

EFFECT OF OXYTOCIN ON POSTPARTUM UTERINE INVOLUTION IN COWS

*S. Alagar, ¹M. Selvaraju, ²R. Ezakial Napoleon³ and K.A. Doraisamy⁴

Department of Veterinary Gynaecology and Obstetrics,
Veterinary College and Research Institute, Namakkal - 2
E-mail: dralagar5489@gmail.com (*Corresponding Author)

Abstract: Eighteen Postpartum Holstein Friesian (HF) crossbred cows aged between 2nd and 5th lactations were selected and randomly divided into 2 experimental groups viz., group I and II (control). On day 2 postpartum, cows of group I and II were treated with an intramuscular injection of 50 IU oxytocin and 5 ml normal saline, respectively. The cervical involution progressed rapidly and on day 30 postpartum, the cervix reached the pelvic cavity in group I. The cervical involution in control cows was slower than treatment group. In both the groups after day 20 postpartum, ridges on the uterus were not palpable, uterine contour was palpable and uterus was retractable rectally. Ultrasonography of cervix revealed that the cervical diameter was higher on day 30 postpartum in control group when compared to treatment group. On day 2 postpartum, the diameter of the uterine body measured by ultrasonography did not vary among treatment and control groups. In group I (Oxytocin), there was a rapid uterine involution from day 2 to 30 in postpartum cows compared with the control group.

Keywords: Involution, Oxytocin, Postpartum, Rectal palpation, Ultrasonography.

INTRODUCTION

Fertility after parturition of dairy cows is considered as the principal economic factor of milk producing farms. Alteration or extension of postpartum period with failure or delay in conception results in progressive economic loss to the poor farming community (Patel *et al.*, 2006). Puerperal uterine soundness is essential for the re-establishment of postpartum ovarian cyclicity and next pregnancy. Uterine muscular activity is important in the process of uterine involution. Speed of involution processes in the uterus is dependable of several factors like: parity, season, nursing and frequency of milking, climatic conditions where animals are held, quantity of produced milk, quality of nutrition, breed and health problems before and after parturition (Kawashima *et al.*, 2009).

Hence, an investigation was conducted to assess, the efficacy of oxytocin on uterine involution rate by rectal palpation and ultrasonographic observations.

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MATERIALS AND METHODS

The study was conducted at TVCC, VCRI, Namakkal in 18 Holstein Friesian cows aged between 2nd and 5th lactations. The selected cows were randomly and equally divided into 2 experimental groups viz., group I and II (control) consisting of 9 cows in each group. On day 2 postpartum, cows of group I were administered with an intramuscular injection of 50 IU oxytocin (10 ml, Syntophar[®], Interphar Healthcare Pvt. Ltd., Chandigarh, India) and group II were injected with 5ml normal saline (Parental drugs (India) limited, Indore, Madhya Pradesh, India). Gross and ultrasonographic evaluation of cervical and uterine involution in the experimental and control cows were carried out on day 2, 10, 20 and 30 postpartum. By rectal examination the involution of cervix and uterus (at the level of bifurcation; uterine body) was assessed with the help of palm and fingers. The approximate dimensions ascertained by palpation were expressed in millimeter. By ultrasonographic examination the changes in the diameter of the cervix and body of the uterus at the level of bifurcation and uterine body were measured and recorded in millimeter. The collected data were analysed strictly as per Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

The location of the cervix and uterus in cows after treatment with prostaglandin are presented in Table 1 (Ultrasonographic examination) and Table 2 (Rectal examination) respectively. In the current study, on day 10 postpartum, in 100 per cent of the cows, the cervix involuted from abdominal cavity to pelvic brim or pelvic cavity in the treatment group. The cervical involution in control cows was slower than treatment group. It indicated that Oxytocin was effective to promote cervical involution in cows with the maximum effect. In this experiment in all the groups after day 20 postpartum, ridges on the uterus were not palpable, uterine contour was palpable and uterus was retractable. These findings were in accordance with the reports of Lech *et al.* (1998) in cows. Between day 2 and 10 postpartum, the involution process of uterus was more rapid in treatment group than control group. It indicated that the uterotonic drugs played a role in reducing the size of the uterus. Ultrasonographic evaluation revealed the diameter of the cervix on day 2 postpartum ranged from 44.93 ± 0.32 to 45.73 ± 0.52 mm in treatment and control groups and it did not vary significantly among different groups. There was a significant reduction in diameter of cervix from day 2 to 10 postpartum in the treatment and control groups. Similar to this finding, Atanasov *et al.* (2012) found 45 per cent reduction in the diameter of the cervix between day 1 and 7 postpartum in cows. The mean diameter of the cervix on day 2, 10, 20 and 30 in the treatment and control

groups revealed that the cervical involution was more rapid in treatment group followed by the control group. It might be due to strong uterine contractibility on day 2 postpartum induced by oxytocin as suggested by Kundig *et al.* (1990). In this experiment, on day 2 postpartum the diameter of the uterine body measured by ultrasonography did not vary among treatment and control groups. Stimulation of endogenous PGF₂α secretion by oxytocin might contribute to the uterotonic effects of exogenous oxytocin in early postpartum cow when used for clinical purposes to enhance uterine involution (Bajcsy *et al.*, 2006). The results of the present study conclude that the administration of Oxytocin during postpartum period effectively hastened the uterine involution rate in Holstein Friesian (HF) crossbred cows.

TABLE -1 ASSESSMENT OF CERVICAL AND UTERINE INVOLUTION BY ULTRASONOGRAPHY IN COWS TREATED WITH OXYTOCIN

S.No.	Postpartum Days	Diameter of cervix (mm)	
		Group I	Group II
1.	2 nd	44.93 ^p ± 0.32	45.73 ^p ± 0.52
2.	10 th	38.88 ^{bq} ± 0.56	40.88 ^{dq} ± 0.54
3.	20 th	29.25 ^{br} ± 0.15	35.72 ^{cr} ± 0.23
4.	30 th	25.75 ^{bs} ± 0.18	30.38 ^{as} ± 0.67
Diameter of the uterine body (mm)			
1.	2 nd	47.25 ^p ± 0.36	47.63 ^p ± 0.91
2.	10 th	45.50 ^{bq} ± 0.09	46.01 ^{dp} ± 0.24
3.	20 th	31.75 ^{br} ± 0.15	32.50 ^{dq} ± 0.76
4.	30 th	25.13 ^{bs} ± 0.82	25.50 ^{cr} ± 0.05

Means bearing different superscript (p,q,r,s) between rows within a column in each group and between column (a,b,c,d) within each row differed significantly ($p < 0.05$).

TABLE – 2 ASSESSMENT OF CERVICAL AND UTERINE INVOLUTION BY RECTAL PALPATION IN COWS TREATED WITH OXYTOCIN

Cervical involution									
Parameters		Day 2		Day 10		Day 20		Day 30	
L.C (per cent)	A c	G I	G II	G I	G II	G I	G II	G I	G II
				44.44	55.56	-	22.22	-	-

	P b	44.44	44.44	55.56	44.44	33.33	77.78	11.11	77.78
	P c	11.11	-	44.44	33.33	66.67	22.22	88.89	22.22
Uterine involution									
L. Ut (per cent)	A C	100.00	88.89	66.67	66.67	-	33.33	-	-
	P b	-	11.11	33.33	33.33	88.89	44.44	77.78	77.78
	P C	-	-	-	-	11.11	22.22	22.22	22.22
Rid (per cent)	R-p	77.78	88.89	100.00	100.00	-	-	-	-
	R-NP	22.22	11.11	-	-	100.00	100	100.00	100.00
Ret (per cent)	Yes	-	-	55.56	77.78	100.00	100.00	100.00	100.00
	No	100.00	100.00	44.44	22.22	-	-	-	-
Contour (per cent)	P	-	-	66.67	77.78	100.00	88.89	100.00	100.00
	NP	100.00	100.00	33.33	22.22	-	-	-	-

L.c. – Location of cervix; Ac- Abdominal cavity;Pb – Pelvic brim, Pc- Pelvic cavity, L.Ut – Location of uterus, Rid - Ridges, R-p – Ridges palpable, R-NP- Ridges not palpable, Ret-retractable, P - contour palpable , NP - contour not palpable.

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