ULTRASONOGRAPHIC STUDIES ON CENTRAL LUTEAL CAVITIES IN CROSSBRED DAIRY COWS*

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Abstract

With a view to study the disappearance of central luteal cavities of corpora lutea and its relation with conception rate in pregnant and non-pregnant animals, ultrasonographic studies were conducted in 16 crossbred dairy cows; 8 to 30 days post insemination. In both the groups, the luteal cavities were present on day 8 in all the animals at the commencement of the study except in three animals where luteal cavity was not found throughout the study. The study concluded that the luteal cavity disappearance was similar in both pregnant and non-pregnant animals and the mean day of disappearance in pregnant and non-pregnant animals were 16.44 and 15.55 days, respectively. The study also concluded that luteal cavities had no effect on conception rate of the animals

Key words: *Luteal cavity, disappearance, pregnant and non-pregnant, conception rate*

Fluid-filled central cavities within corpora lutea have been detected in studies utilizing excised ovaries. However, an accurate method for the sequential evaluation of the presence and size of these cavities was not available until the advent of high resolution transrectal ultrasound scanners. Such studies on luteal cavity in pregnant and non-pregnant animals are scanty. This study was undertaken to pinpoint the day of disappearance of luteal cavity in pregnant and non-pregnant animals and to assess its correlation with conception rate.

Materials and Methods

A total of 16 apparently healthy postpartum crossbred dairy cows were selected for the study. Detailed clinico-gynaecological

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examination was carried out in all selected animals to evaluate normalcy of cyclicity and rule out any pathological conditions. The body condition score (BCS) of all the animals was calculated as reported by Edmonson *et al*. (1989) on the day of oestrus. The areas observed were the thurl region, ischial and ileal tuberosities, ilio-sacral and ischio-coccygeal ligaments, transverse processes of the lumbar vertebrae and spinous processes of the lumbar vertebrae. An absolute body condition score was derived for each cow and the animals with a body condition score of three or above were selected for the study. All the animals were inseminated during the first observed oestrus after two months of calving. Trans-rectal ultrasonographic examination was performed from day 8 post insemination till day 30 on alternate days in all the animals for detecting the day of disappearance of the luteal cavity in both pregnant and non-pregnant animals.

Results and Discussion

Corpus luteum cavity in pregnant animals

Cavity inside the corpus luteum was present in 90 per cent of the animals by day 8 post insemination with mean cavity diameter of 7.63 mm, whereas, in one animal it was not detected throughout the study. Contrary to the present study Okuda *et al.* (1988) reported that central cavity was found only in 42.1 per cent (80/190) of developing corpora lutea, 33.7 per cent (126/374) of fully developed corpora lutea, 11.1 per cent (7/63) of corpora lutea in regression and in 5.1 per cent (4/79) of corpora lutea during pregnancy. The increased percentage of animals with corpus luteum cavities in the present study could probably be due to smaller sample size and high resolution of ultrasound scanner used for the study when compared to the study conducted by Okuda *et al.* (1988).

In the present study, cavity disappeared in all pregnant animals between day 10 and 24 of insemination (Fig. 1). Mean day of disappearance was 16.44 days. Similar observations were reported by Kastelic *et al.* (1990) who observed that the cavity in the corpus luteum disappeared by day 7 to 20. In this study the last day of disappearance of the cavity of one pregnant animal was on day 24 which was having a cavity diameter of 11.01 mm. Similar observations were seen in the work conducted by Kito *et al.* (1986) who observed that the cavities with more than 10 mm diameter took more than 21 days to disappear.

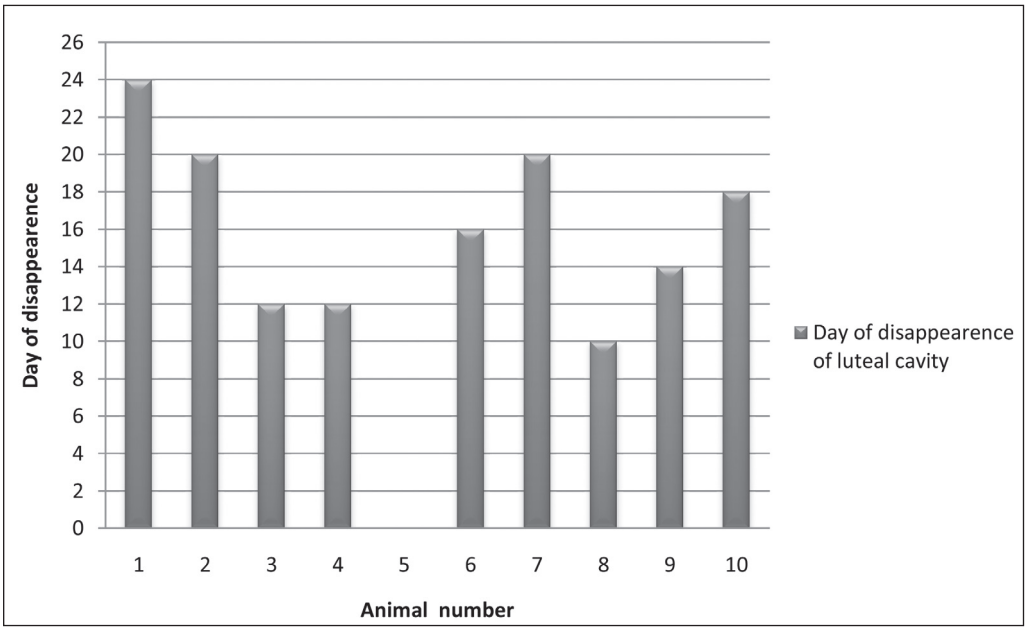

Fig. 1. Day of luteal cavity disappearance in pregnant animals

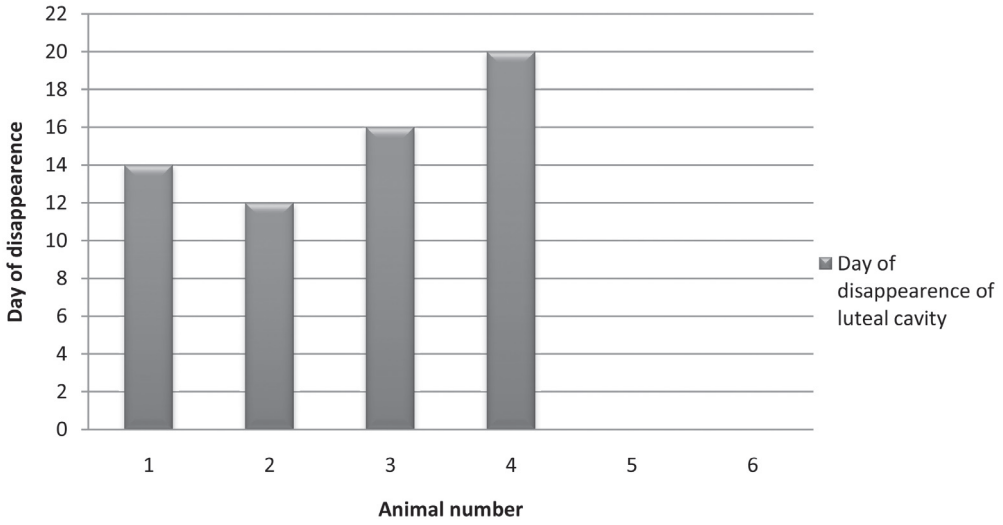

Fig. 2. Day of luteal cavity disappearance in non-pregnant animals

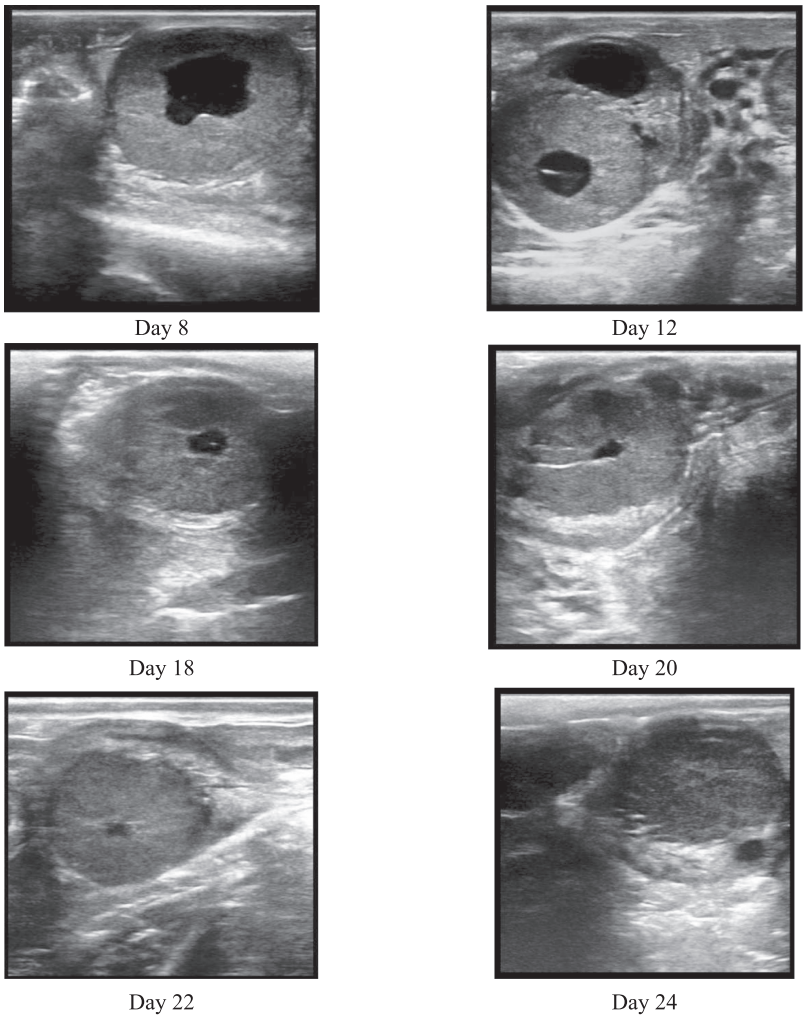

Fig. 3 Ultrasonogram of corpora lutea on different days depicting sequential disappearance of luteal cavities.

Corpus luteum cavity in non-pregnant animals

Cavity inside the corpus luteum was present in four (66.67 per cent) animals by day 8 post insemination, while in two animals cavity was not detected throughout the study. Perez-Marin (2009) reported that fifty per cent of the cows under the study displayed luteal cavity and author also reported that cavity disappeared on an average of 8 to 12 days after formation. Garcia and Salaheddine (2000) also reported that incidence of luteal cavity was 37 to 41 per cent in cyclic cows. The increase percentage of animals with CL cavities in the present study could probably be due to the smaller sample size and high resolution of ultrasound scanner used for the study compared to other works.

In the present study CL cavity disappeared between days 12 to 20 in all the animals under study (Fig. 2 and Fig. 3). Mean day of disappearance was 15.55. Similar observations were recorded by Kastelic *et al.* (1990) who observed that the cavity in the corpus luteum was detected and disappeared between 0 to 17 days.

Relationship between central luteal cavity and conception rate

From the study, it was clear that luteal cavities had no effect on conception rate of the animals. Luteal cavity was seen in 12 out of a total of 16 animals and in three animals luteal cavity was not detected throughout the study. Eight of twelve animals with cavities conceived (66.67 %) which was not in agreement with the observation of Howell *et al.* (1994) who reported that presence of central luteal cavity reduced the conception rate in cows. However, the present study observations were in accordance with Kastelic *et al.* (1990) who observed presence of luteal cavities had no effect on the conception rate of cows.

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