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A comparison of rectal palpation and ultrasonography for the detection of follicle(s) and corpus luteum in pluriparous buffaloes

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ABSTRACT

Six normal cycling pluriparous buffaloes were examined by palpation per rectum and by ultrasonography to find the comparative detectability of follicle and corpus luteum (CL) during different stages of estrous cycle. The ovaries of these buffaloes were palpated and scanned at estrus (day 0), metestrus (day 2), mid-diestrus (day 9) and late-diestrus (day 16). The follicles were palpated in four (66.67 %) out of six buffaloes at estrus by per rectal palpation and in all the six (100%) by ultrasonography. The mean size of follicle at estrus detected by ultrasonography was 1.08 ± 0.21 cm. The CL on days 2, 9 and 16 was detected by ultrasound in all the buffaloes (100%) and in three (50 %), six (100%) and one (16.67%) buffaloes by palpation per rectum, respectively. The mean size of CL as measured by ultrasound was 0.89 ± 0.09, 1.17 ± 0.17 and 0.80 ± 0.07 cm on day 2, 9 and 16, respectively. The identification and measurement of follicles and CL were easier by ultrasonography than by palpation as follicles and CL measuring less than 0.90 cm were not detected by palpation most of the times.

Key words: Ultrasonography, corpus luteum, follicle, estrous cycle

Rectal palpation of ovaries is the conventionally used technique. Diagnosis of ovarian structures by rectal palpation is not possible in about 20 per cent of cases (Grunert and Berchtold 1982) and it can be wrong with only one examination (Dawson 1975, Horning 1978). For proper diagnosis of reproductive status of an animal, correct picture of ovarian structure is essential. Compared to manual palpation ultrasonography permits a more precise estimation of the number as well as size of follicle and corpus luteum (Hanzen *et al.*, 2000). Therefore, the present experiment was undertaken to study the comparative detectability of follicle and CL by palpation per rectum and ultrasonography during different stages of estrous cycle.

MATERIALS AND METHODS

The experiment was carried out on six normal cycling pluriparous buffaloes maintained at Dairy Farm, Department of Animal Breeding and Genetics, Punjab Agricultural University, Ludhiana. Estrus detection was carried out by parading a vasectomized bull. The ovaries of these buffaloes were examined by per rectal palpation, followed by ultrasonography at estrus (day 0), met estrus (day 2), mid diestrus (day 9) and late diestrus (day 16). The size and echogenicity of various ovarian structures were recorded by ultrasonography. Each ovary was palpated per rectally as described by Settergren (1980), for the presence of any structure viz. follicle, corpus luteum (CL), follicular or luteal cyst, adhesions etc. The ultrasonographic examinations were made with a B-mode ultrasound scanner (Pie medical, Scanner 200) equipped with inbuilt interchangeable 5/7MHz linear-array rectal transducer. Each ovary was scanned using 5MHz frequency in several planes by moving the transducer along its surface to identify the ovarian structures. Maximum observed size (diameter) of follicle and CL in cm was recorded and representative images were printed with a thermal printer (Sony; Video Graphic UP-890MD).

RESULTS AND DISCUSSION

The follicles were detected in four (66.67 %) out of six pluriparous buffaloes at estrus by per rectal palpation and in all the six buffaloes (100%) by ultrasonography. The mean size of follicle at estrus detected by ultrasonography was 1.08 ± 0.21cm. The follicles were also detected by ultrasonography in 83.33 and 100% buffaloes during mid and late diestrus phase, as compared to that in 33.33 and 66.67 % buffaloes by palpation

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per rectum, respectively. The mean sizes of follicles were 0.85± 0.19 and 0.99 ± 0.17 cm during the mid and late diestrus, respectively. The follicles of more than 0.88 cm size were easily identified by palpation per rectum. Manual diagnosis of follicle less than 10 mm size might be inaccurate (Hanzen *et al.*, 2000), explained the non-detection of smaller sized follicles by palpation per rectum. Ultrasonography was more accurate method for identifying and measuring the follicles than by rectal palpation which is in accordance with the findings of Pierson and Ginther (1984, 1988), Edmondson *et al.* (1986), Kahn and Leidl (1986), Ribadu *et al.* (1994) reported in cattle.

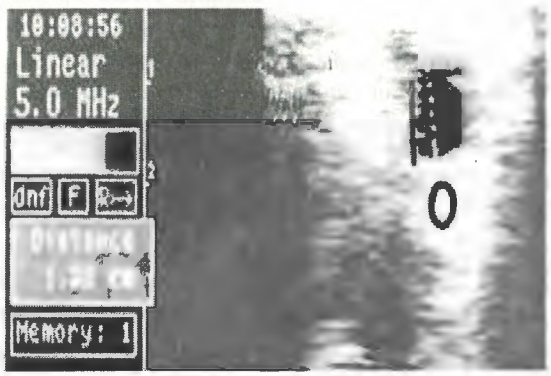
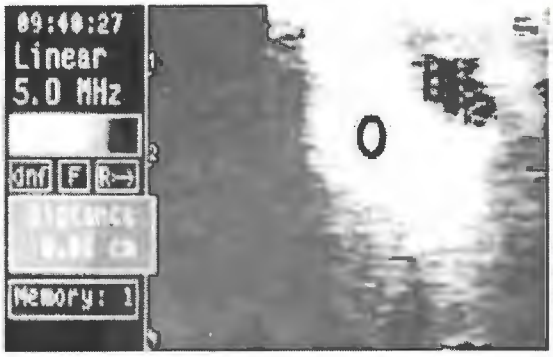


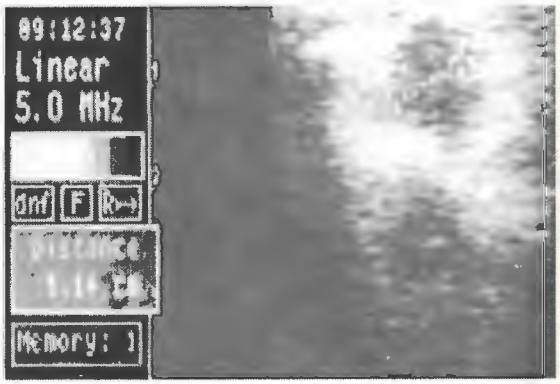
Fig.1. Ultrasonographic characteristics of follicle and CL.
A. Estrus (Day 0): ovary showing dark anechoic (black) follicle (F) surrounded by hyperechoic white area of stroma (o).

The follicles appeared as a dark anaechoic black structure surrounded by hyperechoic border of ovarian stroma (Fig.1A). The mean size of the follicle at estrus was more than those follicles detected at other stages of the estrous cycle. Difference in size though non-significant might be due to the preovulatory LH surge, which helps in final growth and maturation of follicle.

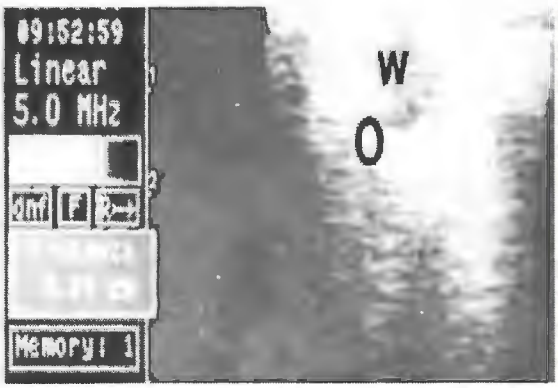
Out of six pluriparous buffaloes the CL was detected in three (50%), six (100%) and one (16.67%) buffaloes on days 2, 9 and 16, respectively by palpation per rectum and in all the buffaloes (100%) by ultrasound on all the corresponding days. The mean size of CL as measured by ultrasound were 0.89 ± 0.09, 1.17 ± 0.17, 0.80 ± 0.07 cm on respective days. The ultrasonic image of CL on day 2 was poorly defined irregular and greyish black structure (Fig.1B). The mid-cycle CL (day 9) was well-defined, granular, greyish, echoic structure with a demarcation line visible between it and ovarian stroma (Fig 1C). On day 16 the CL was greyish white and its demarcation with ovarian stroma was faint due to slight difference in



B. Metestrus (Day 2): CL appearing as greyish black structure (b) with hyperechoic ovarian stroma (o).



C. Mid diestrus (Day9): CL appearing as granular greyish echoic structure (g)



D. Late diestrus (Day16): CL appearing as greyish white structure (w) with its poor demarcation with stroma (o).

echogenicity between the tissues (Fig. 1D). Ultrasonography was found to be more accurate than palpation per rectum in identifying the CL.

Though, per rectal palpation is cheap and most preferred technique but ultrasound seems to be a more reliable and accurate method for detection of follicle and CL.

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