

Demographic Incidence of Recumbent Cow Syndrome In Cauvery Delta Region of Tamil Nadu, India

A. Thamizharasi, M. Veeraselvam*, N. Premalatha, S. Senthilkumar, K. Karthika, M. Saravanan and P.K. Ramkumar

Department of Veterinary Medicine, Veterinary College and Research Institute, Tamil Nadu Veterinary and Animal Sciences University, Orathanadu.

Abstract

This study investigates the demographic incidences of recumbent cow syndrome in 156 recumbent cows referred to veterinary hospital over a period of 9-month from March 2023 to November 2023 at Veterinary Clinical Complex, Veterinary College and Research Institute, Orathanadu. They were examined & categorized based on breed, age, and period of occurrences. The incidence of recumbent cow was higher incidences during May month and lower during November month. Whereas the highest incidence of recumbent cow syndrome was noticed in Jersey crossbred cow (69.8%) followed by Holstein Friesian cross bred (25.0%) and native breeds (5.1%) whereas higher incidence of recumbent cow syndrome was observed in cows with the age group of 6 to 8 years. These findings emphasize the need for targeted management strategies to address this challenging metabolic disorder in dairy farming, considering specific time period or season, breeds, and age groups.

Keywords: Downer cow, Breed, Age, Season

Introduction

Dairy farming plays a significant role in securing the livelihood of rural farmers by providing employment and income generation in rural areas and ensuring nutrition to poor rural households (Senthilkumar *et al.*, 2014). Most challenging issues affecting dairy productivity is the presence of production induced metabolic diseases resulting from negative balance of a particular nutrient. Most of metabolic disorders occur around calving and are associated with transition period of the cow from 3 weeks before parturition to 3 weeks after parturition (Radostits *et al.*, 2007). Among the metabolic disorders, recumbent cow syndrome is one of the most common and costly disease that occurs in lactating dairy animals during the peripartum period. The downer cow syndrome is caused by several etiological factors including metabolic disorders caused by mineral deficiency, injury during parturition, paralysis by nerve and muscle damage after calving, nervous and musculoskeletal problems following recumbency and systemic diseases caused by toxemia (Radostits *et al.*, 2007), among mineral deficiency hypocalcaemia is one of the most common primary cause of recumbency cow, approximately 58% of animals manifest within 1 day of parturition and 37% during the first 100 days of lactation (Yogeshpriya *et al.*, 2019). This study deals with the incidence of downer cow syndrome in Cauvery delta region of Tamil Nadu.

Materials and Methods

The study was conducted at Department of Veterinary Medicine, Veterinary College and research Institute, Orathanadu. A total of 156 recumbent animals were examined and treated during a period of 9 months from March 2023 to November 2023 in which the signalment, anamnesis was recorded and also the cause of recumbency was investigated thoroughly by careful physical and clinical examination and laboratory analysis before each treatment. All the recumbent cows were categorized according to the causes of recumbency as per the clinical examination and laboratory analysis to assess the incidence and etiological factors causing recumbency in dairy cows. Incidences of recumbent cow syndrome were studied according to breed, age and period of occurrence (months) based on the data obtained during examination of animals.

Result

a. Month wise incidence

The month wise incidence of recumbent cow presented during the study period was presented in Table 1 (Fig. 1). The incidence of recumbent cow was higher during May month and lower during November month. Highest incidence of recumbency in pre calving and post calving recumbent cows were noticed during June month and May month respectively.

*Corresponding author : drveeraselva@gmail.com

b. Breed wise incidence

Out of 156 recumbent cows examined during study period, the highest incidence of recumbent cow syndrome was noticed in Jersey cross bred cow (69.8%) followed by Holstein Friesian cross bred cows (25.0%) and native breeds (5.1%) (Fig .2). Among them Incidence/ prevalence is highest in post calving Jersey cross bred cows. The breed wise incidence of recumbent

cow encountered during the study period were presented in (Fig.2)

c. Age wise incidence

Comparatively the higher incidence of recumbent cow syndrome was observed in cows with the age group of 6 to 8 years (41.6%), followed by the recumbent cows with age of 3 to 6 years (24.3%), recumbent cows with the age of above 8 years (21.7%) and those cows with below 3 years (12.1%) (Fig. 3).



Fig. 1. Month wise incidence of recumbent dairy cows

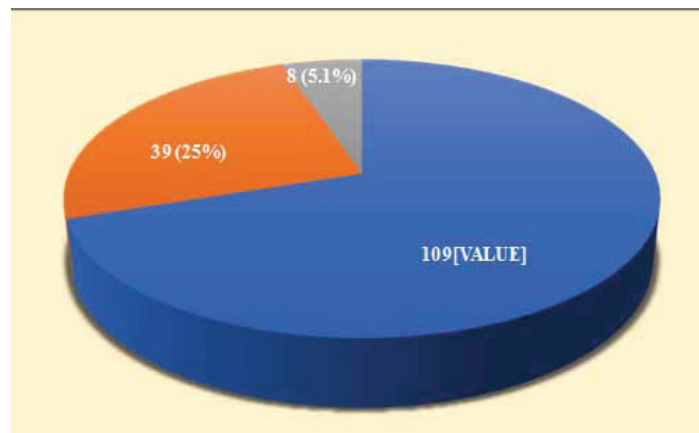


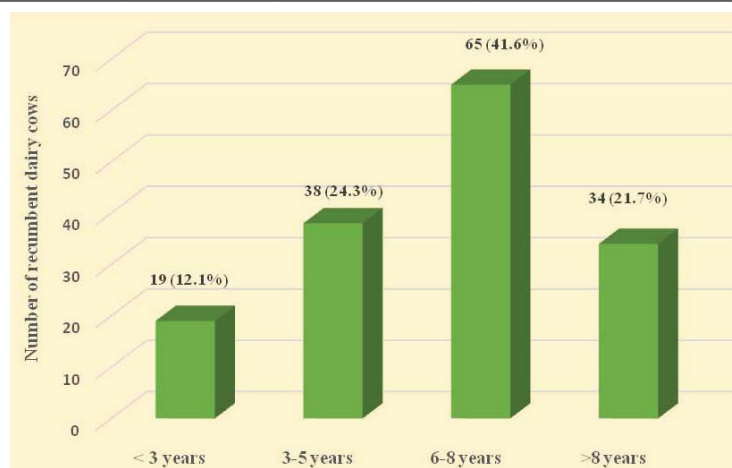
Fig. 2. Breed wise incidence of recumbent dairy cow

Table 1. Month wise incidence of recumbent dairy cows

Recumbent dairy cows	Total No.	Months (from March 2023 to November 2023)								
		Mar	Apr	May	June	July	Aug	Sep	Oct	Nov
Pre calving recumbent cows	54 (34.6%)	8 (5.1%)	9 (5.7%)	5 (3.2%)	11 (7.0%)	8 (5.1%)	7 (4.5%)	4 (2.5%)	1 (0.6%)	1 (0.6%)
Post calving recumbent cows	102 (65.4%)	13 (8.3%)	10 (6.4%)	21 (13.4%)	11 (7.0%)	9 (5.7%)	11 (7.0%)	10 (6.4%)	10 (6.4%)	7 (4.5%)
Total	156	21 (13.4%)	19 (12.1%)	26 (16.6%)	22 (14.0%)	17 (10.8%)	18 (11.5%)	14 (8.9%)	11 (7.0%)	8 (5.1%)

Table 2. Breed wise incidence of recumbent dairy cows

Recumbent dairy cows	Total No.	Breed		
		Jersey cross bred cow	Holstein Friesian Cross bred cow	Native breed cows
Pre calving recumbent cows	54 (34.6%)	44 (28.2%)	10 (6.4%)	-
Post calving recumbent cows	102 (65.4%)	65 (41.6%)	29 (18.6%)	8 (5.1%)
Total	156	109 (69.8%)	39 (25%)	8 (5.1%)

**Fig. 3. Age wise incidence of recumbent dairy cows**

Discussion

In this present study, the monthly distribution of the incidence of recumbent cow syndrome was higher during May month and lower during November month. Highest incidence in pre calving and post calving recumbent cows were noticed during June month and May month respectively. Similar finding was also reported by Senthilkumar (2016) who found that there is significant association between downer cow syndrome and season and reported highest risk during the summer. Soto *et al.* (2003) opined that the heat stress was a common condition predisposing dairy cattle to eat less and be more susceptible to recumbency and other metabolic diseases including ketosis and milk fever etc. Shortage of green fodder and heat stress in addition to specific etiological factors might be the reason for the increased incidence of metabolic diseases including downer cow syndrome during summer season (Senthilkumar, 2016). But this study was in contrast with Beder *et al.* (2020) found that the winter was the potential risk factor causing downer cow syndrome due to Poor exposure to adequate sunlight and subsequent improper vitamin D production increased the risk of developing

hypocalcaemia causing downer cow syndrome. Cox *et al.* (1986) who reported that the monthly distribution of downer cases indicated that most cases (39%) occurred during the three coldest months (December-February) while the lowest incidence (16%) was during the spring (April-June).

During the study period, the highest incidence of recumbent cow syndrome was noticed in Jersey cross bred cow (69.8%) followed by Holstein Friesian cross bred cows (25.0%) and native breeds (5.1%). Among them the highest incidence was observed in post calving Jersey cross bred cows. The study was supported by Sivaraman *et al.* (2019) who reported that Jersey cross bred cattle had highest incidence of recumbent cow syndrome followed by Holstein Friesian cattle in Veterinary College Hospital at Namakkal Tamil Nadu during the period 2015 to 2019. Similarly, Chiwome *et al.* (2017) observed that the incidence of recumbency due to milk fever in Jerseys (14.78%) was significantly higher ($p < 0.05$) than that in Holsteins (4.82%). Radostits *et al.* (2007) also stated that Jersey breeds were more susceptible for recumbency associated with parturient paresis than other breeds and

increased incidence in Jersey cows may be associated with the older age of the many Jersey cows. Goff (2008) explained this discrepancy by stating that Jersey cattle have lower intestinal calcitriol receptor concentrations than Holstein Friesian cattle. This higher incidences in jersey crossbred animals might be occurred in this study area due to increase in the population of Jersey crossbred animals by artificial insemination.

The higher incidence of recumbent cow syndrome was observed in cows with the age group of 6 to 8 years (41.6%), followed by the recumbent cows with age of 3 to 6 years (24.3%), recumbent cows with the age of above the 8 years (21.7%) and those cows with below 3 years (12.1%). This was in accordance with Hassan *et al.* (2020) who observed the highest incidence of recumbent cow syndrome in cows with five to seven years compared to those aged two to four years. It was also similar to the findings of Erb and Grohn (1988) who documented that the risk of a cow developing parturient paresis rises with age in multiparous animals. Sivaraman *et al.* (2019) reported that the highest incidence of recumbent cow syndrome is in cows with 4-5 years age group (23.92%) followed by cows with 3-4 years (18.71%) and 2-3 years (16.91%). This could be due to decreased ability obtain calcium from bone stores and thus a decline in the active transport of calcium in the intestine in aging animals. Ageing also leads to a decline in some of the 1,25 di hydroxy cholecalciferol receptors (Xu *et al.*, 2021). The animals of the present study were maintained in different feeding and husbandry management practices for different age group of animals and this may have attributed for the increase in incidence of recumbent cow syndrome in animals with the age of 3 to 8 years.

Conclusion

The study highlights the more incidence of recumbent cow in Jersey crossbred cow during summer season. Whereas the highest incidence also observed in cows with the age group of 6 to 8 years. These findings suggest a need for targeted management strategies, especially during specific months and for particular breeds and age groups, to mitigate the impact of this costly and challenging metabolic disorder in dairy farming. Further research and interventions are needed to elevate the region's individual circumstances which may contribute to improved dairy cow health and productivity among marginal dairy farmers of Tamil Nadu.

References

- Beder N.A., Elshafey, G.B.G., El-Khodery, S.A., and Nasr, M.Y. (2020). Prevalence and risk factors associated with downer cow syndrome at smallholder dairy farms in Middle Egypt. *Mansoura Vet. Med. J.*, 21(4): 189-192
- Chiwome B, Kandiwa E, Mushonga B, Sajeni S, Habarugira G. (2017). A study of the incidence of milk fever in Jersey and Holstein cows at a dairy farm in Beatrice, Zimbabwe. *J. S. Afr. Vet. Assoc.* 11;88(0): e1-e6.
- Cox, V. S., Marsh, W. E., Steuernagel, G. R., Fletcher, T. F., and Onapito, J. S. (1986). Downer cow occurrence in Minnesota dairy herds. *Preventive Vet. Med.*, 4(3), 249–260.
- Erb H.N and Grohn, Y.T. (1988). Epidemiology of Metabolic Disorders in the Periparturient Dairy Cow. *J. Dairy Sci.*, 71: 2557-2571.
- Goff, J.P. (2008). The monitoring, prevention, and treatment of milk fever and subclinical hypocalcemia in dairy cows. *Vet J.*, 176(1):50-7.
- Radostits, O.M., Gay, C.C., Hinchcliff, K., and Constable, P.D. (2007). *Veterinary Medicine. A Textbook of the Diseases of Cattle, Horses, Sheep, Pigs and Goats*, 10th edition. Saunders Elsevier, Philadelphia.
- Senthilkumar, V. (2016). Seasonal Influence on Metabolic Diseases Incidence Rate in Dairy Animals of Namakkal and Karur Districts of Tamil Nadu. *Shanlax Int. J. Vet Sci.* 4(2): 13-16.
- Senthilkumar, V., Safiullah, A.M., Kathiravan, G., Subramanian, M., and Mani, K., (2014). Estimated economic losses due to downer cow syndrome in Bovines in Tamil Nadu. *Shanlax Int. J. Vet Sci*, 2 (1): 11-14.
- Sivaraman, S., Vijayakumar, G., Balasubramaniam, G.A., Dharmaseelan, S., and Selvaraj, P. (2019). Incidence and etiology of recumbent cows in Veterinary College hospital at Namakkal Tamil Nadu during the period 2015 to 2019. *Int. J. Curr. Microbiol. App. Sci.*,8(9): 2936 – 2942.
- Soto, P., Natzke, R.P. and Hansen, P.J. (2003). Role of prostaglandin in the development of hyperthermia in heat stressed lactating Holstein cows. *Journal of Veterinary Pharmacology and Therapeutics*, 26: 435-437.
- Xu, H., Zhang, Q., Wang, L., Zhang, C., Li, Y., Zhang, Y. (2021). Effects of 25-Hydroxyvitamin D₃ and Oral Calcium Bolus on Lactation Performance, Ca Homeostasis, and Health of Multiparous Dairy Cows. *Animals (Basel)*. 28;11(6):1576.
- Yogeshpriya, S., P.Selvaraj, P.K.Ramkumar, K.Jayalakshmi and T.Arulkumar, 2019. Ionized calcium and electrolyte profile in a downer cows: A retrospective study of 50 cases (2016 – 2018). *Int. J. Livest. Res.*,9(3): 73-77.