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Effect of Oxytocin Administration or Natural Early Uterine Involution on Reproductive Traits, Progesterone Profile, and Milk Production of Friesian Cows

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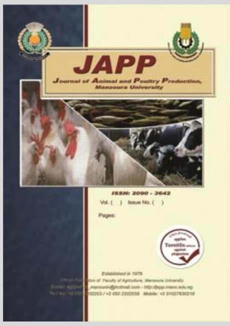

ABSTRACT

The present study aimed to compare reproductive performance, milk yield, and progesterone profile of Friesian cows diagnosed with late uterine involution (UI), natural early-UI, and those induced to early-UI by oxytocin (OXY). At calving, total of 30 normal multiparous lactating Friesian cows the experimental animals (n=30) were divided into two groups, one group (control, n=20) which were left normally without treatment up to complete UI, and another group (n=10) were i.m injected with 50 IU of OXY within 6-12 hours after parturition. Results showed that mean duration of UI was earlier ($P<0.05$) in early UI and OXY groups by 22.2 and 18.8% as compared to late UI. Estrus/service rate (ER) increased ($P<0.05$) in OXY as compared to late-UI, but did not differ significantly in early-UI. Postpartum 1st estrus PPFEI and service (PPFSI) intervals were shorter ($P<0.05$) in early-UI than in late-UI and OXY groups. Service period was lower ($P\geq0.05$) in early-UI and OXY than in late-UI groups. Days open was lower ($P<0.05$) in early-UI than in late-UI. Pregnancy rate (PR) was higher ($P<0.05$) in early-UI and OXY than in late-UI. Reproductive index was higher in OXY than in late-UI (63.39 vs. 42.33%, $P<0.05$), and in early-UI than in late-UI (46.99 vs. 42.33%, $P\geq0.05$). Milk production (weekly, daily, and total) was not affected. Early uterine involution naturally in lactating cows or inducing early uterine involution by oxytocin within 24 h of calving have a beneficial effect on the reproductive performance of lactating cows without adverse effect on milk production.

Keywords: Cows, uterine involution, oxytocin, reproductive performance, milk production.

INTRODUCTION

In dairy cows, reproductive efficiency is economically important due to lactation. Reproductive disturbances in lactating cows can decrease calf and milk yields. To realize the maximum economic value, calf/cow/year is the target of breeders. This is achieved if each cow was conceived within 2-3 months after calving. Postpartum period starts immediately after calving until the complete uterine involution (UI), and restoration of estrus and ovulatory activity. Uterine involution (UI) is defined as complete when the uterus returned to its normal non-pregnant position and when the two horns were similar in diameter and showed normal consistency and tonus (Abdel-Khalek *et al.*, 2012, 2013, 2015). In normal postpartum phase, the interval required for decreasing the size of uterus, necrosis, caruncles shrinkage, and the endometrial degeneration (uterine involution) ranges between 25 and 50 days (Sheldon *et al.* 2008).

For increasing uterine contractility of dairy cows, various uterotonic drugs were used during the puerperal phase to accelerate the process of uterine involution, such as natural prostaglandin F2α or its synthetic analogues, Ca borogluconate, carazolol, and oxytocin preprations (Sobiraj *et al.*, 1998). Oxytocin (OXY) is one of the ecbolic drugs, most frequently used to stimulate uterine contractility in early postpartum cows. Intramuscular injection with OXY between 14 and 16 h postcalving temporarily stimulated contractions myometrium (Bajcsy *et al.*, 2005) and leads to the uterine evacuation via improvement of contractions, and acceleration of UI (Bajcsy *et al.* 2006). However, low intravascularly doses of OXY (0.8, 1.6 or 3.2 IU) were found not to result in an increased PGF2α release in uterine venous blood in late pregnant cows (Taverne *et al.*, 2001).

Several reports indicated that UI negatively affect fertility of cows, OXY administration is used for enhancing cow performance (Abdel-Khalek *et al.*, 2013, 2015) and buffalo performance (Abdel-Khalek *et al.*, 2012) cows in order to raise their productiveness. However, the results regarding the effect of OXY on UI and milk production in dairy cows are conflicted (Stephen *et al.*, 2019). There was a high variability among individual animals in activity of the uterine muscle to process postpartum uterine involution which is responsible for removing the excessive uterine fluid and debris early post-partum (Bajcsy *et al.*, 2005). This finding may result in confliction, which may be related to the physiological status of cows regarding the ability of the uterus in control or treated animals to show early or low involution after calving. We assumed that if the uterus of the majority or all animals treated with OXY might be have the ability to naturally involute without treatment, so OXY treatment may have conflicted effect. Schirar and Martinet (1982) recorded that re-initiation of normal cyclic activity postpartum depends on the return of the uterus to non-gravid size and function during the postpartum period.

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Therefore, the present study aimed to compare reproductive performance, milk yield, and progesterone profile of Friesian cows diagnosed with late UI (negative control), natural early UI (positive control), and those induced to early UI by oxytocin treatment.

MATERIALS AND METHODS

This study was carried out at Sakha Experimental Station, belonging to Animal Production Research Institute, Agricultural Research Center, Ministry of Agriculture, Egypt.

Animals:

At calving, 30 multiparous lactating Friesian cows having body weight of 515.3±25.50 kg, within 3-4 parities, and normally calved with placental drop duration (6 to 9 h) and without any reproductive disorders after calving were chosen to use in this study. All animals were similar in milk production during the previous season.

Within the day of calving, the experimental animals (n=30) were divided into two groups, a group of animals (control, n=20) were left normally without treatment up to complete uterine involution (UI), and another group (n=10) were intramuscularly (i.m) injected with 50 IU oxytocin (OXY, ADWIA Co. S.A.E. 10^{th} of Ramadan City, Egypt) within 6-12 hours after parturition.

During the experimental period, all animals were housed under semi-open sheds. They were received a ration according to requirements of maintenance and milk yield. The offered ration was consisted of concentrate feed mixture, fresh clover (*Trifolium alixandrinum,* 2^{nd}-4^{th} cut), and rice straw by-product.

Routine examination of the genitalia was conducted by ultrasonography examination at three-day interval after calving to judge the uterine involution. In this study, animals were examined by real time ultrasonography equipment (Aquila, pie medical company, 8.0 MHz) with linear rectal transducer. The transducer was placed in a transversal position in relation to the horns at its middle section; distance between the outer surfaces was obtained.

Diameter of uterine horns (gravid and non-gravid) was determined and uterine involution was considered to be complete when both gravid and non-gravid horns were nearly in symmetrical measure and no further change took place between two consecutive examinations in diameter of horns (Abdel-Khalek *et al*., 2015).

After complete uterine involution, the control animals (n=20) were divided according to UI duration to early (≤30 days, n=12) and late (>30 days, n=8). Therefore, this study included three groups, G1: control late UI, G2: control early UI, and G3: induced early UI by OXY.

Milking and suckling system:

During the 1^{st} week post-partum, calves in all groups were left with their dams for 3-4 days to receive the colostrums, and then it was artificial suckled until weaning. Milking machine was used for milking all cows (6 a.m. and 4 p.m.). Concentrate mixture was offered just before milking and milk yield of the morning and evening milking was recorded as weekly milk yield for 15 weeks lactation period..

Reproductive traits:

Estrus signs were detected for each cow starting from 15 days postpartum until 105 days after calving. Post-partum 1^{st} estrus interval (PPFEI) was determined as from calving to exhibiting the post-partum 1^{st} estrus signs. At least 45-50-day post-partum, artificial insemination was used as a method of breeding in the farm under the current study for all cows in heat, then estrus/service rate (number of animals in heat/total number of animals x100) and post-partum 1^{st} service interval (PPFSI, from calving to 1^{st} service) were calculated.

On day 45-50 post-insemination pregnancy was diagnosed by rectal palpation and indicated by blood plasma P4 concentration 4 wk post-insemination, then service period (interval from 1^{st} service to conception), number of services per conception (BSC), days open (DO, days from calving to conception), and pregnancy rate (PR, number of conceived animals/number of inseminated animals x100) were determined. Also, reproductive index (RI)= [(1/NSC) x (DO/60) x PR%].

Progesterone profile:

Blood samples were collected at parturition, 4, 6, and 8 wk post-calving, on day of AI, and 4 wk post-AI. Blood samples were collected from all animals in each group from the jugular vein into clean test tubes containing heparin as an anticoagulant, then blood plasma were collected by centrifugation at 4000 rpm for 15 min and stored at −20ºC until analysis for P4 assay. Radioimmunoassay (RIA) was used for plasma P4 determination (Coat-A-Count® Siemens Medical Solutions Diagnostics, Los Angeles, CA, USA). The intra and inter-coefficient of variation were 3.54 and 9.21%, respectively.

Statistical analysis:

The obtained data were statistically analyzed by general linear model procedures using computer programme of SAS (2004). One-way ANOVA was used to test the differences between groups. The statistical model was: $Y_{ij} = \mu + A_i + e_{ij}$. Where: Y_{ij} = observed values, μ = Mean, A_i = group and e_{ij} = random error. The significant differences among groups (Late, early and OXY) were separted by Duncan (1955). The comparison between pregnant and non-pregnant animals were set by T-test.

RESULTS AND DISCUSSION

Duration of uterine involution:

The present results in Table 1. showed that incidence of UI was 40% (8/20). The pattern of uterine involution (UI) in the experimental groups appeared to have different extent of UI in each experimental group. According to the experimental design, mean duration of UI was earlier ($P<0.05$) in G2 and G3 than in G1 by 22.2 and 18.8%. The process of UI was clearly evident and was completed almost within 28-45 d postpartum in all groups, 32-42 in G1, 28-30 d in G2, and 28-35 d in G3. As very few cows (20%) completed UI above 30 d postpartum in G3 as compared to 50%, and also further 50% of animals completed UI at more than 37 d in G1. Such results indicated positive effect of OXY treatment on reducing UI duration in cows, similar to G2 with early UI.

In accordance with the present results, OXY or its preparations can be used at parturition to increase uterotonic activity of cows (Sobiraj *et al*., 1998; Starke *et al*., 1998). Many studies have indicated that OXY has positive effects on early UI by its administration within 12 h of parturition in cows (Burton *et al*., 1990; Abdel-Khalek *et al*., 2013, 2015).

In early reports, UI was defined as the process associated with the return of the postpartum uterus to the state of initiating and supporting another pregnancy (Zemjanis, 1970). Diameter of the uterine horns can be monitored directly using transrectal ultrasonography (Sheldon *et al*., 2003), rectal palpation (Kindahl *et al*., 1999), or indirectly by determining PGF2α metabolite concentration in blood serum (Sheldon *et al*., 2001). The present study aimed to compare reproductive performance, milk yield, and progesterone profile of Friesian cows diagnosed with late UI (negative control), natural early UI (positive control), and those induced to early UI by OXY treatment. In this study, the obtained results of the uterine horn symmetry of the gravid and non-gravid horns, indicated early UI (≤30 day) in 80% of postpartum cows. Based on ultrasonography examination used in our study, the complete uterine involution achieved after a duration of 30.7±0.69 day in OXY group, being earlier (P<0.05) than that in late UI group (37.8±0.94 day), but did not differ significantly than that in early UI group (29.4±0.25 day). An acceleration of UI by OXY treatment immediately after calving was reported (Khatri *et al*., 2013). Similarly, period elapsed from calving to detectable symmetrical uterine horns was reported to decrease to 29.9 in multiparous cows treated with 50 IU of OXY as compared to 33.7 d in controls (Abdel-Khalek *et al*., 2013). In another study on primiparous cows, postpartum duration required for symmetry in gravid and non-gravid horns was shorter in animals treated with OXY (20.9 d) than 28.7 d in controls (Abdel-Khalek *et al*., 2015). In buffaloes, also OXY treatment showed positive impact on improving UI (Abdel-Khalek *et al*., 2012). Normal myoelectrical activity of the uterus is greater at calving and decreases drastically around 7 to 9 d postpartum (Gajewski *et al*., 1999). However, when exogenous OXY was administered, the myometrium responded with strong contractions (Gajewski *et al*., 1999).

In dairy cows, the complete UI occurred at an interval averaging 33.7 day (Abdel-Khalek *et al*., 2013). The combined data of Perkins and Kidder (1963) showed that UI occurred on the average of 37.7 days postpartum (±14.5-day standard deviation). However, 29.4, and 47 days were reported for UI duration in lactating cows by Casida and Wisnicky (1950), and Buch *et al*. (1955), respectively. The wide variation in UI duration among reports may be attributed to the examination method, season of calving, cow breed or managerial factors. Also, criteria of determination of the end point of UI, tool of measuring the uterine size, and sequence of examinations may be contributed in this concern (Harbac, 2006).

The normal effect of OXY on UI of cows in this study may be attributed to that the biological effect of OXY depends on two factors: on how quickly it is removed from the circulation by excretion and through metabolism, and on whether there are enough specific receptors available, which are capable of binding the drug. It can therefore be anticipated that this effect would be short lasting, as the half-life of oxytocin has been reported to be short in cows (Wachs *et al*., 1984).

Table 1. Duration (day) and frequency distribution (%) of post-partum uterine involution (UI) of lactating cows in experimental groups.

Experimental Group	N	Uterine involution (day)		Post-partum day		
		Mean	Range	25-30	>30-37	>37-42
G1 (Control, late UI)	8	37.8±0.94[a]	32-42	-	4/8 (50)	4/8 (50)
G2 (Control, early UI)	12	29.4±0.25[b]	28-30	12/12 (100)	-	-
G3 (Treated, OXY)	10	30.7±0.69[b]	28-35	8/10 (80)	2/10 (20)	-

a and b: Means with different superscripts within the same column are significantly different at P<0.05.

Reproductive performance:

Estrus/service activity:

Results in Table 2. revealed that estrus/service rate (ER) was higher (P<0.05) in G3 than in G1. The differences in ER between G2 and G1 and G3 were not significant. Postpartum 1st estrus (PPFEI) interval was decreased (P<0.05) in G2 as compared to G1 and G3. However, postpartum 1st service (PPFSI) interval was also the shortest (P<0.05) in G2, but did not differ from that in G1 and G3. Service period showed insignificant differences among groups. These results indicated positive of OXY treatment on improving estrous activity and early UI on shortening PPFEI and PPFSE of cows.

Table 2. Estrous activity of lactating cows in experimental groups.

Experimental Group	Estrus/service Rate	PP 1st-estrus interval (d)*	PP 1st-service interval (d)*	Service period (day)
G1 (Control, late UI)	6/8 (75.0)[b]	62.5±3.46[a]	70.9±6.40[a]	29.2±10.83
G2 (Control, early UI)	10/12 (83.3)[ab]	44.7±4.08[b]	51.3±7.86[b]	15.2±6.881
G3 (Treated, OXY)	9/10 (90.0)[a]	57.1±3.12[a]	61.3±6.19[ab]	20.2±10.79

a and b: Significant group differences at P<0.05.

Number of services per conception:

Number of services per conception (Table 3) decreased in G2 and G3 in comparing with G1, showing the lowest non-significant values in G2. These results came in parallel with the highest frequency distribution of animals required one service to conceive in G2, followed by G3, while the lowest in G1 (P<005). The distribution of two services was nearly similar in all groups, while cows required three services showed an opposite trend to those required one service (P<0.05).

Table 3. Number of services per conception of lactating cows in experimental groups.

Experimental Group	Number of services per conception	Frequency distribution of NSC (%)		
		1 service	2 services	3 services
G1 (Control, late UI)	1.75±0.479	2/4 (50.00)[b]	1/4 (25.00)	1/4 (25.00)[a]
G2 (Control, early UI)	1.50±0.252	5/8 (62.50)[a]	2/8 (25.00)	1/8 (12.50)[b]
G3 (Treated, OXY)	1.57±0.291	4/7 (57.14)[ab]	2/7 (28.57)	1/7 (14.29) [b]

a and b: Significant group differences at P<0.05.

Days open and pregnancy rate:

Duration of days open reduced significantly in G2 and non-significantly in G3 as compared to G1. Pregnancy rate (PR) based on total animals or served cows was lower (P<0.05) in G1 than in G2 and G3 (Table 4). The obtained results revealed a positive impact of natural early UI or OXY treatment on improving PR of lactating cows.

Table 4. Days open and pregnancy rate of lactating cows in experimental groups.

Experimental Group	Days open	Pregnancy rate	
		Total animals	Inseminated animals
G1 (Control, late UI)	88.9±7.61[a]	4/8 (50.00)[b]	4/6 (66.67)[b]
G2 (Control, early UI)	63.4±8.33[b]	8/12 (66.67)[a]	8/10 (80.00)[a]
G3 (Treated, OXY)	82.3±7.39[ab]	7/10 (70.00)[a]	7/9 (77.87)[a]

[a and b]**: Significant group differences at P<0.05.**

Reproductive index:

Reproductive index of cows in experimental groups was higher in G3 than in G1(63.39 vs. 42.33%, P<0.05), and in G2 than in G1 (46.99 vs. 42.33%, P≥0.05). These results revealed the positive impact of OXY treatment on reproductive performance in term of improving pregnancy rate (Fig. 1).

To reduce the anestral interval and improve the reproductive performance, the early UI and ovarian activity resumption are required (Hussein *et al.*, 2013). In dairy cows, complete UI is the main factor limiting resumption of ovarian activity after parturition (Van De Plassch, 1981) and UI has an important role in the next pregnancy after calving (Chauhan *et al*., 1977). The UI has an important role in the resumption of ovarian post-partum activity and re-initiation of normal cyclic activity post-partum depends on the return of the uterus to non-gravid size and function (Schirar and Martinet, 1982).

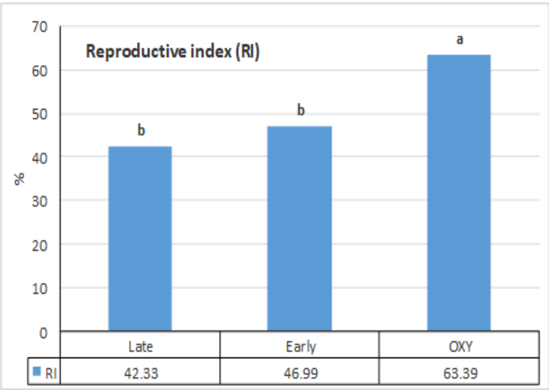

Fig. 1. Reproductive index of cows in the experimental groups.

In our study, OXY treatment increased ER and had insignificant effect on PPFEI, PPFSI, and service period as compared to late UI group. Similarly, Abdel-Khalek *et al.* (2015) reported that ER increased in primiparous Friesian cows treated with OXY, but PPFEI, PPFSI, and service period were not affected by OXY treatment. Also, postpartum 1st ovulation interval of cows was shorter in cows treated with OXY than in controls (Blanchard *et al*., 1991).

The postpartum anoestrus duration has a close relationship with days open (Perera, 2011). Paisley *et al.* (1986) concluded that the duration of days open is often longer due to delaying the UI and restoration of estrous cycles. The obtained results indicated shorter days open significantly in early UI group, and non-significantly in OXY group as compared to late UI group. However, number of services/conception insignificantly improved in early UI and OXY groups as compared to late UI. These results are in agreement with (Abdel-Khalek *et al*., 2013, 215) on Friesian cows treated with OXY. On comparable with our results, Abdel-Khalek *et al*. (2015)

In accordance with increasing pregnancy rate in early UI and OXY groups, Abdel-Khalek *et al.* (2013) found that the pregnancy rate increased to 66.7% in multiparous cows treated with OXY as compared to 40% in control one. In primiparous cows, Abdel-Khalek *et al.* (2015) found that pregnancy rate was higher in OXY than in control group (80 vs. 60%)

The improvement notice in reproductive index of cows in OXY group has suggested a relationship between the release of OXY and gonadotrophins secretion (Hays and VanDemark, 1953). Administration of OXY was effective in reducing diestrus in dairy heifers (Hansel *et al*., 1961) treated with 200 IU OXY. On the same line, early UI was important factor for limiting resumption of postpartum ovarian activity (Van De Plassch, 1981). Thus, the natural or induced early UI has an important role in a cow to becoming pregnant again (Chauhan *et al*., 1977).

Progesterone profile:

In experimental groups:

At calving, the plasma P4 levels were <1.0 ng/ml in all groups, slightly increased at 4 wk post-partum, but values of P4 still <1.0 ng/ml, then showed a similar trend of increase at 6 wk post-partum, being ≥1 ng/ml in all groups. At all previous times, the differences in P4 concentration among groups were not significant. At 8 wk post-partum, P4 concentration was significantly (P<0.05) higher in late UI than in early UI and OXY groups, showing marked decrease to be <1.0 ng/ml at on day of AI in all groups. At 4 wk post-AI, P4 concentration showed the maximal values (P<0.05) in early-UI, ranking the second in OXY, and the latest in late-UI group (Fig. 2).

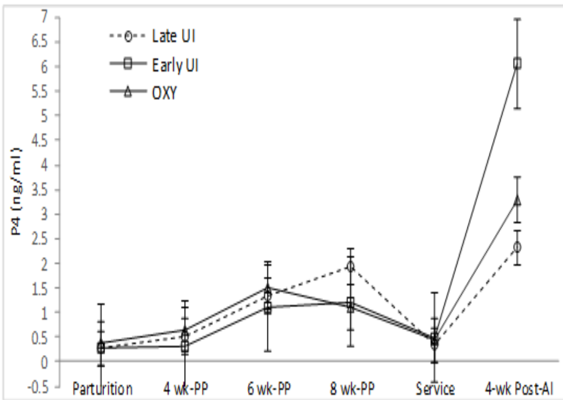

Fig. 2. Change in plasma P4 level of cows at parturition, different post-partum weeks, and post-AI.

In pregnant and non-pregnant cows:

At parturition, P4 level increased (P<0.05) in pregnant as compared to non-pregnant cows in late and early UI groups, but the difference was not significant in OXY group. At 4 wk post-partum, there are no significant differences in P4 concentration among groups. However, at 6 wk post-partum, P4 concentration was significantly (P<0.05) higher pregnant than n non-pregnant animals of early UI and OXY groups, but animals in late UI group showed an opposite trend of differences. At 8 wk post-partum, P4 level showed inconsistent trend of differences in pregnant and non-pregnant animals in each group. At service (AI), the differences in P4 level between pregnant and non-pregnant animals were not significant in all groups. The more obvious increase in P4 level in pregnant than non-pregnant animals was observed at 4 wk post-AI in all groups (Fig, 3).

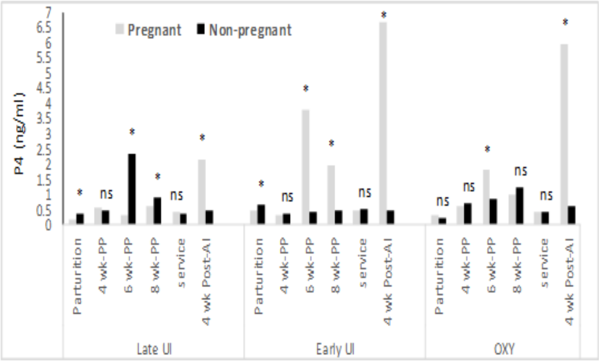

Fig. 3. Concentration of plasma progesterone in pregnant and non-pregnant animals in all experimental groups at post-partum weeks.

There is no information about the effects of endogenous OXY during the early postpartum period, when P4 concentration is very low (Stephen *et al.*, 2019). In comparing with late UI group, P4 concentration tended to be higher at 4 and 6 wk, and 4=wk post-AI only in OXY group. Significant higher P4 level in OXY group could be due to greater CL number/or increased luteal activity, while low P4 level in late UI group was functional insufficient of the CL in short luteal phase (Campanile *et al.*, 2010; Yotov *et al.*, 2012). The rise in P4 level in early UI than in late UI groups was observed at 4-wk postpartum. The increase observed in P4 concentration of cows in late UI group as compared to OXY and early UI groups at 8-wk may be due to that 50% of cows were in luteal phase, while most cows in OXY and early UI were near estrus. This results indicated the modulatory or supporting roles of OXY in luteal development and regression (Kotwica *et al.*, 1998), but in our study, OXY administration had no effect on the development of CLs, which continued to increase in normal size. Additionally, OXY directly stimulates P4 secretion in luteal cells (Miyamoto *et al.*, 1991).

Milk yield:

Results of milk production illustrated in Fig. 4 and Table 5 revealed insignificant differences in weekly, daily, and total mil yield of cows in all groups. In Friesian cows, several authors reported insignificant effect of OXY treatment on milk production in multiparous (Abdel-Khalek *et al*., 2013) and primiparous (Abdel-Khalek *et al.*, 2013). Similar results were reported by Abdel-Khalek *et al.* (2012) in Egyptian buffaloes.

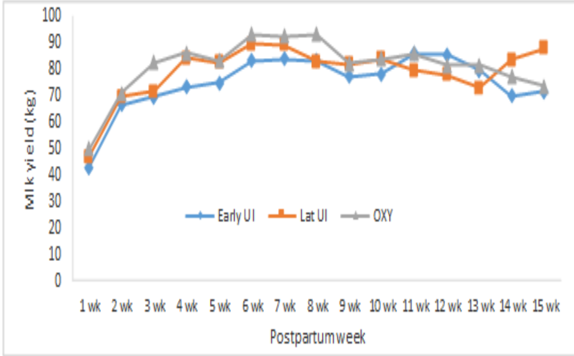

Fig. 4. Weekly milk yield of cows in different experimental groups for a lactation period of 15 weeks.

Table 5. Total and daily milk yield of cows in different experimental groups for a lactation period of 15 weeks.

Experimental group	Total milk yield (kg)	Daily milk yield (kg)
G1 (Control, late UI)	1122.4±83.57	10.6±0.78
G2 (Control, early UI)	1180.8±95.78	11.2±1.40
G3 (Treated, OXY)	1215.8±104.9	11.6±0.85

CONCLUSION

Early uterine involution naturally in lactating cows or inducing early uterine involution by oxytocin within 24 h of calving have a beneficial effect on the reproductive performance of lactating cows without adverse effect on milk production.

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تأثير المعامله بالأوكسيتوسين أو عودة الرحم لوضعه الطبيعى مبكرا على الخصائص التناسليه، صورة البروجيستيرون وأنتاج اللبن في أبقار الفريزيان

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كان الهدف من هذه الدراسة هو مقارنة الاداء التناسلي وانتاج اللبن وصورة البروجيستيرون في الابقار الفريزيان لتشخيص عودة الرحم طبيعيا لوضعة الطبيعي متأخرا و مبكرا وتلك المستحدثة لعودة الرحم مبكرا باستخدام المعاملة بالاكسيتوسين .اجريت هذه الدراسة عند الولادة على عدد 30 من ابقار الفريزيان الحلابة متعددة المواليد الطبيعية وكانت مقسمة الى مجموعتين المجموعه الاولى (كنترول) عدد20حيوان وكانت متروكة طبيعيا بدون أي معاملات حتى عودة الرحم لوضعة الطبيعي والمجموعة الاخرى عدد 10حيوانات تم حقنها في العضل ب 50 وحدة دولية من الاكسيتوسين خلال من 6 الى 12 ساعة بعد الولادة. وكان اهم النتائج المتحصل عليها هي:- لوحظ بان متوسط فترة رجوع الرحم لوضعة الطبيعي متأخرا معنويا ($P<0.05$) في مجموعة الكنترول المبكرة لعودة الرحم لوضعة الطبيعي عن مجموعة المعاملة بالاكسيتوسين ب 22.2 و 118.8% مقارنة بمجموعة الكنترول المتأخرة في عودة الرحم لوضعة الطبيعي. - زاد معدل التناسل (الشياع/تلقيح) معنويا ($P<0.05$) فى مجموعة المعاملة بالاكسيتوسين مقارنتا بمجموعة الكنترول المتأخرة عودة الرحم لوضعة الطبيعي ، ولكن كانت لا توجد فروق معنوية بمجموعة الكنترول المبكرة في عودة الرحم لوعة الطبيعي. - كانت فترة اول شياع واول تلقيح بعد الولادة اقصر معنويا ($P<0.05$) في مجموعة الكنترول المبكرة في عودة الرحم لوضعة الطبيعي عن مجموعة الكنترول المتأخرة في عودة الرحم لوضعة الطبيعي ومجموعة المعاملة بالاكسيتوسين.- كانت فترة التلقيح كانت اقل معنويا ($P\geq0.05$) في مجموعة الكنترول المبكرة في عودة الرحم لوضعة الطبيعي ومجموعة المعاملة بالاكسيتوسين عن مجموعة الكنترول المتأخرة في عودة الرحم لوضعة الطبيعي. - كانت فترة اليوم المفتوح (الفترة من الولادة حتى التلقيح المخصب) اقل معنويا ($P<0.05$) في مجموعة الكنترول المبكرة في عودة الرحم لوضعة الطبيعي عن المتأخرة في عودة الرحم لوضعة الطبيعي. - كان معدل الحمل اعلى معنويا ($P<0.05$) في مجموعة الكنترول المبكرة في عودة الرحم لوضعة الطبيعي ومجموعة المعاملة بالاكسيتوسين عن مجموعة الكنترول المتأخرة فى عودة الرحم لوضعة الطبيعي. - كان دليل التناسل اعلى معنويا في مجموعة المعاملة بالاكسيتوسين عن مجموعة الكنترول المتأخرة في عودة الرحم لوضعة الطبيعي (63.39 مقابل 42.33% ، $P<0.05$) وفى مجموعة الكنترول المبكرة في عودة الرحم لوضعة الطبيعي عن المتأخرة فى عودة الرحم لوضعة الطبيعي 46.99 مقابل 42.33% ، $P\geq0.05$)- لا يوجد تأثير لإجمالي انتاج اللبن وانتاجه يوميا واسبوعيا بالمعاملة. نستنتج من هذه الدراسة:أن عودة الرحم لوضعة الطبيعي سواء كان مبكرا طبيعيا او مبكرا بالمعاملة بالاكسيتوسين خلال ال 24 ساعة من الولادة له تأثير نافع على الاداء التناسلي في الابقار الفريزيان الحلابة بدون أي تأثير على انتاج اللبن.