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EFFECT OF PROSTAGLANDIN F2 a ON THE EXPULSION
OF THE PLACENTA, AND THE INTERVAL FROM
BIRTH TO THE FIRST POSTPARTUM
ESTRUS IN BUFFALOES*.

(With 2 Tables)

By

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تأثير البروستاجلاندين ف2 الفا على نزول
الأغشية الحمليّة وكذلك الفترة
من الولادة وحتى ظهور
أول أعراض شبق

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أجريت هذه الدراسة لبيان تأثير البروستاجلاندين ف2 الفا الذى تم حقنه فى العضل بعد
الولادة الطبيعى بوقت قصير على الوقت اللازم لنزول الأغشية الحمليّة وكذلك المدة من الولادة
حتى ظهور أعراض أول شبق .

أجريت هذه التجربة على عدد 40 جاموسه 30 منها تم حقنها فى العضل بجرعة واحدة 25 مجم
من البروستاجلاندين ف2 ألفا بعد الولادة الطبيعى بوقت قصير و 10 أخرى تم حقنها بمحلول الملح
وهى تمثل المجموعه الضابطه .

تراوحت أعمار الجاموس المستخدم فى الدراسة بين 7 - 12 سنه .

أظهرت النتائج ان البروستاجلاندين ف2 الفا له فاعليه كبيره على الوقت اللازم لنزول الأغشية
الحمليّة حيث كان متوسط الفتره اللازمه لنزول المشيمه فى المجموعه الضابطه والمعالجه (9.8
+ 1.84 ، 4.8 + 2.8 و ساعه على التوالى) .

بالنسبه لتأثير البروستاجلاندين ف2 الفا الذى تم حقنه بعد الولادة الطبيعى بوقت قصير
على الوقت اللازم بعد الولادة لظهور أعراض أول شبق . وجد أنه فى الجاموس المعالج ظهرت
أعراض أول شبق بعد الولادة أسرع منه فى الجاموس الضابط (3 ر 9.2 + 4.8 ، 4.4 + 8.4 ، يوم
للمجموعه الضابطه والمعالجه على التوالى)

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SUMMARY

The present study was carried out to investigate the effect of PGF $_{2\alpha}$ injected shortly after normal parturition in buffaloes on the time needed for placental drop, and the interval from birth to the first postpartum estrus. The experiment was performed on 40 buffalo-cows (30 treated+ 10 control), aged from 7-12 years old at Monofia province. Treated buffaloes received a single i.m. injection of 25.0mg Lutalyse shortly after calving and the control were injected with saline. PGF $_{2\alpha}$ shortened significantly ($P < 0.05$) The time elapsed from calving till the spontaneous release of the fetal membranes (9.8 ± 1.84 and 4.8 ± 0.28 hrs) for the control and treated buffaloes respectively. PGF $_{2\alpha}$ injection early in the postpartum period in buffaloes resulted in a highly significant ($P < 0.01$) decrease in the period elapsed from calving until the first postpartum estrus (92.3 ± 4.52 and 43.0 ± 0.84 days) for the control and treated buffaloes respectively.

Keywords: Prostaglandin F $_{2\alpha}$ placenta, estrus, buffaloes.

INTRODUCTION

The normal mechanism of fetal membranes drop included the following: The vessels of the fetal placenta collapsed, the villi shrunken and the uterus still contracted strongly for about 48 hr after birth and less vigorously but more frequently, these changes with reducing the amount of the blood circulating in the endometrium reduced the haemorrhage and aided in forcing the fetal membranes into the birth canal (JORDAN, 1952 and GILLETTE and HOLM, 1963). The mean time taken for expulsion of the placenta in multiparous buffaloes was 4.17 ± 1.21 hrs but buffalo-heifers required an average of 4.56 ± 0.72 hrs. (GUDI et al., 1971) who also reported that, the time needed for expulsion of the placenta during the different months of the year was 4.25, 5.09, 4.22, 4.22, 4.59 and 4.40 hrs in March through August months respectively. They added that early calved buffaloes could expell their placenta in 4.29 hours postpartum while the later ones expelled their placenta in 4.53 hrs after birth. They further added that the time needed for expulsion of the placenta might be affected by the sex of the new born. This time averaged 4.75 and 4.39 hrs after

calving of the female and male fetuses respectively. Finally they found a non significant difference existed in the time of expulsion correlated to the day time of giving birth. *HERSCHLER and LAWRENCE (1984)* reported rapid expulsion of the retained fetal membranes in cows treated with 1 or 2 mg PGF_{2α} (fenoprostalene) than in the control animals. *EL-AZAB *et al.* (1988)* found that, the time of retained fetal membranes was reduced when cows were injected with 5 ml of PGF_{2α} (Lutalyse) just after parturition and the mean length of time from parturition to placental release was 5.3 hrs for the control and 4.4 hrs for the PGF_{2α} treated cows. *FATTOUH *et al.* (1990)* injected 15 buffalo-cows with 25.0 mg PGF_{2α} (Lutalyse) as a single i.m. dose just after parturition and found that, the mean duration from birth till drop of the fetal membranes was 4.48 hrs for the PGF_{2α} treated buffaloes compared with 10.0 hrs for the control group.

*YOUNG *et al.* (1984)*; *TINDALL (1984)* and *YOUNG and ANDERSON (1986)* proved that, injection of PGF_{2α} during the postpartum period had exerted a great influence on the interval from calving to first postpartum estrus. *EL-SAID (1988)* found that the interval from calving to first service in cows was 69.2 ± 19.6 days and 57.8 ± 14.8 days in the control and PGF_{2α} treated groups respectively.

*EL-BAGHDADY *et al.* (1990)* concluded that, in Egyptian buffaloes PGF_{2α} significantly shortened the interval from calving to the first service.

The purpose of the present work is to study the effect of PGF_{2α} injected shortly after normal parturition in buffalo-cows on the time needed for placental drop and the interval from calving till the first postpartum estrus.

MATERIAL and METHODS

The animals used in the present study were 40 private buffalo-cows kept at Monofia province. Their age ranged from 7-12 years, gave from 4-7 breeding seasons and were apparently clinically healthy. The nutritional and managemental conditions were not similar. Their newborn calves were allowed to suckle freely their mothers for about 40-60 days postpartum, then were hand milked twice daily.

All the studied buffalo-cows calved normally (30 treated + 10 control). The treatment consisted of a single i.m. injection of 25.0 mg Lutalyse within 1/2-1 hour after calving. The control animals (calved normally) were injected with normal saline. The studied animals were injected to calculate the individual time needed for the placental drop. The reproductive

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tracts were rectally palpated daily allover 9 days postpartum, then once every two days till 21 days and then once every third days after that to asses the coincident ovarian activity. The scheme adopted for examination was the same described by EL-FADALY (1978). Vaginoscopy was also done to record the vaginal and cervieal findings. The time from birth till the onset of the first postpartum estrus was recorded for each animal. All the recorded data were statistically analysed using t-test to compare between the control and treated buffaloes according to SNEDECOR and COCHRAN (1967).

RESULTS

As shown in table (1), the mean duration from birth till the drop of the fetal membranes was 9.8 ± 1.84 and 4.8 ± 0.28 hours for the control and treated buffaloes respectively. It was evident that PGF_{2a} influenced favourably and significantly ($P < 0.05$) the time elapsed from calving till the spontaneous release of the fetal membranes. Inspite of injection of PGF_{2a} after normal parturition in the treated animals, two of them remained with retained fetal membranes and was treated by other preparations.

As shown in table (2), the average length of the interval between calving and the first postpartum estrus in buffalo-cows was 92.3 ± 4.52 and 43.0 ± 0.84 days for the control and PGF_{2a} treated buffaloes respectively. The results of statistical analysis revealed that, the interval from birth to the first postpartum estrus was significantly ($P < 0.01$) reduced by injection of PGF_{2a}.

DISCUSSION

TENNANT (1967) illustrated that in dairy cows the involution of the uterus to its non gravid size and function depended on the contraction of the uterine musculature, loss of placental tissue and fluids and regeneration of the uterine epithelium.

The obtained data (Table 1) showed that the mean time needed for placental drop among the control buffaloes was more prolonged (9.8 ± 1.84 hrs), than that needed for buffaloes injected with PGF_{2a} (4.8 ± 0.28 hrs), the difference was proved to be statistically significant ($P < 0.05$). These results were in agreement with those reported in buffaloes by FATTOUH *et al.* (1990) who found that injection of 25.0 mg PGF_{2a} i.m after normal parturition led to rapid expulsion of the fetal

membranes in the treated group (4.48 hr) than the control group (10.0 hr) BRANDER and BYWATER (1982), HERSCHLER and LAWRENCE (1984) and HORTA (1984) found that a rapid expulsion of fetal membranes occurred in cows treated with 1 or 2 mg fenoprostalene.

The obtained results (Table 2) showed that buffalo-cows treated with PGF $_{2\alpha}$ shortly after normal calving exhibited significant ($P < 0.01$) reduction in the interval between calving and first postpartum estrus in comparison with the untreated ones (92.3 ± 4.52 and 43.0 ± 0.84 days for the control and treated buffaloes respectively). These findings were in agreement with those of HAFS et al. (1975); ETHERINGTON (1984); YOUNG et al. (1984) and EI-EKNAWY (1989) who concluded that, the significant reduction in the interval from calving to the first postpartum estrus could be attributed to the influence of PGF $_{2\alpha}$ on the physiological mechanisms involved in quicker return of the ovaries from a relatively quiescent state to a cyclic endocrine activity which extend beyond luteolysis. In conclusion, injection of 25.0 mg Lutalyse as a single i.m dose shortly after normal parturition in buffaloes shortened significantly the time elapsed from calving till the spontaneous release of the fetal membranes. As well as it reduced significantly the interval from birth to the first postpartum estrus.

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Table (1): The postpartum period (hours) required for the drop of the placenta (Mean \pm S.E)

	Control buffaloes (n = 10)	Treated buffaloes (n = 28)
Mean	9.8	4.8*
S.E	± 1.84	± 0.28
Range	(5 - 24)	(3 - 9)

N.B : Two of the treated animals remained with retained fetal membranes.

* : Significant difference (P < 0.05).

Table (2): The period (days) from birth to the first postpartum estrus (Mean \pm S.E).

	Control buffaloes (n = 10)	Treated buffaloes (n = 30)
Mean	92.3	43.0**
S.E	± 4.52	± 0.84
Range	(70 - 120)	(40 - 50)

** : Highly significant difference (P < 0.01).