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Prevalence of subclinical mastitis in cattle using modified California mastitis test

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Abstract

The study was conducted to determine the prevalence of subclinical mastitis in cows in and around the Bikaner city by using Modified California Mastitis Test (MCMT). A total 200 milk samples from 50 cows were screened by Modified California Mastitis Test for identification of subclinical mastitis. The overall animal wise and quarter wise prevalence of subclinical mastitis on the basis of MCMT was 38.00% (19/50) and 29.50% (59/200), respectively.

Keywords: Prevalence, subclinical mastitis modified California mastitis test

1. Introduction

Mastitis is a multi-etiological complex disease, which is defined as inflammation of parenchyma of mammary gland characterized by physical, chemical changes in milk and pathological changes in glandular tissue (Radostits *et al.*, 2009) [13]. Etiological agents of mastitis can be infectious or noninfectious (Watts, 1988) [15]. Mastitis is a complex disease that occurs in clinical and sub-clinical forms (Quinn *et al.*, 1999) [12].

Clinical mastitis is manifested by observable signs of inflammation of udder and gross abnormality in quantity and quality of milk and is usually referred to as individual health problem, whereas sub-clinical mastitis remains to be a herd problem, without observable clinical signs or no gross changes in the milk, which may be detected by the various indirect tests like Modified California Mastitis test (MCMT), Somatic Cell Count (TSCC), NAGase test and Electrical Conductivity (EC) of milk (Dangore *et al.*, 2000) [3]. The Modified California mastitis test is a simple, inexpensive, rapid and highly sensitive test that accurately predicts the inflammatory cell counts and infection in milk from individual quarters or pooled milk samples (Joshi and Gokhle, 2006 and Madut *et al.*, 2009) [10].

The occurrence of clinical mastitis would be propositional to the prevalence of sub-clinical mastitis, because an existing sub-clinical phase of intra mammary infection (Fagiolo and Lai, 2010) [5]. Although sub-clinical mastitis occurs worldwide, besides causing huge economic losses to milk production, the sub-clinical mastitis remains a continuous source of infection to other herd mates (Marwaha, 2018) [11].

2. Materials and Methods

2.1 Collection of milk samples

The study was conducted on 200 quarter milk samples of 50 apparently healthy lactating dairy cows from Livestock research station (LRS), Rathi farm, College of Veterinary and Animal Science, Bikaner and individual holding in and around the Bikaner city. Milk samples from all the four quarters of these animals were collected aseptically by washing the teats, drying and sterilized with cotton soaked in 70 percent ethyl alcohol.

2.2 Diagnosis

All aseptically collected milk samples were subjected to Modified California Mastitis test. Mastitic milk samples showed a varying degree of precipitation and gel formation during stirring depending upon the severity of mastitis due to presence of leucocytes. Depending on the degree of precipitation and gel formation, readings of positive test were categorized as weak positive (+), distinct positive (++) and strong (+++) positive, respectively.

3. Results and Discussion

Prevalence of sub-clinical mastitis was 38.00 percent (19/50) and 29.50 percent (59/200) on cow basis and quarters basis. Similar finding were observed by Islam *et al.* (2011) ^[6] and Khelef *et al.* (2013) ^[8] who reported the prevalence of sub-clinical mastitis on basis of MCMT was 29.50 and 29.20 percent, respectively. But Kushwaha (2016) ^[19] recorded the 16.29 percent milk samples were found to be modified California mastitis test positive. Singh and Baxi (1980) ^[14] reported that 85.56, 90.43 and 87.25 percent milk samples were positive to Mastaid test, Sodium Lauryl Sulphate Test (SLST) and California mastitis test (MCMT). MCMT always gives strong positive reaction in the first week after calving or in the last stage of lactation as reported by Radostits *et al.* (2009) ^[13]. So cows in early lactation and late stage of lactation were excluded from the study. El-Sayed *et al.* (2015) ^[4] stated that MCMT could be used to determine the severity of subclinical mastitis on the basis of degree of gel formation. Badiuzzaman *et al.* (2015) ^[1] and Cerqueira *et al.* (2017) ^[2] concluded that MCMT is most accurate and reliable diagnostic test for field conditions, as it does not require laboratory facilities and skilled personnel.

4. Conclusion

The study revealed a significant prevalence of subclinical mastitis among dairy cows in and around Bikaner, as assessed by the Modified California Mastitis Test (MCMT). With 38.00% of cows and 29.50% of quarters affected, these findings underscore the widespread nature of this subclinical form of mastitis. Similar studies corroborate these results, highlighting the persistence and economic impact of subclinical mastitis in dairy herds globally. Effective management strategies and continued surveillance are crucial to mitigate the economic losses and maintain udder health in dairy farming practices. Further research into preventive measures and treatment protocols can enhance dairy production sustainability and animal welfare.

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