SEROPREVALENCE OF LEPTOSPIROSIS IN SHE-BUFFALOES
(Bos bubalis) AT SLAUGHTER IN CHENNAI, INDIA

J. Selvaraj1, B. Murali Manohar1, R. Govindarajan2, Vajiravelu Jayakumar2, T.V. Meenambigai3 and C. Balachandran4

ABSTRACT

Seroprevalence of leptospirosis in she-buffaloes in Chennai, India were detected by microscopic agglutination test. Leptospirosis was detected in 88 percent of 125 sera samples tested. The most prevalent serogroup observed was Pomona (54.4 percent). Highest titre of 6400 was detected with the serogroup Pomona (0.4 percent).

Keywords: buffalo, leptospirosis, microscopic agglutination test, Pomona, seroprevalence

INTRODUCTION

Buffaloes are reared for milk, meat and ploughing/draft purposes in India. Out of a population of 1.65 million buffalo Tamilnadu, 2.3 lakhs are reared in Chennai, Kancheepuram and Tiruvallur districts (Anon, 2004). Animals are sold for slaughter because they are uneconomical to maintain for milk production or unsuitable for breeding due to infertility or sterility and at times because their owners are in need of money. Leptospirosis, a major zoonotic disease of animals and man, is of significant public health importance. It is one of the incriminating agents for jaundice (John et al., 1980) and abortion (Sharma et al., 1982) in buffaloes causing heavy economic losses to livestock farmers. Epidemiological studies carried out in different countries have shown that leptospirosis occurs in buffaloes (Bos bubalis) and that both clinical and subclinical infection can occur (Kujumgiev, 1963; Andreani et al., 1974; Arora and Baxi, 1978; Farina, 1989; Ciceroni et al., 1995). In India, Adinarayanan et al. (1960) were the first to report leptospirosis among buffaloes in Uttar Pradesh. Subsequently, seroprevalence among buffaloes has been reported from many parts of India (Pande et al., 1961; Bhatnagar et al., 1967; Arora and Baxi, 1978; Srivastava and Kumar, 2003).

In southern peninsular India, the seroprevalence of leptospiral antibodies in buffaloes has been reported by many authors (Hussain, 1973; John et al., 1980; Basha et al., 1982; Ratnam et al., 1983; Ramakrishna, 1986; Seenivasan, 1995; Ramani Pushpa and Punya Kumari, 2005; Selvaraj et al., 2005). Information on the current status of seroprevalence among buffaloes in Tamilnadu state is inadequate. As a continuous study on the seroprevalence of leptospirosis in buffaloes is needed, the present work was undertaken.

MATERIALS AND METHODS

Sera samples were collected from 125 she-buffaloes, which were brought to slaughter at Corporation Slaughterhouse, Chennai. These buffaloes were apparently healthy adults brought by private farmers of Chennai, Kancheepuram and

1Central University Laboratory, 2Leptospirosis Research Laboratory, Centre for Animal Health Studies, Madhavaram Milk Colony, Chennai-600 051, India
3Animal Biotechnology Unit, Madras Veterinary College, Madhavaram Milk Colony, Chennai-600 051, India
4Department of Veterinary Pathology, Madras Veterinary College, Chennai 600 007, India
Tiruvallur districts. All the sera samples were inactivated at 56°C for 30 minutes and stored at -20°C until tested.

The microscopic agglutination test (MAT) was performed as described by Cole et al. (1973). A panel of 12 strains representing 12 serovars of *Leptospira interrogans* known to circulate in Chennai were used. These strains were grown in Ellinghausen - McCullough / Johnson - Harris (EMJH) basal medium containing 10 percent EMJH enrichment medium (Difco) and 4 to 7 day old cultures were used as antigen. Antigen panel included live culture representing serogroups Australis, Autumnalis, Ballum, Canicola, Grippotyphosa, Hebdomadis, Icterohaemorrhagiae, Javanica, Pomona, Pyrogenes, Sejroe and Tarassovi.

Initially each serum was diluted 1 in 50 in phosphate buffered saline and 25 μl of it was added to an equal volume of each of the antigens' mixed and incubated for two hours at 37°C and agglutination tested by dark field microscopy at X100 magnification. The reacting sera were then titrated against the respective antigen. The endpoint was defined as the highest serum dilution that showed an agglutination of 50 percent or more of leptospires.

A microscopic agglutination (MA) titre of 50 or greater was considered positive in this study. When the serum was reacting to more than one antigen, the one giving highest MA titre was considered as the reacting serogroup and the remaining as cross reacting serogroups.

**RESULTS AND DISCUSSION**

Out of the 125 sera samples of she-buffaloes tested, 111 (88.8 percent) reacted with one or an other of the leptospiral antigens used (Table 1). The anti leptospiral antibodies that occurred in the sera in the frequency of descending order were: Pomona 68 (54.4 percent), Australis 52 (41.6 percent), Sejroe and Hebdomadis each 31 (24.8 percent), Pyrogenes 29 (23.2 percent), Tarassovi 23 (18.4 percent each), Autumnalis 17 (13.6 percent), Canicola 6 (4.8 percent) Icterohaemorrhagiae 3 (2.4 percent) Ballum and Grippotyphosa each 2 (1.6 percent) and Javanica 1 (0.8 percent). Serogroups like Ballum, Grippotyphosa and ieterohaemorrhagiae were not the primary reacting serogroup but they were observed to be only cross reacting serogroups in this study.

The MA titres against various serogroups ranged between 50 and 6400 (Table 2). Out of 265 positive reactions 51 (19.3 percent), 82 (30.9 percent), 68 (25.7 percent), 30 (11.3 percent), 21 (7.9 percent), 10 (3.8 percent), 2 (0.8 percent) and 1 (0.4 percent) had MA titres of 50, 100, 200, 400, 800, 1600, 3200 and 6400, respectively. High seroprevalence observed in the present study is in accordance with Seenivasan (1995), who reported 85.7 percent seropositivity in buffaloes, whereas Srivastava and Kumar (2003) reported only 2.7 percent seropositivity in buffaloes in India. The prevalence of antileptospiral antibodies observed in the present study to different serogroups was also previously reported (Ratnam et al., 1983; Venugopal et al., 1986; Gupta, 1997; Selvaraj et al., 2005).

Ratnam et al. (1994) observed that 39.3 percent of 56 buffalo sera samples were positive for leptospiral antibodies and the titres were 1:50 and above with the predominance of Autumnalis followed by Pomona in Tamilnadu; whereas Ramakrishna (1986) detected Pomona in 31.65 percent and Autumnalis 10.12 percent out of 79 MAT positive buffalo sera samples. Selvaraj et al. (2005) detected Pomona in 45.33 percent out of 75 sera samples screened. In the present study also Pomona was the most common serogroup detected in buffaloes (54.4 percent) which indicated the continuous high prevalence of the serogroup in buffaloes in Tamilnadu. The high percentage of positivity among the buffaloes could be due to their
habitation. Most of the private owners rear buffaloes in small herds and allow their buffaloes to wallow in sewage drainage (Coovam river) and dried ponds in and around Chennai as water sources are scarce in the city. As water buffaloes are considered as shedders of leptospira (Carlos et al., 1970) they could perpetuate the cycle of transmission and could endanger the life of unprotected human and animal hosts. Hence, a continuous systematic seroprevalence study for a considerable period and isolation of local isolates may provide useful information to decide on the serogroup to be included in the vaccine production to control the disease in domestic livestock.

REFERENCES


*Continued on page 108


---

*Continued from page 97*


