Short Communication

INFLUENCE OF LUNAR CYCLE ON OESTRUS LIKE CHARACTERISTICS AND FOLLICULAR BIOMETRY IN CROSSBRED CATTLE

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ABSTRACT

The study was conducted to document the incidence and nature of oestrus like signs and follicular biometry during the lunar and peri-lunar days in crossbred cattle. Crossbred cattle (n = 678) which were reported to be with oestrus like signs on lunar days (full moon day and new moon day) and peri-lunar days were subjected for the investigation. Only 60.6 per cent of the animals during the study period were in actual oestrus. The remaining animals (39.4%) were found to be in various reproductive statuses viz., pregnancy (17.7%), mid-cycle oestrum (6.9%) and without any oestrus characteristics (14.8 %). The diameter of the dominant follicle in cattle with oestrus signs during lunar days (10.4 ± 0.2 mm) was significantly (P < 0.05) smaller than cattle in actual oestrus during normal days (12.2 ± 0.5 mm). Exhibition of oestrous signs with smaller follicular diameter indicated the probable chances of lunar influence on the follicular dynamics, steroidogenesis and reproductive characters in cattle.

Keywords: Crossbred cattle, oestrus, lunar cycle

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Effects of lunar cycle on reproductive characters of farm animals are viewed as myth, however, belief on lunar days in relation to oestrus expression and breeding in dairy cattle still exists among the farming community. Effect of lunar cycles on the reproductive physiology of insects, fishes and lower vertebrates are sufficiently reported (Mikulecky and Bounias, 1997; Rahman *et al*., 2003, 2004; Takemura *et al*., 2004). However in higher mammals, even though the influence of season on breeding are well defined, the lunar influence on reproductive characters are discussed rarely. Hence the present study was conducted to document the incidence and nature of oestrus like signs and follicular

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biometry during the lunar and peri-lunar days in crossbred cattle. The study was conducted in the Gynaecology Unit of the Veterinary Clinical Complex, Veterinary College and Research Institute, Orathanadu during the period from January 2021 to March 2022.

The crossbred cattle which were reported to be with the history of oestrous like signs on lunar days (full moon day and new moon day) and peri-lunar days (one day prior and after these lunar days) *i.e.,* a total of six days in a month, were subjected for the investigation. A total of 678 animals were reported with oestrous like signs during these days of the study period. All the animals were subjected for ultrasonographic examination and based on the follicular and luteal biometry and uterine conditions, the reproductive status of the animals were determined (Satheshkumar, 2020). In addition, follicular diameter of oestrus animals during lunar days (n=91) was statistically compared (Snedecor and Cochran, 1994) with actual oestrus animals selected randomly during the other days of the month (n=50) to assess the influence of lunar days on the follicular biometry.

Ultrasonographic investigation of ovarian and uterine status revealed that only 60.6 per cent of the animals that were brought with oestrus like signs during the study period were in actual oestrus and considered fit for insemination. The remaining 39.4 per cent of animals were found to be in various reproductive statuses viz., pregnancy (gestational oestrum; 17.7%), dioestrum (mid-cycle oestrum; 6.9%) and without any oestrus characteristics (14.8 %).

Aguirre *et al.* (2021) demonstrated a bimodal pattern in Brahman cattle with greater frequencies of reproductive events occurring around the new moon and full moon, which coincides with the alignment of the sun, the moon, and the earth. Similarly, in our study we could observe that 24.6 per cent of crossbred cows which were pregnant or in dioestrus stage of the cycle could exhibit oestrus like signs during these lunar days. Hence, it is possible to speculate that this overt reproductive behaviours coinciding with the lunar days could be related to the transient increase in gravitational force and variations in the earth's electromagnetic field during these two periods of the lunar cycle, as suggested by Bevington (2015). They also reported that the increased reproductive activities co-incident with magnetic and lunar phases might depend on the high expressions of cryptochrome genes in the ovary. Influence of lunar clock on hypothalamo-pituitary-gonadal axis was also reported in lower animals and marine species (Rahman *et al*., 2003, 2004).

The diameter of the dominant follicle in cattle with oestrus signs during lunar days (10.4 ± 0.2 mm) was significantly ($P < 0.05$) smaller when compared to cattle in actual oestrus during normal days (12.2 ± 0.5 mm). The findings suggest that an altered steroidogenesis with increased oestradiol synthesis by dominant follicles of comparatively smaller diameter during lunar days. Based on the findings, we assume that an increase in aromatase activity would have accounted for changes in steroidogenesis (De los Reyes *et al.,* 2006). However, further detailed research must be conducted to

elucidate this phenomenon in farm animals. There were no previous reports in crossbred cattle to compare this data and hence to the best of our knowledge, it is the first report on follicular biometry in relation to lunar periods in crossbred cattle.

Another important observation in this study is that 14.8 per cent of the animals were brought for insemination without any signs of oestrus, which is a document for the dairy farmers' attitude to breed their animals on lunar days without observing the actual oestrous signs. This finding stressed upon the need for creating awareness among the dairy farmers regarding the reproductive management of dairy cattle.

From the present study, it is concluded that oestrus like signs occurred in nearly 25.0 per cent of crossbred cattle reported for insemination during the lunar days, which were not in actual oestrus. Further, exhibition of oestrous signs with smaller follicular diameter indicated the probable chances of lunar influence on the follicular dynamics, steroidogenesis and reproductive characters of farm animals.

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