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EFFECT OF POSTPARTUM REPRODUCTIVE DISTURBANCE ON SUBSEQUENT FERTILITY IN A FRIESIAN DAIRY COWS

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ABSTRACT

The effect of pathological condition (Endometritis, pyometra and retained placenta) of uterus during the postpartum period on subsequence fertility was investigated in 90 parturient cows. Animal with normal puerperium showed complete uterine involution in 28.94 day, service per conception was 2.11,days open were 131.9, pregnancy rate was 66.67%, while in endometritic cows showed complete uterine involution in 33.80 days, service per conception was 3.2, days open177.6, pregnancy rate was 40%.Moreover in cows suffered from pyometra showed complete uterine involution in 45 day, service per conception was 4.13days open 209, pregnancy rate 33.33%.In case of retained placenta uterine involution was completed in 46.50 day, Service per conception were 4, days open 184.7, pregnancy rate was 40%. While in case of cows having uterine affections and treated with oxy-ject 5% uterine involution was 37.81, service per conception 2.94, days open 180.50, pregnancy rate 50%.Moreover in cows having uterine affection and treated with $PGF_2\alpha$ uterine involution was 29.13, service per conception 2.25, days open 123.1, pregnancy rate was 62.50%. We can concluded that pathological puerperium including endometritis, retained placenta and pyometra affect negatively on subsequante reproductive performance comparing to normal puerperial cows. Furthermore $PGF_2\alpha$ give good result in treatment of uterine affection more than oxy-ject 5% treatment.

INTRODUCTION

Post parturient period, termed also puerperium was characterized by normal postpartum events such as expulsion of placenta and vaginal discharge, uterine involution and return of ovarian cyclic activity **(Sheldon, 2004).**

Postpartum genital infections result from uterine contamination with bacteria during parturition. Moreover, uterine infection implies adherence of pathogenic organisms to mucosa, colonization or penetration of the epithelium and or release of toxins that leading to uterine disease **(Azawi et al., 2008).**

Furthermore, the uterus is protected normally by mechanical barriers as vulva, vestibule and cervix but around parturition these barriers open and this enhance the incidence of uterine infections **(Sheldon 2004).**

Postpartum endometritis is one of most important disorders in bovine causing high economic loses due to prolonged days open and prolonged calving interval **(Azawi et al., 2008).**

During postpartum period about 50% of dairy cows have irregular ovarian cycles and animals with uterine affections are more likely than normal animals to have prolonged postpartum luteal phases and delayed resumption of ovarian cycles after calving

(Opsomer et al., 2000).

The current study aimed to gain more information under field condition about problems of puerperium with special reference to subsequence reproductive fertility.

MATERIAL AND METHODS

Animals and management:

This study was carried out from September 2015 to March 2017. A total of 90 parturient Friesian Cows aged 3-7 years old with 1-3 lactation season belonging to a private farm at Damietta governorate, Egypt, were used in this study. These animals were kept in an open hygienic yards provided with holding pens for examination, ground yellow corn, soybean meal, linseed meal, barseem or hay and minerals-vitamins supplement (Total mixed ration).This study passed in two ways as follow:

Experiment (1): Included the study of effect of some reproductive disorders on postpartum reproductive performance. In this experiment 58 cows was included to study the effect of retained placenta (10), endometritis (15) and pyometra (15) on postpartum reproductive performance compared with normal parturient cows (18).

Experiment (2): Include the study of effect of some treatment trials on postpartum reproductive performance in infected cows. In this experiment the cows (50) under investigation were divided into 3 groups according to the degree of uterine affection:

Group 1: (control group) Included 18 normal parturient cows without clinical uterine affection and all cows received no treatment.

Group 2: Included 16 cows which have clinical uterine infection after Parturition and all cows treated with intrauterine infusion of antibiotic oxy-ject 5% (oxytetracycline, Adwia company) two doses the first one at 15 day postpartum and the second one after 10 days from the first treatment.

Group 3: Included 16 cows which have clinical uterine infection after parturition and all cows treated with $PGF_2\alpha$ (Synchromate, Bremer Pharm Company, Germany) by I/M injection two doses the first one at 15 day postpartum and the second one after 10 days from the first treatment.

Diagnosis of endometritis and pyometra conducting through vaginal examination **(Hiroaki, 2017)**, transrectal palpation **(Sheldon, et al. 2002)** and ultrasound **(V. Kumar and Purohit, 2009).**

Reproductive assessments: All cows were observed for dropping of placenta and regularly examined weekly after parturition for assessment of uterine involution through rectal palpation **(Miettinin, 1990)** and ultrasonograghic examination **(Pierson and Ginther 1984)**.

Finding from rectal palpation, presence or absence of retained placenta and VDS were recorded for each cow.

Evaluation of postpartum reproductive fertility: Based on the clinical examination, the reproduction performance of cows was evaluated by the following reproductive

parameters: time elapsed from calving to complete uterine involution, days open, number of services per conception and Pregnancy diagnoses after two months apart from the last service was checked to determine conception rate.

Statistical analysis:

Graphpad Prism Program, Version 5.00, Variant were compared using student T test. Variant were considered significant when $p < 0.05$ (SPSS. Inc., Chicago,IL, USA).

RESULT

The results of experiment (1) are shown in table (1), The time required for complete uterine involution was 28.94 days in control group. It was 33.80 days in cows suffering from postpartum endometritis where it was 45.0 days in cows suffered from pyometra and 46.50 in cows suffered from retained placenta. Service per conception in control group was 2.11 compared to retained placenta group was 4.0 while it was 4.13 in pyometra group and 3.2 in endomeritis group. Days open in control group was 131.9 compared to retained placenta group was 184.7 while it was 209 in pyometra group and 177.6 in endomeritis group. Pregnancy rate was 66.67% in control group, it was 40% in cows suffering from postpartum endometritis where it was 33.33% in cows suffered from pyometra and 40% in cows suffered from retained placenta. Analysis of variance revealed a significant variation in the uterine involution, service per conception, days open and pregnancy rate in control group compared to the other 3 groups.

Table (1): Reproductive parameters of all groups of experiment (1).

Parameters \ Groups	Control	Retained placenta	Pyometra	Endometritis
Uterine Involution	28.94 ± 1.56	46.50 ± 2.36***	45.0 ± 1.54***	33.80 ± 1.79*
Service per conception	2.11 ± 0.22	4.0 ± 0.26***	4.13 ± 0.27***	3.2 ± 0.30**
Days Open	131.9 ± 17.32	184.7 ± 16.83	209.0 ± 1.27***	177.6 ± 19.83
Pregnancy rate	66.67 ± 11.43	40.0 ± 16.33	33.33 ± 12.60	40.0 ± 13.09

- *P<0.05
- **P<0.01
- ***P<0.001
- † (dagger symbol) 0.05 <P<0.1 (trend)

The result of experiment (2) are shown in table (2) as follow: The present study showed a significantly improvement in uterine involution in cows treated with $PGF_2\alpha$ (29.13 days) while in cows treated with oxy-ject 5% intrauterine there is no improvement (37.81) in uterine involution. Treatment with $PGF_2\alpha$ showed significant (2.25 ± 0.32) improvement in service per conception than treatment with oxy-ject 5% (2.94 ± 0.30). Furthermore cows treated with $PGF_2\alpha$ showed significant decrease in days open (123.1 ± 19.28) than cows treated with oxy-ject 5% (180.5 ± 17.70). In the present study cows treated with $PGF_2\alpha$ showed significant improvement in pregnancy rate (62.50 ± 12.50) when compared with cows treated with oxy-ject 5% (50.0 ± 12.91).

Table (2) Reproductive parameters of all groups in experiment (2):

Groups / Parameters	Control	Oxy-ject 5%	$PGF_2\alpha$
Uterine Involution	29.22 ± 1.64	37.81 ± 1.58**	29.13 ± 1.96
Service per conception	2.17 ± 0.21	2.94 ± 0.30	2.25 ± 0.32
Days Open	131.9 ± 17.32	180.5 ± 17.70*	123.1 ± 19.28
Pregnancy rate	66.67 ± 11.43	50.0 ± 12.91	62.50 ± 12.50

- *P<0.05
- **P<0.01
- ***P<0.001
- † (dagger symbol) 0.05 <P<0.1 (trend)

DISCUSSION

The present study was carried out to gain more information under field condition, about studying the postpartum reproductive disturbance with special reference to subsequent reproductive fertility.

High reproductive performance can be achieved of the uterine involution completed at proper time postpartum. Uterine involution considered to be completed if both uterine horns returned to equal non–gravid size, in their normal location in pelvic floor **(Elmetwally, 2004)**.

In the present study uterine involution was completed at about 29.22 ± 1.64 days in normal Postpartum cows. This result agreed with **(Fonseca, et al., 1983, Miettinin 1990)** who mentioned that the moderate time required for uterine involution is evaluated clinically by rectal palpation take from 18 -25 days.Normal reduction in uterine size occur as a result of uterine contraction, vasoconstriction of blood vessels, physical shrinkage, necrosis, sloughing of caruncles and regeneration of the endometrium **(Gier and Marion 1968).**In this present study uterine involution was significantly increase in days in endometritis (33.80 ± 1.79), retained placenta(46.50 ± 2.36) and pyometra (45.0 ± 1.54) than control cows. In this study there is also significant decrease in uterine involution in $PGF_2\alpha$ group (29.13 ± 1.96) than oxy-ject 5% group (37.81± 1.58). This prolongation of uterine involution depend up on many factors such as age, time of year, abnormalities associated with calving such as dystocia, retained placenta, twins, endometritis and pyometra **(Eiler, 2007)**.

Uterine affection either postpartum endometritis or pyometra affect dairy cow industry as it lead to subfertility or fertility which represent in longer calving interval, increase the number of service per conception, days in milk until first service, increased number of culled cows **(Esslemont and Kossaibati 2002).**. Furthermore the present study showed a significant increase in days open and number of service per conception in groups of cows suffered from endometritis and pyometra compared to normal group cows. This result come in agreement with obtained by **(Le Blanc et al., 2002).**

Moreover, in the present study there is significant decrease in pregnancy rate in case of pyometra group (33.33 ± 12.60), retained

placenta group (40.0 ± 16.33) and endometritis group (40.0 ± 13.09) than control group (66.67 ± 11.43), also there is decrease in pregnancy rate in oxy-ject 5% group (50.0 ± 12.91) than $PGF_2\alpha$ group (62.50 ± 12.50) and this agreed with **(Salasel and Mokhtari 2011)** who reported that $PGF_2\alpha$ consider an effective treatment in uterine infection.

CONCLUSION

From the result of the present study it was concluded that postpartum reproductive performance in cows as uterine involution was delayed, increase the number of service per conception and days open and decreased pregnancy rate as a result of endometritis, retained placenta and pyometra compered to normal cows, ultrasonographic scanning play an important role in diagnosis and evaluation of uterine affection and different ovarian structure, $PGF_{2\propto}$ give good result for treatment of uterine affections more than oxy-ject 5%.

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الملخص العربي

تأثير المشاكل التناسلية بعد الولادة على الخصوبة اللاحقة فى ابقار الفريزن الحلوب

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تم دراسة تأثير اصابات الرحم (الالتهاب الرحمي، والالتهاب الرحمي الصديدى واحتباس المشيمة) خلال فترة النفاس علي الخصوبة حيث تمت هذه الدراسة علي ٩٠ بقرة واظهرت الابقار الطبيعية التي لا توجد بها اعراض ظاهرية للالتهابات الرحم استرجاع الرحم لوضعه وحجمه الطبيعي في خلال ٢٨,٩٤يوم وعدد التلقحات الازمة للخصوبة ٢,١١ وعدد الايام من الولادة الي الاخصاب ١٣١,٩ يوم ونسبة الحمل ٦٦,٦٧% بينما في حالات الالتهاب الرحمي تم استرجاع الرحم لوضعه وحجمه الطبيعي في خلال ٣٣,٨يوم وعدد التلقحات الازمة للخصوبة ٣,٢وعدد الايام من الولادة الي الاخصاب ١٧٧,٦يوم ونسبة الحمل ٤٠% بينما في الابقار التي تعاني من الالتهاب الرحمي الصديدي تم استرجاع الرحم لوضعه وحجمه الطبيعي في خلال ٤٥يوم وعدد التلقحات الازمة للخصوبة ٤,١٣ وعدد الايام من الولادة الي الاخصاب ٢٠٩يوم ونسبة الحمل ٣٣,٣٣% بينما في حالات احتباس المشيمة تم استرجاع الرحم لوضعه وحجمه الطبيعي في خلال ٤٦,٥يوم وعدد التلقحات الازمة للخصوبة ٤ وعدد الايام من الولادة الي الاخصاب ١٨٤,٧ يوم ونسبة الحمل ٤٠% وعندما عولجت الابقار التي تعاني من اصابات الرحم بمادة الاوكسي جكت ٥% تم استرجاع الرحم لوضعه وحجمه الطبيعي في خلال ٣٧,٨١يوم وعدد التلقحات الازمة للخصوبة ٢,٩٤وعدد الايام من الولادة الي الاخصاب ١٨٠,٥ يوم ونسبة الحمل ٥٠% اما في حالة الابقار التي تعاني من الاصابات الرحمية وتم عالجها بهرمون البروستاجلاندين ف٢ الفا تم استرجاع الرحم لوضعه وحجمه الطبيعي في خلال ٢٩,١٣يوم وعدد التلقحات الازمة للخصوبة ٢,٢٥ وعدد الايام من الولادة الي الاخصاب ١٢٣,١يوم ونسبة الحمل ٦٢,٥%. من الممكن استنتاج ان حالات اصابات الرحم مثل (الالتهاب الرحمي و الالتهاب الرحمي الصديدي و احتباس المشيمة) توثر بالسلب علي الاداء التناسلي مقارنة بالابقار الطبيعية وتعتبر مادة البورستاجلاندين ف٢ الفا علاج فعال في حالات الاصابات الرحمية عن مادة الاوكسي جكت ٥%.