



Brucellosis in Wayanad Tribal Goat Population: A Preliminary Serological Survey

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Abstract: Caprine brucellosis is an endemic disease and is present in many countries. It causes heavy losses in goats and is transmissible to man. The study aimed at determining the seroprevalence of caprine brucellosis for the first time by serological tests in Wayanad district of Kerala, where goat rearing is the main occupation among tribal women. A total of 24 sera were positive by the RBPT with a seroprevalence of 5.7%. Upon STAT testing of all the 420 sera, 18 out of 24 samples (4.3%) showed presence of *Brucella* antibodies. Considering sensitivity, specificity and ease in performing the test, it is suggested that a combination of RBPT and STAT can be used in the diagnosis of caprine brucellosis in order to control and eradicate the disease.

Keywords: Caprine Brucellosis, Serological Tests, RBPT, STAT, Kerala.

1. Introduction

Goats are the major source of livelihood for the jobless women tribes of Wayanad District of Kerala. There is a good demand for its meat in this region due to the expansion of the tourism trade. But due to the frequent complaints of loss of milk production, abortion in late pregnancy, stillbirth and reproduction failure many farmers are reluctant to take up goat rearing. Though the history and clinical signs are suggestive of brucellosis, no systematic study has been conducted on this problem. For diagnosis, although isolation still remains the "gold standard", serological tests prove to be a better alternative as cultural examination is time consuming and handling the organism is hazardous. Keeping in view of the above circumstances it was felt that it would be worthwhile to conduct a preliminary serological survey on the prevalence of brucellosis.

2. Materials and Methods

The study was carried out using serological tests for a period of one year from May 2007.

2.1 Collection of sera samples

A total of 420 blood samples constituting about 1% of the total goat population in the region was collected randomly from apparently healthy goats of different age and sex from different flocks. Serum was separated and the samples were stored at -20°C until use. Of these 420 samples, 77 were from males and 343 from females with 132 samples from less than 1 year of age, 151 in 1-2 years and 137 samples above 2 years of age. All the sampled flocks were managed under semi-intensive system of management and the goats surveyed were not vaccinated against brucellosis.

The samples collected were subjected to Rose Bengal Plate Test (RBPT) and Standard Tube Agglutination Test (STAT) as described by Alton (1970). Coloured antigen for RBPT and *Brucella abortus* plain antigen for STAT were procured from the Institute of Animal Health and Veterinary Biologicals (IAH and VB), Hebbal, Bangalore. Statistical analysis of the data was done according to the method described by Martin *et al.*, (1988).

3. Results

Of the 420 sera examined, 24 (5.7%) were seropositive to RBPT, out of which only 18 (4.3%) reacted positively to STAT (Table 1). Sex and age-wise analysis of data are summarized in Table 2 and 3. The prevalence was higher in female goats (6.1% by RBPT and 4.7% by STAT) than in males (3.9% by RBPT and 2.6% by STAT). Percent positivity increase gradually on advancement of age. Less than 1 year showed seropositivity of 1.5% by RBPT and 0.8% by STAT;

age group of 1-2 years with 5.3% and 4% by RBPT and STAT, respectively and more than 2 years with 10.2% (RBPT) and 8 % (STAT).

Table 1. Seroprevalence of Caprine Brucellosis in Wayanad district.

Serological test employed	Total number of sera screened	Number positive	Percent positive
RBPT	420	24	5.7
STAT	420	18	4.3

Table 2. Sex-wise distribution of *Brucella* antibodies.

Sex	Number of sera tested	RBPT		STAT	
		Number positive	Percent positive	Number positive	Percent positive
Males	77	3	3.9	2	2.6
Females	343	21	6.1	16	4.7
Total	420	24	5.7	18	4.3

Table 3. Age-wise distribution of *Brucella* antibodies.

Age group	Number tested	RBPT		STAT	
		Number positive	Percent positive	Number positive	Percent positive
Less than 1 year					
Male	20	0		0	
Female	112	2		1	
Total	132	2	1.5	1	0.8
1-2 years					
Male	31	1		1	
Female	120	7		5	
Total	151	8	5.3	6	4
More than 2 years					
Male	26	2		1	
Female	111	12		10	
Total	137	14	10.2	11	8

4. Discussion

Brucellosis is a zoonotic disease that can infect several domestic animals. The result of the present study indicates a seropositivity of 5.7% which is in accordance with Singh *et al.*, (2010) who reported 5.8% with RBPT and STAT in goats of Jammu region. Kumar *et al.*, (1997) recorded a prevalence of 16% and 30% in Punjab and Rajasthan, respectively which is higher than the present study.

The overall seroprevalence of brucellosis was higher in females than in males. Ahmadu *et al.*, (1999); Folhadella *et al.*, (2001) and Agrawal *et al.*, (2007) also recorded similar findings. It may be due to the preferential localization of *Brucella* organisms in the Uterus and high erythritol content of placenta, which stimulates growth of these organisms (Bala and Sidhu, 1982). It was also reported that the serological response of males to *Brucella* infection is limited (Crawford *et al.*, 1990) and one research finding also showed that males were more resistant than females (Nicoletti, 1980).

The seroprevalence of brucellosis was higher in older than in younger animals. The susceptibility to

brucellosis appears to be more commonly associated with sexual maturity than age (Rodostits *et al.*, 2005).

Several serological tests have been used in the diagnosis of brucellosis in farm animals and pets (Blasco, 1994; Abd El-Razik *et al.*, 2006). Although, sensitivities are different, simple and economical tests are usually preferred in epidemiological studies. The most widely used Serological tests in diagnosis of Brucellosis are the agglutination test (Fraser *et al.*, 1991). The present study indicates that RBPT is more sensitive than STAT as stated by Mahajan and Kulshresta (1991); Ghani (1995) and Omer *et al.*, (2000). In sheep, Asghar *et al.*, (2005) noticed lower specificity of IgM ELISA compared to RBPT. Though STAT detected a least number of samples as positive, statistically there was no significant correlation exist with RBPT. The specificity of STAT was more than RBPT as it recorded the least number of positive cases. Olayinka *et al.*, (2000) and Singh *et al.*, (2004) could also find similar results. All these findings suggest that brucellosis is present in the region and proper steps are necessary to control the disease.

5. Conclusion

With the advent of newer assays like ELISA and PCR, the diagnosis of brucellosis becomes easier but keeping in view, the simplicity, low cost and ease of application in the field condition, we conclude basic serological tests like RBPT and STAT have its own existence and may prove more effective for screening.

The result of the present study indicates that infected goats constitute a public health hazard to the tribal population of Wayanad district. This warrants the introduction of mass vaccination for goats as well as a public awareness program on socioeconomic and public health significance of the disease.

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