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COMPARATIVE EFFICIENCY OF RECTAL PALPATION AND MILK PROGESTERONE PROFILES IN DIAGNOSING OVARIAN CONTENTS IN BUFFALOES

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ABSTRACT: Comparative efficiency of rectal palpation and milk progesterone profiles in diagnosing ovarian contents was studied in Nili-Ravi buffalo. One hundred lactating buffaloes were randomly selected, ovaries were palpated per rectum and progesterone concentrations in milk samples were determined using enzyme immunoassay (EIA) technique. Post-slaughter examination of ovarian contents was used for the confirmation of rectal and EIA diagnosis of ovarian contents. Twelve of the 122 rectal diagnoses (9.84%) of corpus luteum (CL) were false positive and 8(6.55%) were false negative, the overall accuracy being 83.61%. The EIA technique gave 8% false positive and 8% of false negative diagnosis with an overall accuracy of 84%. The difference between accuracy of rectal and EIA diagnosis of CL was not significant. Agreement between the two methods was good, being 71% for buffaloes with a CL, 31.4% for animals lacking CL and 78% overall.

Key Words: Bubalus bubalis; Rectum; Milk; Progesterone; Ovarian Content; Pakistan.

INTRODUCTION

The gap between supply and demand for milk and meat products is widening. In a recent livestock sector study it has been reported that total milk production is 9.2 mt (FAO, 1986). Buffalo contributes roughly 70% of the total milk from a herd estimated as 4 million females in milk. The water buffalo (*Bubalus bubalis*) has remained the world most neglected domestic animal with a notable potential for meat and milk production (Cockrill, 1978).

The reproductive efficiency of Nili-Ravi buffalo is adversely effected by post-partum anoestrus. Rectal palpation of corpus luteum (CL) is a simple and economic way of studying the ovarian function. An accurate diagnosis of a CL in the buffalo provides the basis for the successful induction of oestrus with prostaglandins (Jainudeen, 1976). In most studies luteal activity was inferred from either the presence of palpable CL on rectal examination or cyclic levels of progesterone in blood (Perera et al., 1978; Kamonpatana et al., 1975, Joyce et al., 1978).

Jainudeen et al. (1983) studied the relationship of ovarian contents to plasma progesterone concentration during the oestrous cycle, early pregnancy and post-partum periods in the swamp buffalo (*Bubalus bubalis*) using rectal palpation and laparoscopy. The accuracy of diagnosing ovarian contents was 82% and 91% on rectal palpation and plasma progesterone levels, respectively. Sharifuddin and Jainudeen (1983) determined the accuracy of rectal diagnosis of CL by

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direct inspection of the ovaries by laparoscopy in 68 suckled water buffaloes. The overall accuracy of diagnosing a follicle or a CL by rectal palpation and plasma progesterone assay was 81% and 86%, respectively. The study indicated that rectal palpation is as reliable as the progesterone assay for the diagnosis of CL in the buffalo.

Usmani et al. (1985) studied uterine involution and postpartum ovarian activity in 53 Nili-Ravi buffaloes. Mean interval to formation of first CL after calving as indicated by progesterone in plasma (>1.5 ng/ml) was 23.8 ± 1.7 days, but only 52% of the CL were palpable. Ott et al. (1986) used serum progesterone concentration to check the accuracy of rectal palpation of corpora lutea as a method in assignment of postpartum beef cows to groups requiring and not requiring prostaglandin treatment.

Stupnicki et al. (1986) studied the relationship between the concentration of progesterone in plasma and the corpus luteum in late postpartum cows, and heifers at slaughter. The data suggested that plasma level depends on the amount of progesterone in the luteal tissue present, rather than on the luteal concentration of this hormone.

The present study was conducted to see the comparative efficiency of rectal palpation and milk progesterone profiles in diagnosing ovarian contents in Nili-Ravi buffalo.

MATERIALS AND METHODS

One hundred adult Nili-Ravi buffaloes were randomly selected for this study from the slaughter house of Municipal Corporation, Peshawar. Most of the animals were at the end of lactation period. Reproductive history of the animals was not known. The cows were palpated per rectum for the measurement of CL when present. Both the ovaries were palpated for comparative size and presence of ovarian structures. The consistency of CL was classified as soft, firm or hard as described/classified by Sharifuddin and Jainudeen (1983).

Milk samples were collected from individual cows on the day of rectal diagnosis of CL. One ml of whole milk was collected in vials, thimerosal (0.05% w/v) was added as a preservative. The milk samples were analysed for progesterone at EIA laboratory of the Veterinary Research Institute, NWFP, Peshawar, using the procedure previously described by Shah et al. (1987). This technique is used for the measurement of progesterone in bovine milk and blood plasma employing polyclonal antibodies against P-7 corboxyethylthioether-BSA as the antigen. The sensitivity is 20 times greater than RIA and has a detection limit of 0.4 pg/ml.

On the same day the ovaries were examined for the presence of CL or graffian follicle (GF) after slaughter of the animal. The ovary was cut to examine the deeper portion of CL or GF. The presence or absence of CL or GF in the ovary observed after slaughter was used as criterion for the confirmation of both rectal diagnosis and the prediction of luteal tissues.

The accuracy of each method was expressed as a percentage of the diagnosis made by rectal palpation or progesterone assay which were confirmed by post-slaughter examination. The following

formula was used:-

$$\%\text{Accuracy} = \frac{\text{No. of diagnosis confirmed post-slaughter x 100}}{\text{Total number of diagnosis made}}$$

Evidence of the luteal tissues in buffalo was based on a plasma progesterone level greater than 0.7 ng/ml (Jainudeen et al., 1983). Difference between accuracy of the two methods was determined for the buffaloes with a CL, animals lacking CL and overall.

RESULTS AND DISCUSSION

Rectal Palpation

Ninety four (88.7%) of the 106 CL diagnosed positive and 8(50%) of the 16 CL diagnosed negative per rectum were confirmed post-slaughter. Twelve of the 122 rectal diagnosis (9.84%) were false positive and 8(6.56%) were false negative. Overall accuracy of rectal diagnosis of CL was 83.61%. The results are in agreement with Jainudeen et al. (1983), who reported the accuracy of diagnosing ovarian contents after laparoscopic confirmation as 82% and Sharifuddin and Jainudeen (1983) who found it 81% in swamp buffaloes but Dawson (1975) found it to be 89% after post-slaughter confirmation in a study on cattle.

The accuracy observed here is slightly higher than that of Boyde and Munro (1979) who found it to be 80% based on plasma progesterone level and more than that of Watson and Munro (1980), who found it to be 70% based on milk progesterone level in cows. The variations are not much wide and may be due to the difference in the methods of confirmation used in each experiment.

The false positive diagnosis was due to mis-diagnosis of a palpable mature follicle as a CL and the false negative diagnosis was due to the totally embedded CL leaving no palpable structure on the surface of the ovary.

Milk Progesterone Assay

Milk progesterone level was more than 0.7 ng/ml in 84 animals predicting the presence of luteal tissue out of which 76(90.5%) were confirmed by the presence of CL in post-slaughter examination of the ovary. The progesterone assay predicted an absence of luteal tissue (Progesterone < 0.7 ng/ml) in 16 animals but only 8 animals (50%) had no CL on post-slaughter examination. Eight percent were false negative. The overall accuracy of EIA diagnosis of CL was 84%.

The results agree with Sharifuddin and Jainudeen (1983), who found the accuracy of diagnosing CL in buffaloes by plasma progesterone assay to be 86%. The accuracy is however, lower than that determined by Jainudeen et al. (1983) in swamp buffaloes.

The false negative diagnosis of CL by EIA technique was due to the well developed CL failing to secrete progesterone. A similar situation was observed by Jainudeen et al. (1983) in swamp buffalo, Haresign et al. (1975) after LH-RH treatment for anoestrus in ewe and Webb et al. (1977) in suckled beef cows. The false positive diagnosis of CL by EIA was with elevated progesterone level having neither CL nor ovarian abnormalities such as follicular or luteal cysts. It was probably due to totally embedded luteal tissues in the ovary.

Difference between Accuracy of EIA and Rectal Diagnosis

The difference between accuracy of rectal diagnosis of CL and EIA technique

was found to be non-significant statistically (Z = 0.08). This is in agreement with Sharifuddin and Jainudeen (1983), who found the difference non-significant (X^2 = 0.82), when subjected to Chi-square analysis.

Agreement between the Two Methods

Agreement between rectal palpation and milk progesterone assay for the presence of CL was found in 71% buffaloes with a CL; 31.4% of animals lacking CL and 78% of the buffaloes overall. The results agreed with Boyde and Munro (1980) who found the overall agreement of 77% between the two techniques but not with Vande Wiel et al. (1979) who found it to be 93%. Usmani et al. (1985) could palpate only 52% of the CL formed after calving as indicated by plasma progesterone (> 1.5 ng/ml) in 53 Nili-Ravi buffaloes.

Moreover, Watson and Munro (1980) found the agreement of 84% between the two methods with a CL, 69% without a CL and 77% overall. The observations in the current study confirm that the technique of rectal palpation to detect CL gives a good indication of the functional presence of such a structure on the ovaries.

It is concluded that rectal palpation of ovarian contents is as reliable as a progesterone assay. The former is a cheap and economical method and provides an immediate assessment of the cyclic status of the buffaloes. However, rectal palpation method lacks the ability to identify fully embedded CL or newly developing luteal tissues secreting progesterone. Such luteal structures can be detected with EIA technique.

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