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Prevalence of various disorders during Peri-parturient period in Gir cows in southern part of Rajasthan

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Abstract

The present study was conducted to find out the prevalence of various disorders during peri-parturient period. A total of 42 Gir cows falling under peri-parturient period were incorporated in the study. Out of 42 Gir cows, 47.61 percent were found affected with peri-parturient disorders. Among these 20 affected cows, 10 percent cows had mixed disorders although remaining 90 percent had single disorder. The disorders diagnosed in single disorder group in peri-parturient cows were post-parturient indigestion, sub-clinical hypocalcaemia, mastitis and retention of placenta. Whereas peri-parturient disorders present in mixed forms were milk fever and sub-clinical mastitis; and post-parturient metritis and lameness. Sub-clinical mastitis alone was observed in 9.52 percent cows, post-parturient indigestion and sub-clinical hypocalcaemia alone were observed in 7.14 percent cows each. Further, lameness, mastitis and post-parturient metritis alone were found in 4.76 percent Gir cows each. Milk fever and retention of placenta alone were observed in 2.38 percent cows each. In mixed peri-parturient disorders, milk fever and sub-clinical mastitis; and post-parturient metritis and lameness were observed in 2.38 percent cows each.

Keywords: Peri-parturient disorders, Gir, prevalence, dairy cows

Introduction

Gir is one of the most important indigenous milch breed of cattle. Gir originates from Gir forest of south Kathiawar in Gujarat and also found in adjacent parts of Rajasthan and Maharashtra. During the peri-parturient period, various physiological changes take place in the cow's body, leading to distinctive alterations in the metabolic profile (Puppel and Kuczynska, 2016) [18]. Physiological adaptations in dairy cows, happening over a short period, significantly contributes to various health problems and diseases. These include production-related diseases like milk fever, mastitis, and metritis, as well as metabolic disorders such as ketosis and hepatic lipidosis. During the peri-parturient period, dairy cows are more likely to have metabolic and production-related disorders, including milk fever, mastitis, fatty liver disease, ketosis, metritis, hypomagnesaemia and abomasal displacements (Mulligan and Doherty, 2008; McArt *et al.*, 2012; Ribeiro *et al.*, 2013) [15, 14, 20]. The dairy industry has experienced significant financial losses as a result of several diseases, most notably post-parturient conditions like metritis, mastitis, ketosis, milk fever and lameness. (Ametaj *et al.*, 2012) [2]. Many peri-parturient diseases are inter-related to each other such as ketosis, fatty liver, hypocalcaemia, hypophosphataemia etc. Cows that are overconditioned during dry period are more prone to ketosis and fatty liver. These conditions can reduce immunity of animal directly or indirectly by causing a negative energy balance (Ingvarstsen *et al.*, 2003) [7]. Earlier, the term "production disease" referred to major metabolic disorders in dairy cows, including hypocalcemia, hypomagnesemia and ketosis. However, the definition has been expanded to encompass conditions like retained placenta, abomasum displacement, metritis and laminitis (Mulligan and Doherty, 2008) [15].

Materials and Methods

Present study was carried out for six months of period and total 42 peri-parturient Gir cows were included in the present study. The animals belong to different locations in southern part of Rajasthan were examined for the presence of diseases during peri-parturient period.

Clinical Examination

Each Gir cows was subjected to thorough physical and clinical examination as per the methods stated by Radostitis *et al.* (2007) [19]. It included temperature, respiration rate and pulse rate, general appearance, behaviour, eating, drinking, defaecation, urination, posture, gait, body condition and body conformation. Visible mucous membranes, eyes, skin etc. were also examined. Auscultation of heart and lungs was done for each Gir cow.

Complete physical and clinical examination of the peri-parturient cow was conducted to diagnose any disorder or disease in these cows. Whenever required laboratory investigations such as California mastitis test and serum Ca estimation etc. were also carried out to diagnose sub-clinical condition.

Results and Discussion

Total 42 Gir cows were examined for various disorders during peri-parturient period. Out of these 42 peri-parturient Gir cows, 47.61 percent (20/42) were found affected with peri-parturient disorders (Table 1). Out of these 20 affected cows, 10 percent (2/20) had mixed disorders whereas remaining 90 percent (18/20) had single disorder. In mixed disorders, combinations of two types of disorders were found. The disorders diagnosed as single disorder in peri-

parturient cows included post-parturient indigestion (PPI), sub-clinical hypocalcaemia (SCH), mastitis and retention of placenta (ROP). Whereas, peri-parturient disorders present in mixed forms were milk fever and sub-clinical mastitis (SCM); and post-parturient metritis (PPM) and lameness.

Sub-clinical mastitis alone was observed in 9.52 percent (4/42) cows, post-parturient indigestion (PPI) and sub-clinical hypocalcaemia (SCH) alone were observed in 7.14 percent (3/42) cows each. Further lameness, mastitis and post-parturient metritis (PPM) alone were found in 4.76 percent (2/42) Gir cows each. Milk fever and retention of placenta (ROP) alone were observed in 2.38 percent (1/42) cows each. In mixed peri-parturient disorders, milk fever and sub-clinical mastitis (SCM); and post-parturient metritis (PPM) and lameness were observed in 2.38 percent (1/42) cows each.

In present investigation, out of various peri-parturient disorders sub-clinical mastitis (SCM) was recorded as the predominate disorder accounting for 11.90 percent (5/42) prevalence followed by lameness, post-parturient indigestion (PPI), post-parturient metritis (PPM) and sub-clinical hypocalcaemia (SCH) as 7.14 percent (3/42) each, mastitis and milk fever as 4.76 percent (2/42) each and retention of placenta (ROP) as 2.38 percent (1/42) (Table 2).

Table 1: Animal wise prevalence of various peri-parturient disorders in Gir cows

Sr. No.	Peri-parturient disorder	Total No. of cows	Percentage
1.	Sub-clinical mastitis	4	9.52
2.	Post-parturient Indigestion (PPI)	3	7.14
3.	Sub-clinical hypocalcaemia	3	7.14
4.	Lameness	2	4.76
5.	Mastitis	2	4.76
6.	Post-parturient metritis	2	4.76
7.	Milk fever	1	2.38
8.	Retention of Placenta	1	2.38
9.	Milk fever + Sub-clinical mastitis	1	2.38
10.	Post-parturient metritis + Lameness	1	2.38

Table 2: Total various individual peri-parturient disorders in Gir cows

Sr. No.	Peri-parturient disorder	Total No. of cows	Percentage
1.	Sub-clinical mastitis (SCM)	5	11.90
2.	Lameness	3	7.14
3.	Post-parturient Indigestion (PPI)	3	7.14
4.	Post-parturient metritis (PPM)	3	7.14
5.	Sub-clinical hypocalcaemia (SCH)	3	7.14
6.	Mastitis	2	4.76
7.	Milk fever	2	4.76
8.	Retention of Placenta (ROP)	1	2.38

Sub-clinical mastitis (SCM) was prevalent in 11.90 percent peri-parturient Gir cows. Higher prevalence of sub-clinical mastitis has been recorded by Sundrum *et al.* (2015) [22]. While comparatively lower prevalence of sub-clinical mastitis has been observed by Mandali *et al.* (2002) [13].

In present study, prevalence of lameness in peri-parturient Gir cows was 7.14 per cent. A similar prevalence has also been reported by Sundrum *et al.* (2015) [22]. Lower prevalence has been documented by Ribeiro *et al.* (2013) [20] (3.2 per cent).

Prevalence of post-parturient indigestion (PPI) in Gir cows was 7.14 percent in present study. Padmaja and Rao (2012) [16] have reported higher prevalence (28.13 per cent) of postparturient indigestion (PPI).

Post-parturient metritis (PPM) was prevalent in 7.14 percent animals. A similar finding has also been reported by Mandali *et al.* (2002) [13]; Abuom *et al.* (2012) [1] and Sundrum *et al.* (2015) [22]. While, Sepulveda-Varas *et al.* (2015) [21] revealed higher prevalence (41.1 per cent) of post-parturient metritis (PPM). Lower prevalence of post-parturient metritis (PPM) was noticed by Labernia *et al.* (1998) (3.7 per cent) and Ribeiro *et al.* (2013) [20] (5.3 per cent).

Sub-clinical hypocalcaemia (SCH) was prevalent in 7.14 percent peri-parturient Gir cows in the present study. Ribeiro *et al.* (2013) [20] (43.3 per cent) and Sepulveda-Varas *et al.* (2015) [21] (19.9 per cent) have reported higher prevalence than present study. Sundrum *et al.* (2015) [22]

found lesser prevalence rate (2.2 per cent) of sub-clinical hypocalcaemia.

Prevalence of mastitis in peri-parturient Gir cows in present study was 4.76 per cent. Almost similar findings have been reported by Curtis *et al.* (1985) ^[3]. Higher prevalence of mastitis was reported by Abuom *et al.* (2012) ^[1] (9.4 per cent) and Sepulveda-Varas *et al.* (2015) ^[21] (11.7 per cent); Sundrum *et al.* (2015) ^[22] (14.2 per cent); Ribeiro *et al.* (2013) ^[20] (15.3 per cent); Peeler *et al.* (1994) ^[17] (16 per cent); Kelton *et al.* (1998) ^[9] (16 per cent) and Ingvarsten *et al.* (2003) ^[7] (17.6 per cent).

The prevalence of milk fever in peri-parturient Gir cows was 4.76 per cent. A similar findings has been reported by Mandali *et al.* (2002) ^[13] (4.09 per cent); Ingvarsten *et al.* (2003) ^[7] (4.6 per cent) and Sepulveda-Varas *et al.* (2015) ^[21] (4.2 per cent). Jordan and Fourdraine (1993) ^[8] (7.2 per cent); Kelton *et al.* (1998) ^[9] (6.5 per cent) and Sundrum *et al.* (2015) ^[22] (6.5 per cent) reported higher prevalence of milk fever in peri-parturient cows.

Retention of placenta (ROP) was prevalent in 2.38 percent post-parturient Gir cows in the present study. The findings of the present investigation are in agreement with that of Ribeiro *et al.* (2013) ^[20]. While, Khan *et al.* (2016) ^[10] and Abuom *et al.* (2012) ^[1] observed the higher prevalence of retention of placenta (ROP) during post-partum period.

Peri-parturient disorders in dairy cows might be attributed to various factors such as reduced feed intake, negative energy balance, lipolysis and weight loss in early lactation, hypocalcaemia, hormonal and metabolic changes, immune suppression and bacterial invasion of the uterus in the transition period (Hammon *et al.*, 2006; Goff, 2008 and Leblanc, 2010) ^[6, 4, 12]. Retained placenta and metritis after calving both are indications of compromised immunity during the peri-parturient period. Subclinical and clinical illnesses and reproductive disorders during peri-parturient period might be attributed to the physiological, metabolic and nutritional changes in the transitional period (Ingvarsten *et al.*, 2003) ^[7]. Variation in the prevalence of peri-partum disorders could be due to difference in geographical location, animal production status and management factors.

Conclusion

The peri-parturient period is very crucial for dairy cow as well as for success of a dairy farm. During the peri-parturient period, dairy cows encounter significant stress as they transition from non-lactating to lactating. This transition period is characterized by various physiological changes, which result in notable shifts in their metabolic profiles which can trigger a cascade of health complications in dairy cows. Peri-parturient diseases such as mastitis, post-parturient metritis, indigestion, sub-clinical hypocalcemia etc. have been encountered during study and account for the huge economic loss to dairy farmers.

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