EPIDEMIOLOGY AND ECONOMICS OF BRUCELLOSIS IN ANIMALS AND ITS ZOONOTIC SIGNIFICANCE

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ABSTRACT

Brucellosis is endemic in animals in India caused by mainly *Brucella abortus* and *Brucella melitensis* and is readily transmissible to man as an occupational hazard. Active surveillance programme since last 20 years revealed the 9.3% positive reactors of 13396 cattle tested in organized and unorganized farms through out the country. Besides, *Brucella abortus* biotype- I has been isolated in 11% of 371 aborted bovine fetuses. In order to assess the transmission of Brucellosis from infected cattle to man, at total 119 sera of in contact persons working in cattle farms were tested and of these 34.4% was found positive for Brucellosis. A total of 7880 breedable cows and bulls were tested for the presence of *Brucella* antibodies and 980 (12.4%) bulls were found positive for Brucellosis. In order to control the Brucellosis in organized farms, test and segregation policy is being adopted and seropositive animals are kept away from the main farms under ADRIF concept, which is 'Animal Disease Research and Instructional Farm' meant for teaching and research purpose and maintained under strict biosafety conditions. Since adoption of the control programme, incidence of Brucellosis reduced dramatically to merely 1.2%. Based on the Epidemiological data of active surveillance programme, it is estimated that due to brucellosis, there is a loss of US$ 58.8 million per year in India.

INTRODUCTION

Brucellosis is one of the world's major zoonoses, which is endemic in India caused mainly by *Brucella abortus* and *B. melitensis* and is readily transmissible to man as an occupational hazard. The disease in cattle seems to be associated primarily with intensive farming practices in large organized animal farms. (Smits and Kadri 2005). Brucellosis is widely prevalent in India among the bovine population both in farms and in the villages. It causes heavy economic loss to the animal industry through abortion, delayed conception, temporary or permanent infertility in the affected animals. Based on the epidemiological data of active surveillance programme, it is estimated that due to Brucellosis, there is a loss of US$58.8 million per year in India. The present work is epidemiological investigations including isolation of *Brucella spp*. testing of serum samples and adoption of control measures.

MATERIALS AND METHODS

Samples were collected from 371 aborted cows, included parts of placenta, vaginal swabs, and samples from aborted fetuses (abomasal contents, heart blood, and peritoneal cavity fluid) as well as paired serum samples from affected animals. Isolation was attempted by following the method

of Alton et al. (1975). In present investigation, a total of 13396 cattle serum were collected from both organized and unorganized farm through out India. Serum samples were collected from a total of 7880 breedable cows from organized herds in the country having mainly crossbred population. Serum samples were also collected from 119 cattle farm workers including veterinarians, paravets, attendants etc.

Serum samples were tested by Rose Bengal Plate Test (RBPT; Alton et al., 1975), standard tube agglutination test (STAT; Alton et al., 1975) and enzyme linked immunosorbant assay (ELISA; Nielsen and Wright, 1984) employing standard procedures. The standard methods for epidemiological analysis were followed as per Thrusfield (1998).

RESULTS & DISCUSSION

Brucellosis is widely prevalent through out India among the bovine population both in farm and in the village animals (Polding, 1943, 1947;Vishwanathan, 1944; Mathur, 1963,1964). Public health significance of Brucellosis is well known (Koshi and Myers, 1969). The disease has an added importance in countries like India where the conditions are conducive to wide spread human infection on account of unhygienic conditions and poverty. Present study revealed that out of 119 sera of cattle farm personnel 34.4% had the *Brucella* antibodies, which was due to the fact that they were constantly exposed to infection while milking, attending to cows during parturition and other complications. In the present study *B. abortus* biotype I was isolated from 41 (11%) clinical samples out of 371-aborted fetus. *B. abortus* biotype I is common in organized farm, while *B. abortus* biotype III is common in the villages (Yadav, 1988).

Bulls can act as a source of Brucellosis because they excrete the organism through their semen. In the present study a total of 12.4% bulls were found seropositive to the disease. The culling and segregation of positive bulls is necessary to control Brucellosis.

In India, effective control of brucellosis is a national problem. A major obstacle in the control of this disease has been the disposal of the positive animals. In brucellosis free countries, test and slaughter of positive animals is proved effective. However, in India the existing socioeconomic conditions do not advocate this policy. The alternative method of “test and segregation” is perhaps the only method, which is practical and feasible in our country.

Control programme comprised periodical testing of all animals in each farm and removal of the positive reactors immediately till no reactor animals are found. Disease free herds were treated as “closed herds”. The seropositive cattle are kept in a separate farm called ADRIF (Animal Disease Research and Instructional Farm), which is situated away from the main farm. This resulted in a reduction of incidence to merely 1.2%. ADRIF also served the purpose of teaching and research under strict biosafety condition (Ann, 2006). Similarly by adopting this method it was possible to reduce the overall incidence of brucellosis in UttarPradesh from 5.6 to 1.42% in 8 years (Pathak, 1966). Likewise in Haryana, as a result of half yearly testing and segregation of reactors on the same farm, the percentage of the positive reactors had been brought down from 25 to nil in 5 years (Sharma, 1965). To get the disease under control, it is recommended that even in the closed herds animals must be tested at regular intervals to detect ‘sub-clinical carriers’ and remove wherever necessary. Other important steps are provision of housing for animals, arrangement for segregation of aborted and infected animals, proper disposal of aborted materials and disinfections of contaminated premises besides calf hood vaccination.

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