therapeutic Aspects of Brucellosis (*Brucella abortus*) in Cattle & Buffaloes. Journal of Animal Research. 2013; 3(1):65-74.
23. Mathew C, Stokstad M, Johansen TB, Klevar S, Mdegela RH, Mwamengele G, Michel P *et al*. First isolation, identification, phenotypic and genotypic characterization of *Brucella abortus* biovar 3 from dairy cattle in Tanzania. BMC Veterinary Research. 2015; 11:156.
24. Mayada G, Maged El A, Falk M, Mohamed El D, Mohamed El B, Neubauer H. Use of serology and real time PCR to control an outbreak of bovine brucellosis at a dairy cattle farm in the Nile Delta region, Egypt. Irish Veterinary Journal. 2016; 69:3.
25. Chahota R, Sharma M, Katoch RC, Verma S, Singh MM, Kapoor V *et al*. Brucellosis outbreak in an organized dairy farm involving cows and in contact human beings, in Himachal Pradesh, India. Vet. Arh. 2003; 73:95-102.