Title of Dissertation: Serological and molecular diagnosis of brucellosis and impact of managemental practices on its control in cattle and buffaloes

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Abstract

During the present study a total of 2345 whole blood samples (1730 cattle and 615 buffaloes) and 9 aborted material samples were collected from the selected animals. All the samples were screened using Rose Bengal Plate Test (RBPT). An overall seroprevalence of 20.89% was observed. Among the three agro-climatic zones highest prevalence was observed in central zones (22.62%). Cattle were found to be more susceptible to infection compared to buffaloes (p ≤ 0.01). A battery of four serological tests viz Rose Bengal Plate Test (RBPT), indirect Enzyme linked immunosorbent assay (I-ELISA), Micro-agglutination test (MAT) and modified Micro-agglutination (mMAT) were evaluated on 900 serum samples. A total of 260 samples were found positive by RBPT, 352 samples were positive by I-ELISA, 281 by MAT and 262 by mMAT. A substantial degree of agreement was observed between I-ELISA and rest of the tests. Fifty *Brucella* positive animals were followed for four months and samples were collected at monthly intervals. The titre end points were determined using MAT. Some of the animals were having low titres at the beginning, which rose over the period of time, while others had very high titres which declined with time. PCR detected amplicons of 193-bp in 68 sera and 6 samples from aborted foetuses and a least degree of agreement was observed between I-ELISA and PCR. All the 6 positive aborted foetal materials were identified to be positive for *B. abortus*. PCR using DNA from six *B. abortus* strains amplified five fragments of 1682, 794, 587, 450 and 152 bp in size. PCR with *B. abortus* S19 DNA did not produce 587bp fragment common to *Brucella* strains tested. For risk factor identification data from 39 dairy farms were collected analysed, and factors which increased the risk of an animal being infected with *B. abortus* included, no precaution taken regarding visitors, no disinfection of farm premises, female introduction without testing, farm replacement, breeding method, serological testing, attitude with positive animals, culling of affected animals, knowledge of farmer about brucellosis and herd size (p < 0.05). For observing the impact of managemental practices on control of brucellosis ten dairy farmers were selected. Out of these ten farmers 9 could bring down the prevalence of the disease to a very low level. From the results it is evident that educating the farmers may prove very fruitful for combating this disease which has assumed alarming prevalence in India in general and Punjab in particular.

Key words: Brucellosis, cattle, Buffaloes, Rose Bengal Plate Test, Risk factors,