CHAPTER - V

DISCUSSION

The study, Sero-diagnostic study of animal handlers for Brucellosis was conducted in the Department of Medical Microbiology, School of Health Sciences, Kannur University, over a period of 24 months. 445 serum samples from occupationally exposed individuals, grouped into three – Group I, II and III, were screened for antibodies against Brucella abortus. Each group consisted of both test and control samples.

5.1. SEROPOSITIVITY TO BRUCELLOSIS

Clinical picture of brucellosis in man is very heterogenous and non specific which may be represented either by subclinical or atypical infection in both the acute and chronic stages. Out of the 445 serum samples tested, 295 (66.29%) serum samples represented the occupationally exposed test population and 150 (33.7%) serum samples were from individuals who were not exposed to animals and were considered as control group.

The high sero-prevalence of Brucella infection among occupational-risk population, with prevalence rate of up to 43.8% for abattoir workers is reported by several researchers. (Ocholi et al., 1993). In the present study the exposure rate noted was based on the result of I-ELISA and the results was seen high among veterinary practitioners (7.22%) and are closely followed by slaughter house workers (6.36%). Asanda and Agbede (2001) also reported that, infection seems more associated with humans
engaged in livestock and livestock product activities than those engaged in other productive ventures.

5.2 COMPARISON OF CONVENTIONAL AND NEWER TECHNIQUES

In this study three serological tests were used to screen the antibodies. The tests used were RBPT, STAT and I-ELISA. RBPT was the rapid test and the results 58 (19.66%) samples came positive by this method. This indicates that it can be used as a screening test when large amount of serum is needed to be tested. STAT gave positive only in 2 (0.67%) samples and this relatively less positivity may be due to blocking effect of incomplete antibodies present in serum. The two positive samples were also showed positivity by RBPT and ELISA methods. 13 (4.4%) of samples came positive by I-ELISA. This was considered as the most specific test among the three methods. Paweska et al. (2002) suggested that ELISA could replace not only the confirmatory CFT, but also other two screening test, namely the RBPT and STAT. Gall and Nielsen (2004) after reviewing various serological tests, concluded that no individual test found to be perfect, however error could be minimized using the most reliable test. ChandPandSharma (2004) advocated the use of ELISA in comparison to RBPT and STAT. In a study conducted by Vahora (2011) reported that AB ELISA is more sensitive and specific than RBPT for detecting antibody against Brucellosis.

Out of the total 210 samples studied in group I, RBPT tested positive in 44, while STAT tested positive in 2 and I-ELISA in 7. A similar study conducted by Anisur et al., 2009 examined 210 subjects by slide agglutination test, Rose Bengal plate agglutination test and Standard agglutination test. Among them, 9 (4.28%), 7 (3.33%) and 7 (3.33%) were positive for brucellosis.
respectively. Out of the total 165 samples studied in group II, RBPT tested positive in 31, while I-ELISA tested positive in 6. None of the samples were positive to STAT. Among the six positive cases identified by I-ELISA, one was positive to both IgG and IgM antibodies. Out of the total 83 samples studied from Veterinary Doctors, RBPT tested positive in 17, while I-ELISA tested positive in 6. None of the samples were positive to STAT. Among the six positive cases identified by I-ELISA, one was positive to both IgG and IgM antibodies.

5.3 PREVALENCE OF BRUCELLOSIS AMONG THE THREE OCCUPATIONAL GROUPS

Among the 210 samples studied, 110 samples were from slaughter house workers and the prevalence of brucellosis was 14.76% as detected by RBPT, 1.81% as detected by STAT and 6.36% as detected by I-ELISA. While the control population showed a prevalence rate of 13% only by RBPT while the STAT and ELISA were negative in all the 100 samples. A study conducted by Thakur and Thapliyal (2002) from India revealed a Prevalence rate of 4.97% in samples obtained from persons exposed to animals that is not correlating with our study.

Among the total 165 samples studied in group II, 130 samples were from test group, which includes 85 serum samples collected from veterinary doctors and 35 serum samples collected from livestock inspectors. The control group consisted of 35 serum samples collected from school teachers. The prevalence detected was, 20% by RBPT, 7.05% by ELISA while none of the samples showed agglutination by STAT. The sero prevalence of Brucellosis in livestock inspectors was 17.02% and was noted only by RBPT.
The findings of other workers report was in the range of 6% to 28% among hospital patients. A study conducted by Thakur and Thapliyal, (2002) from India revealed a prevalence rate of 4.97% in samples obtained from persons exposed to animals that is less than what we got in our study. Another study by Mathur (1964) from north India reported seroprevalence of 8.5% among dairy workers in contact with infected animals. Another study conducted by Agasthya et al. (2007) examined 618 serum samples from veterinary Personnel and found 15.69% tested positive. Another similar study conducted by Hemashettar and Patil (1991) reported 8.2%.

Group III consisted of a total of 70 serum samples, among which 55 samples represented the test group and 15 samples from control. Out of the 55 one each from group III A and group IIIC came positive by RBPT method. The Seroprevalence noted 4% in farmers owning cow and 8.33% in farmers own goat. None of the samples showed positive result by STAT and IELISA. A study conducted by Anisur et al., (2009) compared the Seroprevalence of different occupational groups compared, out of 300 clinically suspected brucellosis cases, 23(7.67%) were positive of human brucellosis varied significantly which rationale with relation of farmers where infection was more in animal farmers (17.74%), followed by house wives (9.38%).

Among the 18 farmers owning goat, there was no prevalence of brucellosis detected by RBPT, STAT and I-ELISA. Among the 12 farmers owning buffalo, prevalence of brucellosis was 8.33% as detected by RBPT, while there was no prevalence detected by STAT and I-ELISA.

5.4 RISK GROUPS
Among the 7 positive cases of brucellosis detected by I-ELISA, within slaughter house workers, 14.29% (1 each) were in the age groups of 28-34 yrs and 49-55 yrs respectively, 28.57% (2) were in the age group of 35-41 yrs, while 42.85% (3) were in the age group of 42-48 yrs. More prevalence in this age group could be due to increased activities with regards to their occupation, thereby enhancing the risk of acquiring the disease. A study by Ahmed (1997) from Bangladesh showed 43% subjects in the age group between 21-40 years are more susceptible to infection.

Among the 6 positive cases of brucellosis detected by I-ELISA, within veterinary doctors, 16.67% (1 each) were in the age group 27-34 yrs and 44-52 yrs respectively, while 66.67% (4) were in the age group of 35-43 yrs. The increased prevalence in this age group may be due to their active participation to their occupation and thereby enhancing the risk of acquiring infection.

Among the 7 positive cases of brucellosis detected by I-ELISA, within slaughter house workers, all (100%) were males. Among the 6 positive cases of brucellosis detected by I-ELISA, within veterinary doctors, 5 (83%) were males and 1 (17%) was female.

Similar findings of male dominance (86.92%) over female (13.08%) subjects were reported in study by Salari (2002) from Iran with male to female ratio 6.65:1. The increase member of male patients over female in this study might be due to occupational exposure to animals. Male are the active and main earning member of the most of the family still now, so they are more privileged to visit physician chamber for treatment.

Another study by Zafer et al. (2005) from Turkey showed that the prevalence of brucellosis was higher female (6.3%) than in
male (3.1%). This may be due to, most likely because of their increased exposure to domestic animals in rural area.

5.5 OTHER FINDINGS IN POSITIVE CASES

Among the 7 positive cases of brucellosis within slaughter house workers (Group I A), detected by I-ELISA, two were having the habit of drinking raw milk. Among the 7 positive cases of brucellosis within slaughter house workers (Group I A), detected by I-ELISA, only one had relapsing cycles of fever. Among the 6 positive cases of brucellosis within veterinary doctors (Group II A), detected by I-ELISA, two had relapsing cycles of fever. Even though so many reports and literatures are supporting the presence of night sweat in patients suffering with Brucellosis we could not identify such reports in our study. Among the 7 positive cases of brucellosis within slaughter house workers (Group I A), detected by I-ELISA, five had frequent arthralgia. Among the 6 positive cases of brucellosis within veterinary doctors (Group II A), detected by I-ELISA, two had frequent arthralgia.

Extreme tiredness and weakness are the common symptoms of acute Brucellosis but in the present work we could not identify anyone with weakness and tiredness. Among the 7 positive cases of brucellosis within slaughter house workers (Group I A), detected by I-ELISA, and the 6 positive cases of brucellosis within veterinary doctors (Group II A), detected by I-ELISA, none had enlarged lymph nodes. This is an unusual complication of Brucellosis but there are reports suggesting the presence of necrotising and suppurative lymphadenitis in Brucellosis cases. But in the present study we could not identify such reports among the positive cases.
Among the 7 positive cases of brucellosis within slaughter house workers (Group I A), detected by I-ELISA, only one had orchitis while the 6 positive cases of brucellosis within veterinary doctors (Group II A) detected by I-ELISA, none had orchitis. *Brucella* epididymo-orchitis (BEO), first described by Hardy in 1928, is a focal genitourinary complication of human brucellosis. This disease is endemic in many parts of the world, but might present as a diagnostic and therapeutic challenge to practicing physicians in nonendemic areas (James et al., 2011). Among the 7 positive cases of brucellosis detected by I-ELISA, within slaughter house workers (Group I A), all had Grade 3 level of exposure. Among the 6 positive cases of brucellosis within veterinary doctors (Group II A) detected by I-ELISA, 5 had Grade 3 level of exposure while 1 had Grade 2 level of exposure.

Among the 7 positive cases of brucellosis detected by I-ELISA, within slaughter house workers (Group I A), one (14.29%) had occupational exposure for a period of 6-10 yrs, while 3 (42.85%) each had occupational exposure for periods of 11-15 yrs and 16-20 yrs respectively. Among the 6 positive cases of brucellosis within veterinary doctors (Group II A) detected by I-ELISA.

Brucella are not difficult to grow and disperse, and transmission to humans may result in prolonged illness and long-term sequelae (Yagupsy and Baron, 2005). Aerosol or food contamination could be the sources of dispersion. This microorganism has the advantage of being debilitating without being fatal. The infective dose for these organisms is very low, if acquired via the inhalation route. It has been estimated that 10-100 organisms are sufficient to constitute an infectious aerosol dose for humans.