CROSS-SECTIONAL SEROSURVEY ON BOVINE BRUCELLOSIS
IN CATTLE AND ITS EPIDEMIOLOGICAL SIGNIFICANCE IN INTEGRATED ORGANISED FARMS

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ABSTRACT

Brucellosis in bovines is mainly caused by Brucella abortus inflicting late term abortion and infertility. Infected cattle act as a main source for transmission to other animals, animal handlers and veterinarians as an occupational hazard under organized farming system. Eventhough most Brucella species has host specificity, crossing of animal host boundary is likely to occur any time in swine, sheep and goat. The serosurveillance of animal health status has to be strictly regulated for effective control of brucellosis in integrated farms. The aim of this study was to determine the apparent prevalence of brucellosis in bovine from various organized farms in Tamil Nadu using ELISA. It was found that 21.35% of the cattle screened for brucellosis were positive for anti-Brucella abortus antibodies which may definitely have an impact on cross species transmission of brucellosis. Brucellosis being endemic in India, the effective control of brucellosis in all farm animals through vaccination programme and strict seroconversion studies is essential.

Keywords: Integrated Farming – Bovine brucellosis – Cross sectional serosurvey.

Introduction

Infectious diseases of reproductive tract are major hurdle in the country, which greatly affect economy of the country. However, livestock farming in India is rapidly growing and stands first in the world in milk production (Kumar and Prabhatkar, 2013). Growth of livestock industries largely depends on health of the animals. Reproductive infectious diseases reduce the efficiency of reproductive performance, even permanent infertility in cows and sterility in bulls. Amongst, bovine brucellosis is an endemic and neglected disease in dairy animals in India, and which is zoonotic too. Being India is an agricultural based country, probability of spread by direct and indirect contact with infected animals is higher to animal and human population.

Brucellosis in bovines is mainly caused by Brucella abortus and mainly characterized by abortions, infertility and reduced milk yield (Bhanu Rekha et al., 2013). Serological evidence suggested that brucellosis is highly endemic in most parts of India (Chakraborty et al., 2000) and the seroprevalence rate ranged from 6.6% in Madhya
Pradesh to 60% in a Northeastern State of Assam (Chakraborty et al., 2000; Renukaradhy et al., 2002).

Purchase of animals without prior diagnosis and lack of awareness are found to be potential risk factors for transmission (Shome et al., 2014). Larger herd in close confinement without adequate sheds, type of animal, type of breed and knowledge/awareness of dairyman, unrestricted animal market, replacement without prior testing, reproductive disorders with absence of their testing are also posing risk under the intensive production system (Patel et al., 2014). Perhaps, lack of routine screening and monitoring may result in outbreaks in organized dairy farms. Cross-sectional survey is one of the epidemiological approaches to identify brucellosis infected animal and its elimination to prevent further spread.

**Materials and methods**

A cross-sectional serosurvey on brucellosis in integrated and/or organized farms was carried out during a month mid of the year 2014 in northern part of Tamil Nadu. A total of 89 serum samples collected randomly including animals with history of abortion were used for screening. Epidemiological information were also collected with regards to herd's production system and details of possible risk factors for bovine brucellosis. *Brucella abortus* IgG antibodies in bovine sera were qualitatively detected using Anigen B. Brucella Ab ELISA 2.0 kit.

**Results and discussion**

In this survey, 21.35% (19/89) seroprevalence was observed. The results reestablishes the endemic nature of brucellosis in integrated farms paving way for circulation of the pathogen to all susceptible populations of various livestock, wildlife and human. Prevalence of brucellosis in animals reportedly varied from as low as 0.13% (Chatterjee et al., 1986) to as high as 44% (Zaki et al., 1975). According to the annual reports of NIVEDI (National Institute of Veterinary Epidemiology and Disease Investigation, PD_ADMAS), prevalence of bovine brucellosis was 7.66% and 13% in the years 2010-11 and 2011-12 respectively.

Further work is warranted for isolation and identification of biovar of *Brucella* by conventional or molecular techniques to develop geographic specific vaccines. Control of animal brucellosis is dependent on two main principles: prevention of exposure of animals to infection and elimination of infected animals from the herd (Boral et al., 2009). The only way to bring down the incidence of brucellosis in areas with high prevalence is the mass immunization with recommended doses of approved vaccines. According to the observation and finding of this survey, calf hood vaccination is warranted. Live attenuated B. abortus S-19 vaccine is recommended at the age of 3 to 6 months, which declines the incidence of brucellosis and should cover more than 80% of the population to establish herd immunity. Vaccination should be stopped once the incidence falls below 0.2% and then infected animals must be eliminated, if the goal is eradication.

Transmission of brucellosis is directly influenced by introduction of either infected or susceptible animals from outside the herd, cattle movements, herd size and stocking density. A positive association between herd size and the purchase of replacement cattle from outside sources, which increases the probability of introducing infected cattle, and enhanced disease transmission as a result of higher opportunity for complex interactions among the population at risk, particularly in areas with greater animal concentration (Borba et al., 2013).

**Conclusion**

In view of high economic losses through reproductive failure and zoonotic implication, regular cross-sectional survey of livestock population to know the snap-shot of bovine brucellosis, awareness programme and adoption of proper prevention and control strategies such as calfhood vaccination and test-and-slaughter programmes are
necessary in countries like India, where bovine brucellosis is endemic. It also helps to identify the incidence and to know the trends in prevalence status.

References


