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Serodiagnosis of brucellosis in an organized swine farm in Coimbatore district of Tamil Nadu

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Abstract

Brucellosis is a major zoonotic disease and endemic in several parts of Tamil Nadu. The present study was carried out to find out the occurrence of brucellosis in intensively reared swine in Coimbatore district of Tamil Nadu. Farmer reared about 120 female and 10 male pigs for breeding. A total of 10 abortion among 15 gilts mated in a herd was reported by the swine farmer. The blood samples (n=30) from aborted gilts as well as in contact animals were collected from different age group of pigs. All the serum samples were analyzed for the presence of antibodies against *Brucella* using Rose Bengal plate test (RBPT) antigen. The overall seropositivity was found to be 40 per cent. Higher prevalence was observed in first time bred gilts and one boar when compared to grower pigs. The findings highlight the presence of brucellosis in organized pig farms, emphasizing the need for routine screening, strict biosecurity, and awareness to mitigate economic losses and prevent zoonotic transmission

Keywords: Brucellosis, swine herd, rose Bengal plate test (RBPT)

1. Introduction

Brucellosis is an economically important and contagious infectious bacterial disease of livestock caused by members of the genus *Brucella*. In pigs, the disease is primarily due to *Brucella suis*, which has a wide host range and is also pathogenic to humans, causing significant public health concerns (Radostits *et al.* 2007; Olsen & Tatum, 2016) ^[6, 4]. The infection in swine leads to reproductive failures such as abortion, infertility, orchitis, and stillbirths, resulting in considerable economic losses (Nicoletti, 2007) ^[3].

Accurate diagnosis is an essential part for control and eradication of brucellosis. Although isolation and identification of bacteria is the gold standard, it is hazardous, time-consuming, and requires well equipped laboratory facilities (Corbel, 2006) ^[1]. Therefore, serological tests remain the mainstay for large-scale screening of herds. Rose Bengal Plate Test (RBPT) helps for rapid screening at herd level, while Standard Tube Agglutination Test (STAT) and Enzyme-Linked Immunosorbent Assay (ELISA) provide confirmatory diagnosis (Gwida *et al.*, 2010) ^[2]. Despite global efforts, brucellosis remains endemic in several developing countries, including India, where pig farming is gaining importance as a source of livelihood and protein security. This study was conducted to find out the occurrence of brucellosis in an organized swine farm which reported the higher incidences of abortion using standard serological methods.

Materials and Methods

Study area and animals: The study was carried out in an organized swine farm located on the outskirts of Coimbatore, Tamil Nadu and housing approximately Large White Yorkshire (LWY) 120 female and 10 male pigs under intensive management practices. The herd comprised gilts, sows, boars, and growers of different age groups. Farmers followed standard management practices for housing, feeding, breeding management. The pigs were routinely vaccinated against classical swine fever, foot and mouth disease, and porcine circovirus. Feeding was based on the recommended nutritional requirements and the blood meal at the rate of 3 to 5 per cent occasionally supplemented to the diet.

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Clean drinking water was provided ad libitum. The farmer reported abortion in ten gilts at around 60 days of gestation. The affected gilts were approximately 12 to 13 months of age at the time of abortion. Natural service was practiced on the farm and no routine screening and vaccination was followed against brucellosis. Apart from reproductive disturbances, no other major health issues were reported.

Sample collection

A total of 30 blood samples from aborted gilts as well as in contact animals were collected from different age group of pigs. Approximately 5 ml of blood was collected aseptically from the jugular vein into sterile vacutainers. Serum was separated by centrifugation at 3000 rpm for 10 minutes and stored at -20°C until use.

Serological Tests

Rose Bengal Plate Test (RBPT) antigen was purchased from Institute of Animal Health and Veterinary Biologicals, Hebbal, Bangalore and stored at 4°C until use. The sera were screened using the RBPT antigen for initial detection of antibodies against *Brucella* as per WOA, 2021^[10].

Results and Discussion

Out of the 30 serum samples tested, 12 samples were found positive for *Brucella* antibodies by RBPT (Fig.1). Out of 12 positive samples, one sample was from boar which was used for breeding and newly purchased and introduced into the farm without screening against brucellosis.

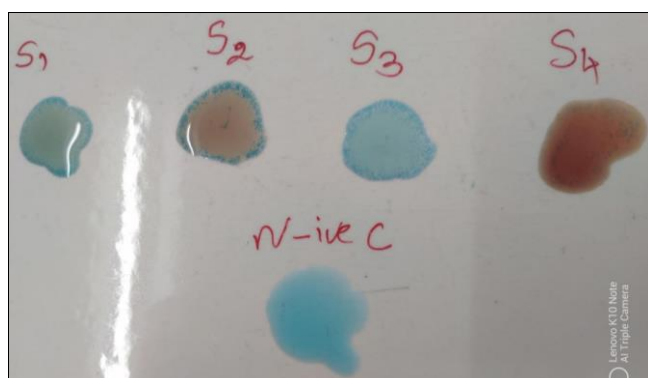


Fig 1: Rose Bengal Plate Agglutination test for suspected sera samples

Sero positivity was higher in gilts compared to adults, growers and boars. Affected animals showed histories of abortions, and reduced litter size, which were consistent with clinical manifestations of brucellosis in pigs. The detection of *Brucella* antibodies in the organized swine farm indicates the presence of active infection and a potential risk for both animal productivity and public health. The observed higher prevalence in breeding females could be attributed to introduction of infected boars into the herd and implicated for brucellosis spread in the farms through natural breeding. Similar occurrence of brucellosis outbreak in organized swine herd was reported by Thirlwall *et al.*, (2008) and Shome *et al.*, (2019)^[9, 8]. Previous studies have reported variable prevalence of swine brucellosis in India (Shome *et al.*, 2016; Preena *et al.*, 2024)^[7, 5] and worldwide, reflecting differences in management, biosecurity, and diagnostic approaches. The results of this study align with reports suggesting that brucellosis remains underdiagnosed in pigs due to lack of routine surveillance. Routine screening of newly introduced pigs and within the farms for removal of

infected pigs is important to avoid the outbreaks of the. RBPT is an important screening test to identify the swine brucellosis in herd.

Conclusion: The occurrence of brucellosis in organized farms highlights the importance of adopting preventive measures such as routine screening, culling of positive animals, strict biosecurity practices, and awareness programs for farm workers to minimize zoonotic transmission.

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Conflict of interest: No conflict of interest

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