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Mensuration of Genitalia of Post-Partum Anestrous Murrah Buffaloes

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A B S T R A C T

The mensuration of genitalia studied in 16 postpartum anoestrous murrah buffaloes at Dairy farm of Punjab Agriculture University in the year 2003. The buffaloes were divided randomly in three groups. Group-I Control without any therapy, Group-II received Progesterrone therapy and Group-III received Progesterone and PMSG therapy. The ultrasonographic luminal diameter of cervix was significantly bigger (P<0.05) in Group-III (1.67±0.051 cm) as compared to that of Groups-I (1.27±0.052 cm) and II (1.26±0.038 cm) buffaloes. Similarly, mean luminal diameter of uterine body was significantly greater (P<0.05) in Group-III (1.47 ± 0.037 cm) as compared to that of Group-I (1.28±0.038 cm) and II (1.27 ± 0.034 cm) buffaloes. Overall mean luminal diameter of uterine horn and size of ovaries varied between 1.13±0.045 and 1.23±0.022 cm and 2.16±0.029 to 2.39±0.005 cm in buffaloes respectively.

Introduction

According to 19th livestock census 2012, buffalo plays a significant role in the economy of India by providing milk, meat and draught power. More than half of the world population of buffalo is housed in India.True-anoestrus is the most common cause of infertility in buffalo mainly caused by high ambient temperature, nutritional deficiency, poor management system and hormonal disturbances (Agrawal 2003). Normal size and texture of genitalia is essential for optimal reproductive performance of the animal. Changes therein due to various physiological or pathological conditions may affect the functional status. Pathological lesions such as congenital abnormalities, tumors, cysts and inflammatory conditions alter the shape and performance of genitalia (Sane *et al.*, 1964), the exact knowledge of which is essential for undertaking corrective measures to optimize the reproductive performance. The ultrasound is a simple, reliable, non-invasive imaging technique without any side effects (Giuseppina, 2012). It's applications in veterinary practice has developed from a limited use for pregnancy diagnosis and detection of some pathological conditions like hydrometra or metritis, reproductive management of the herd (Giuseppina, 2012). Its use in ruminant reproduction like

measuring genitalia in cyclic buffaloes (Agrawal and Tomar, 1998) and (Parkhe *et al.*, 2004) and understanding of follicular dynamics (Baruselli *et al.*, 1997; Manik *et al.*, 1998), embryo production (Kitiyanant *et al.*, 1995) and fetal development (Pawsche *et al.*, 1994) in buffaloes have advanced our understanding in this area. However, such information was lacking in postpartum anoestrous buffaloes. In the present study, we tried to provide an overview of measurement of size of genital organs of postpartum anestrous buffaloes.

Materials and Methods

Study was performed on16 postpartum healthy anoestrous Murrah buffaloes maintained at uniform condition and of standard feeding schedule of Dairy Farm, Punjab Agricultural University, Ludhiana in 2003. The animals were divided in Group-I(Control group-n=5) Group-II (Progesterone therapy group, n=6)- those were administered 750 mg hydroxy progesterone hexanoate BP (Pregneforte®, Venus Remedies Limited, Panchkula, Haryana, i.m.) on days 1, 4 and 7 of the experiment & Group-III (Progesterone + Pregnant Mare Serum Gonadotrophin therapy group, n=6)- those were administered hydroxy progesterone hexanoate BP injection as in Group-II followed by 750 IU PMSG (Folligon®, Intervet (India) Private Limited, Hyderabad, i.m.) on day 10 i.e. 72 h after 3rd injection of progesterone.

Ultrasound examination

The measurement of genital organs made by a real time B-mode ultrasound scanner (Concept MCV, dynamic imaging, Scotland, U.K.) equipped with interchangeable 5/7.5 MHz linear-array rectal transducer without using of any drug in animals. The rectum was back racked before performing measurements of genitalia (Savio *et al.*, 1988, Stagg *et al.*, 1995 and Parkhe *et al.*, 2004) in the following ways-

Part of the genitalia - Observation site

Cervix - Middle

Body of uterus - Anterior to internal os

Uterine horns - at the level of bifurcation

Ovaries - Anterior to posterior pole

The size of the lumen which appeared dark, anechoic area was measured using inbuilt electronic calipers after freezing the image.

Statistical analysis

The means of size of ovaries, uterine horns and cervix in various groups were compared each other using Student's t-test with the level of significance at $P<0.05$ (Singh *et al.*, 1991).

Results and Discussion

Cervix

The luminal diameter of cervix was significantly bigger ($P<0.05$) in Group-III (1.67±0.051 cm) as compared to that of Groups-I (1.27±0.052 cm) and II (1.26±0.038 cm) buffaloes. Our findings are similar to that reported by Honparkhe *et al.*, (2004). However, Agrawal and Tomar (1998) recorded slightly greater diameter of cervix (2-4 cm).Similarly, in African zebu heifers and cows it is observed more than 3 cm diameter of cervical lumen (Bello *et al.*, 2012).

The size of cervix varied with the stage of reproductive cycle and parity of the animal (Zemjanis, 1970 and Roberts, 1971). There is increased vascular development and oedema of genital organs as a result of high oestradiol concentration at oestrus (Garverick *et al.*,

1971 and Roberts, 1971). This might explain the observed significantly bigger size of cervix in Progesterone +PMSG treated buffaloes as four buffaloes became cyclic in this Group.

Body of uterus

The luminal diameter of uterine body was significantly greater (P<0.05) in Group-III (1.47 ± 0.037 cm) as compared to that of Groups-I (1.28±0.038 cm) and II (1.27 ± 0.034 cm) buffaloes. The size of body of uterus in the present study is in agreement with the finding of Agrawal and Tomar (1998) and Honparkhe *et al.,* (2004).

Resumption of cyclicity in the Progesterone +PMSG treated buffaloes may be accountable for the significantly bigger size of body of uterus in Group-III as compared to that in Groups I and II buffaloes.

Uterine horn

Overall mean luminal diameter of uterine horn varied between 1.13±0.045 to 1.23±0.022 cm in all the buffaloes. There was no significant variation between the size of left and right uterine horn of the buffaloes in different groups. Also, the size of left and right uterine horn varied non-significantly among the Groups. Honparkhe *et al.,* (2004) observed the mean size of left and right uterine horn was 1.64±0.037 and 1.73±0.036 cm, respectively in cycling buffaloes. He found significant (P<0.05) smaller size of right horn during late diestrus as compared to that in estrus (1.40±0.21 to 1.68±0.30 vs 1.80±0.28 to 2.00±0.47 cm). The comparable size of left and right uterine horn has been recorded by Bhalla *et al.,* (1964) and Sane *et al.,* (1964). The variation in the size of uterine horn may occur due to parity (Roberts, 1971).

Table.1 Size of tubular genitalia and ovaries (cm) (Mean ±SE) in anestrous buffaloes

Genitalia	Group I (n=5)	Group II (n=5)	Group III (n=6)
Cervix	1.27±0.052[a] (1.14 – 1.44)	1.27±0.038[a] (1.17 – 1.38)	1.67±0.051[b] (1.49 – 1.77)
Body of uterus	1.28±0.038[a] (1.24 – 1.44)	1.27±0.034[a] (1.18 – 1.35)	1.45±0.037[b] (1.35 – 1.57)
Horns			
Left horn (Lh)	1.13±0.047 (0.99 – 1.29)	1.07±0.022 (1.02 – 1.14)	1.23±0.023 (1.18 – 1.32)
Right horn (Rh)	1.13±0.044 (0.98 – 1.31)	1.08±0.011 (0.99 – 1.15)	1.22±0.021 (1.17 – 1.23)
Overall (Lh + Rh)	1.13±0.045 (0.98 – 1.31)	1.07±0.016 (0.99-1.15)	1.23±0.022 (1.17-1.32)
Ovaries			
Left ovary (LO)	2.19±0.022 (2.12 – 2.35)	2.35±0.034 (2.15 – 2.46)	2.38±0.033 (2.22 – 2.54)
Right Ovary (RO)	2.13±0.026 (2.04 – 2.31)	2.18±0.026 (2.12 – 2.38)	2.39±0.046 (2.18 – 2.89)
Overall (LO+RO)	2.16±0.029	2.27±0.034	2.39±0.005

Value with different superscript within the same rows shows significant difference (P<0.05).Values in parenthesis indicate range.

Ovaries

Overall mean size of ovaries was 2.16±0.029, 2.27±0.034 and 2.39±0.005 cm in Groups-I, II and III buffaloes, respectively. No significant differences (P>0.05) in the mean size of left and right ovaries were found in between and within the Groups of buffaloes (Table 1). Similar size of the ovaries have been recorded by Sane *et al.*, (1964), Honparkhe *et al.*, (2004), Khaton *et al.*, (2015) and Parkale and Hukeri (1989).

In the present study, the luminal diameter of cervix and uterine body were significantly bigger in Group-III as compared to that of Group-I and II buffaloes. However, no significant different were found in overall mean luminal diameter of uterine horns and mean size of ovaries in different groups of buffaloes.

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