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Research Paper

Seroepidemiology of Brucellosis Among Cattle in various Part of India

Medical Science

KEYWORDS : Brucellosis, Abortion, Epidemiology, Zoonoses

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ABSTRACT

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. 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. Analysis of disease incidence in relation to characteristics of time, place and host will help to understand the disease as well as its preventive measures to control the disease. Seroprevalence of Brucella was noted as 8.47% and among these higher seroprevalence was detected in Delhi (29.74%) followed by Jammu & Kashmir (27.02%). Least seroprevalence was noticed in Rajasthan, Meghalaya, Himachal Pradesh and Kerala.

INTRODUCTION

Brucellosis is an endemic and zoonotic disease prevalent worldwide. All species of Brucella share a high degree of genetic similarity, there was a proposal that all described species be classified within the genomospecies Brucella melitensis. This decision was reversed in 2005 and the six Brucella nomenspecies were re-approved. Brucella melitensis, B abortus and B suis are main causative agents of brucellosis. As it transmits through semen it can spread to very large population by means of artificial insemination from an infected bull. 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 (US$58.8 million per year in India) to the animal industry through abortion, delayed conception, temporary or permanent infertility in the affected animals (Kollannur et al., 2006). Analysis of disease incidence in relation to characteristics of time, place and host will help to understand the disease as well as its preventive measures to control the disease. So this study was conducted on sera samples collected from various parts of country for detecting the prevalence of brucellosis in India.

MATERIALS AND METHODS

The serum samples received from different parts of the country by the general bacteriology laboratory (CADRAD, IVRI), the sera sample collected from IVRI dairy farm and Kerala were taken for the analysis. The blood was collected aseptically from the jugular vein of each animal in a vacuumtainer (AKÜRET Medikit, Belgium). The vacuumtainers were kept in an upright position at room temperature for about two hours. The blood samples were then centrifuged at 3000 rpm for 15 minutes. The separated serum was collected in screw capped plastic vials and transported to the laboratory. The serum samples were heat inactivated at 56ºC for 30 min and subsequently stored at -20ºC temperature until further use. Collected serum samples were subjected to Brucella precoated commercial ELISA kit for detection of Brucella antibodies.

RESULT AND DISCUSSION

Brucellosis is considered as a major zoonotic disease causing heavy economic losses, both directly and indirectly. The prevalence of animal brucellosis may be an indirect indicator of human brucellosis because of the intimate contact of animals with human beings particularly in rural areas. Moreover, the major sources of infection are consumption of contaminated food. Infection is also obtained as an occupational hazard. Nearly every case of brucellosis has an animal origin and, therefore, control is primarily a veterinarian's responsibility (Nicoletti, 1992). Although, the conventional cultural method of isolation is most reliable (Cetinkaya et al., 1999) and the gold standard test for diagnosis (Bricker, 2002) of brucellosis, Brucella species are slow growing organisms, taking longer time for proper identification. In addition, the contaminants of the sample and reduced number of Brucella organism are other difficulties. Hence, serological techniques play major role in diagnosis.

A total of 1982 serum samples from bovine were subjected to enzyme linked immunosorbent assay and 143 serum samples were found positive for brucella antibodies with an overall seroprevalence of 8.47%.maximum number of samples were obtained from Uttarakhand. Higher serprevalence was detected in Delhi (29.74%) followed by Jammu & Kashmir (27.02%). Least seroprevalence was noticed in Rajasthan, Meghalaya, Himachal Pradesh and Kerala. The details of the samples are given below in table 1.

Table 1

States	Total	Positive	Seroprevalence
Chhattisgarh	101	2	1.98
Delhi	195	58	29.74
Himachal Pradesh	43	0	0
Jammu &Kashmir	74	20	27.03
Kerala	203	1	0.49
Maharashtra	168	35	20.83
Meghalaya	9	0	0
Rajasthan	100	0	0
Uttar Pradesh	585	26	4.44
Uttarakhand	504	1	0.2
Average	198.2	14.3	8.47

Of the total of sera tested (1982), 8.47% were found positive by ELISA. Rathore et al. (2002) revealed a seropositivity of 32.99% of cattle population in organized farms compared to 5.31 % of village cattle. While Isloor et al. (1998) reported overall prevalence rate of Brucella antibodies of 1.9% in cattle and 1.8% in buffalo. More or less similar results were obtained in cattle and buffaloes using ELISA by Tongaonkar et al. (1986), Mehra et al. (2000), and Sandhu et al. (2001) with a seropositivity of 5.3%, 6.3%, and 9.33%, respectively. The higher seropositivity of 16.07% 26.5%, 13% and 15.03% were recorded, respectively, by Nagal et al. (1991) Chand et al. (2004) and Jaianadh et al.

(2006). While Isloor et al. (1998) observed a lower seropositivity of 1.95% and 1.9% respectively.

CONCLUSIONS

Seroprevalence of Brucella was noted as 8.47% with highest seroprevalence in Delhi (29.74%). As brucellosis is a major zoonotic disease, it must get significant care in prevention and control. This subclinical brucellosis can also have high impact on milk production. Calf hood vaccination with B. abortus Strain-19 can be used for control of brucellosis in cattle and buffaloes.

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