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Prevalence of leptospirosis in cattle in Jabalpur

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Abstract
The present study was undertaken to determine the prevalence, of Leptospirosis in cattle in Jabalpur. A total of 400 cattle were screened under the study. The cattle belonged to the organized dairy farms of Jabalpur. Out of 400 cattle, 70 blood samples were collected with a history of repeat breeding, abortion, hemogalactia and mastitis. Enzyme linked immune sorbent assay (ELISA) was performed for seroprevalence study in serum samples of suspected cattle. Seroprevalence was high in clinically ailing (suspected) cases in organized dairy farms.

Keywords: Leptospirosis, cattle, enzyme linked immune sorbent assay

Introduction
Leptospirosis is a significant zoonotic disease that occurs in diverse epidemiological settings and affects vulnerable populations of both animals and human beings (WHO, 1999) [5]. Leptospirosis is caused by pathogenic spirochetes of the genus *Leptospira*, which belongs to the family *Leptospiraceae* and order *spirochaetales*. Cattle harbour leptospires in their kidneys for a few days to even years, thereby contaminating the environment and serving as a source of infection for human beings. Leptospirosis has been under-reported and under-diagnosed in India due to non-specific symptoms, complex laboratory tests, fastidious nature of bacterium, and lack of diagnostic facilities. Bacteria are slow-growing and require a rich medium at a neutral pH, making it challenging to cultivate leptospires from natural sources (Zacarias *et al.*, 2008) [6].
Enzyme-Linked Immuno- sorbent Assay (ELISA) is one of the methods used for carrying out sero-prevalence study and presumptive diagnosis and was predominantly designed to detect antibodies, referred to as indirect ELISA. Under the present study, the prevalence of Leptospirosis in cattle was undertaken using indirect ELISA.

Material and Methods
- For the present study, screening of 400 cattle was done with a history of repeat breeding, abortion, hemogalactia, and mastitis was done in organized dairy farms and 70 samples were collected.
- 5 ml of blood was collected aseptically from the jugular vein of properly restrained cattle in clot-activated vacutainers. They were kept in an upright position at room temperature for 2 hours for serum separation. The straw-coloured serum was then poured into 1.5 ml sterile cryovials and aliquoted for future use. Samples were transported to the laboratory and stored at -20 °C till further use.
- Sero-prevalence of samples (Indirect ELISA) was done by Vet Checkbovine Leptospira indirect ELISA kit which detects specific antibodies (Ab) directed against *Leptospira interrogans* in cattle. Indirect ELISA was performed strictly as per the standard protocol described in the kit.

Results and Discussion
The sero-prevalence of leptospirosis in cattle among suspected samples was 32.85 per cent i.e. among 70 suspected samples of cattle, 23 were found to be seropositive whereas, it was 5.75% among total screened cases. In clinically ailing cattle, higher sero-prevalence (44.11%) was reported in cattle with the history of abortion followed by repeat breeding (25.00%). In the cases of hemogalactia/mastitis the seroprevalence was 12.50 per cent.

Table 1: Seroprevalence of leptospirosis in cattle

Screened	Suspected	Positive	Seroprevalence among screened cases (%)	Seroprevalence among suspected cases (%)
400	70	23	5.75	32.85

Table 2: Symptom wise seroprevalence of leptospirosis in clinically ailing cattle

Symptom	Suspected	Positive	Seroprevalence (%)
Abortion	34	15	44.11
Repeat breeding	28	07	25.00
Haemogalactia / Mastitis	08	01	12.50

Similar to the present findings, high seroprevalence in cattle (47.06%, 24/51) was also recorded from Valsad, Gujrat by Patel (2014) [2]. In buffaloes high seroprevalence i.e. 54.14 % was reported in Gujarat (Balakrishnan *et al.*, 2011) [1], 26.66 % in Andaman and Nicobar Islands (Varma *et al*., 2001) [4] and 88.8 % (125/111) in Chennai (Selvaraj *et al*., 2010) [3]. The high sero-prevalence in Jabalpur can be justified with location of organized dairy farms which are situated nearby to water bodies leading to favourable conditions for growth and sustenance of leptospires and easy transmission among cattle in densely populated farms.

Conclusion

Leptospirosis affects vulnerable populations of both animals and human beings. In cattle it is the cause of abortion, repeat breeding, hemogalactia and mastitis in cattle. The present study revealed that leptospirosis is prevalent organized farms in Jabalpur.

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