

## **Clinical, Hematological and Therapeutical study of Puerperium Metritis in Holstein- Friesian Cows**

**دراسة سريرية، دموية وعلاجية لالتهاب الرحم النفاسي في ابقار الهولشتاين – فريزيان**

AL-Mohammed T.M<sup>1</sup>. , A. H. Mohammed<sup>2</sup>, and Al-shaty,E.R<sup>3</sup>.

<sup>1</sup>Asst. Professor , College of veterinary Medicine-Baghdad University.

<sup>2</sup>Lecturer, Foundation of Technical Education, Technical institute of AL-Mussaib.

<sup>3</sup>Asst. Lecturer, College of veterinary Medicine-Baghdad University.

### **Summary**

This study was performed on 56 Holstein-Friesian cows suffered from puer perium metritis in large station of animals (Gbalah) In Babylon governorate during the period of Januarys 2011- August 2012, their ages range from 3-6 years and the post partum period was 20-30 day , these cows were divided randomly into three groups according to the type of treatment that used . 1<sup>st</sup>group 15 cows injected with 750 µg of PGF2α (Estrumate) I.M. one dose, 2<sup>nd</sup> group 19 cows injected with 750 µg I.M. of PGF2α with 20 ml of Oxytetracyclin 20% I.M. in one dose, 3<sup>rd</sup> group 22 cows injected with 750 µg I.M. of PGF2α and 20 ml Pen-Strep I.M. in one dose (4 million i.u. of Penicillin mixed with 4 gm of Dehydrostrptomycine ).

The percentage of response animals were 73.2% (41/56) but The 2<sup>nd</sup> and 3<sup>rd</sup> group was significantly Superiors  $p < 0.01$  compared with 1<sup>st</sup> related with response to treatment while the Number. of services per conception was  $3.02 \pm 0.72$ ,  $3.15 \pm 0.43$  in 1<sup>st</sup> and 2<sup>nd</sup> compared with 3<sup>rd</sup> group recorded  $2.87 \pm 0.36$ , the days open in group 3 recorded significantly  $p < 0.01$  in compared with group 1 and group 2.

There is significant increase  $p < 0.01$  in the values of the hematological picture in group 2 compared with group 1 before and after treatment. We concluded that good result in using of PGF2α alone but when using with antibiotics was highly effective in the treatment of perperium metritis in Holstein-Friesian cows.

### **الخلاصة:**

اجريت الدراسة على 56 بقرة مضربة (هولشتاين- فريزيان) كانت تعاني من التهاب الرحم النفاسي في محطه تربيته الحيوانات الكبيره (جبلة) في محافظه بابل خلال الفتره كانون الثاني 2011- اب 2012 وكانت اعمارها تتراوح بين 3-6 سنوات خلال مدة 20-30 يوم بعد الولاده.

قسمت الحيوانات عشوائيا الى ثلاثة مجاميع طبقا لنوع العلاج المستخدم: ضمت المجموعة الاولى 15 بقرة عولجت بهرمون البروستاغلاندين بجرعة واحدة 750 مايكروغرام في العضلة. أما المجموعة الثانية فقد ضمت 19 بقرة عولجت بنفس الجرعة من البروستاغلاندين إضافة الى 20 مل من المضاد الحياتي الأوكسيتتراسايكلين 20% وبجرعة واحدة فقط .

أما المجموعة الثالثة فضمت 22 بقرة عولجت ببروستاغلاندين إضافة الى المضاد الحياتي بنسلين ستربتومايسين بجرعة ( 20 ) مل في العضلة مرة واحدة فقط ( 4 مليون وحدة دولية بنسلين ، 4 غرام ستربتومايسين). وتم تسجيل نسبة استجابة كلية للابقار في جميع المجاميع بلغت 73.2% (41/56) ، إلا أن أفضل استجابة سجلت في المجموعتين الثانية والثالثة مقارنة مع الاولى بمستوى  $P < 0.01$  . أما عدد التلقيحات اللازمة للاخصاب فقد كانت في المجموعتين الاولى والثانية  $3.02 \pm 0.72$  و  $3.15 \pm 0.43$  على التوالي مقارنة مع المجموعة الثالثة والتي بلغت  $2.87 \pm 0.36$  . أما ما يخص معدل الايام المفتوحة فقد سجل فارق احصائي بمستوى  $P < 0.01$  لصالح المجموعة الثالثة مقارنة بالمجموعة الاولى والثانية، كما سجلت المجموعة الثانية فارق احصائي بمستوى  $P < 0.01$  مع المجموعة الاولى فيما يخص القيم الدمية قبل وبعد العلاج.

نستنتج هذه الدراسة أن استخدام البروستاغلاندين لوحده ذا تأثير مهم ولكن عند استخدامه مع المضادات الحيوية يكون أكثر فعالية في علاج حالة التهاب الرحم النفاسي في ابقار الهولشتاين الفريزيان.

### **Introduction**

Puerperal metritis is one of the most a reproduction disorder affecting Dairy cattle and Beef cattle (1, 2). It results in heavy economic loss due to decreased milk production, reduced fertility and high treatment cost (3, 4).

The incidence of the disease is generally high (20- 40%) and it can range between 10%- 80% depending on various internal or external factors as well as diagnostic methods (5,6,7,8) .

The absence and a low level individual monitoring of cows in large herds cause many affecting cows to remain undiagnosed (9, 10). Various agents have been used to treat this condition from time to time which includes hormonal treatments PGF2 $\alpha$  or antibiotics involve Oxytetracycline, Penicillin, Sulfonamide (11,12). PGF2 $\alpha$  and its analogues have been advocated in managing post partum metritis, the rationale for using PGF2 $\alpha$  includes stimulation of uterine contraction, which aids in expulsions purulent uterine discharge and debris, stimulation of leukocytes and leucolysis with induction of an estrous cycle (2, 13, 14), PGF2 $\alpha$  increase vascularity ratio of uterus and when a large amount of blood come to uterus that means high ratio of W.B.C. inter in the uterus and phytocytotic pathologic agent begin(15).The hematological values of the animals may show variation according to changes in the normal physiological activities of the body or due to pathological disorders (16, 17, 18).

The purpose of this study to investigate the effect of different antibiotic regimes of treatment and its response to treatment, number of services/ conception and days open in cows and evaluating the subsequent hematological values before and after treatment.

### **Materials and Methods**

The study was performed on 56 Holstein- Friesian cows suffered from purperium metritis in large station of animals (Gbalah) in Babylon Government during the period of January 2011- August 2012 their ages ranges from 3-6 years and the post partum period was 20- 30 days diagnosed clinically by rectal palpation and observed the muco-purulent vaginal discharge these animals were divided randomly into three groups according to the type of treatment used.

The 1<sup>st</sup> group include 15 cows injected single dose with 750  $\mu$ g of PGF2 $\alpha$  I.M.(Estrumate: Chering PLough Animal health- Germany ).2<sup>nd</sup> group include 19 cows injected with 750  $\mu$ g of Estrumate and 20 ml./cow I.M. one dose only of Oxytetracycline : CoopH VET- Cedex-Francebn. The 3<sup>rd</sup> group include 22 cows injected with 750 $\mu$ g of Estrumate and 20 ml./cow I.M. of Pen-Strep.: Kelaonoy Hoogstren Belgiumo. one dose only (4 million i.u. of Penicillin mixed with 4gm Dehydrostreptomycine).

Number of responsive cows, duration of response after treatment, Number of insemination per conception and days open were recorded, 5ml of blood samples were taken in tubes containing anticoagulant (EDTA) from the jugular vein before treatment and another same samples after treatment. Total RBCs count was determined by using the Improved Neubaur Haemocytometer according to (19).

Hemoglobin was estimated by using spectrophotometric method, PCV was achieved by using Microhaematocrit; WBC was counted using Improved Neubaur haemocytometer and the differential count of WBC was using Giemsa stain .The statistical analysis includes mean, standard deviation, Chi- Square Student test (F- test) according to (20, 21).

### **Results:**

The results were revealed in table 1 and 2. Table-1- represented the response animals to the program of treatment and showed that the treatment was using PGF2 $\alpha$  (Estrumate)750  $\mu$ g /cow I.M. in 1<sup>st</sup> group only or with 20 ml (4gm) of 20% Oxytetracyclin I.M. in the 2<sup>nd</sup> group or with 4 million and 4gm from Penicillin-Streptomycin (pen-strep) in the 3<sup>rd</sup> group.

The response recorded 66.6%(10/15),73.6(14/19) and 77.2% (17/22) in the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> group respectively while the Number of services per conception recorded  $3.02 \pm 0.72$  / $3.15 \pm 0.43$  and  $2.87 \pm 0.36$  respectively .

Finally the days open was  $124.26 \pm 9.66$ ,  $115.23 \pm 8.62$  and  $103.15 \pm 8.49$  respectively also. Table 2 shows the hematological values before and after treatment, in which RBCs count, Hb, PCV, MCV and MCH , MCHC ,WBC before treatment were  $5.76 \pm 0.93$ ,  $9.97 \pm 0.15$ ,  $27.81 \pm 0.45$ ,  $48.29 \pm 0.59$ ,  $17.36 \pm 0.17$ ,  $36.05 \pm 0.48$ , and  $9.06 \pm 1.10$  respectively, while the differential count of WBC before treatment was  $56.32 \pm 0.75$ ,  $38 \pm 0.60$ ,  $1.89 \pm 0.28$ ,  $1.41 \pm 0.21$  and  $1.18 \pm 0.04$  which represented Neutrophil, Lymphocyte, Monocyte ,Esinophil and Basophil respectively, while the

values of hematological parameters after treatment (response animals) were  $6.07 \pm 0.57$ ,  $10.35 \pm 0.75$ ,  $28.91 \pm 0.66$ ,  $47.57 \pm 0.77$ ,  $17.05 \pm 0.94$ ,  $32.59 \pm 0.60$ ,  $8.86 \pm 0.64$  but the values of differential counts of WBC were recorded after treatment  $53.05 \pm 0.28$ ,  $36.88 \pm 0.91$ ,  $1.60 \pm 0.13$ ,  $1.52 \pm 0.32$  and  $1.15 \pm 0.07$  respectively like above.

Table-1- The type of treatment response animals, number. of services per conception and days open in Holstein-Friesian cow

Groups	Number. of animals	Type of treatment	Response animal Number. %	Number.of services/conception M $\pm$ SE	Days open M $\pm$ SE
G1	15	PGF2 $\alpha$ 750 $\mu$ g /cow I.M.	10/15 a 66.6	$3.02 \pm 0.72$ a	$124.26 \pm 9.66$ a
G2	19	PGF2 $\alpha$ 750 $\mu$ g/cow I.M. + 20ml. Oxytetracycline 20%	14/19 b 73.6	$3.15 \pm 0.43$ a	$115.23 \pm 8.62$ b
G3	22	PGF2 $\alpha$ 750 $\mu$ g/cow I.M.+ 20ml.Pen-Sterpt. (4million+4gm.)	17/22 b 77.2	$2.87 \pm 0.36$ b	$103.15 \pm 8.49$ c
Total	56	-----	41/56 73.2	-----	-----

\*Different letters Significant P<0.01

Table-2- Hematological values before and after treatments in Holstein-Friesian cow:

Blood Parameters	Values before treatment	Values after treatment (Response animals)
RBCs $\times 10^6$ ml	$5.76 \pm 0.93$ a	$6.07 \pm 0.57$ b
Hb (g/100 ml.)	$9.97 \pm 0.15$ a	$10.35 \pm 0.75$ b
PCV %	$27.81 \pm 0.45$ a	$28.91 \pm 0.66$ b
MCV (fl)	$48.29 \pm 0.59$ a	$47.57 \pm 0.77$ b
MCH (pg)	$17.36 \pm 0.17$ a	$17.05 \pm 0.94$ a
MCHC (g/100 ml.).	$36.05 \pm 0.48$ a	$32.59 \pm 0.60$ b
WBC $\times 10^3$ /ml	$9.06 \pm 1.10$ a	$8.86 \pm 0.64$ b
Neutrophil %	$56.32 \pm 0.75$ a	$53.05 \pm 0.28$ b
Lymphocytes %	$38.60 \pm 0.60$ a	$36.88 \pm 0.91$ b
Monocytes%	$1.89 \pm 0.28$ a	$1.60 \pm 0.13$ b
Esinophil %	$1.41 \pm 0.21$ a	$1.52 \pm 0.32$ a
Basophile%	$1.18 \pm 0.04$ a	$1.15 \pm 0.07$ a

\*Different letters Significant P<0.01

**Discussion:**

The percentage of response animals were was 73.2% (41/56) ,these response seems to be to the role of PGF2 $\alpha$  leutolysis of the corpus leuteum and induction of an estrous cycle (increased estrogen) then the progesterone decline and the defense mechanism of uterus was increased and evaluating the uterine contents by increasing the contractility of uterine muscle and reducing uterine infection (2,13,15), and the effect of antibiotics includes Oxytetracycline or Pen-Sterp. its maintenance therapeutics levels in uterus more than 48hrs than other antibiotics due to effects of broad spectrum antibiotics and this results agreement with (8,11,12). While the superior results recorded with using PGF2 $\alpha$  and antibiotics  $P<0.01$ , compared with PGF2 $\alpha$  only, but the Number. of services per conception was recorded significantly higher  $P<0.01$  in group 3 compared with group 1 and2. (2,6,9,11).

The days open recorded significantly higher  $P<0.01$  in group 3 compared with group 1 and 2 also the significant  $P<0.01$  was recorded between group 1and2 and superiority associated with group 2 due to used antibiotics (7,8,16,17).

In table-2- The parameters of hematological examination showed a significant increase in the RBCs counts in the animals after treatment compared with animals before treatment as well as Hb concentration,PCV,MCV,MCHC and WBC counts ,while the differential counts increase ( significant  $P<0.01$ ) in Neutrophil ,Lymphocytes, Monocytes, this variations may be due to changes in the normal physiological activities as results of pathological disorder (purperium metritis) and this result agreement with many authors (16,17,18,19).

We concluded from this study that the PGF2 $\alpha$  (Estrumate) using alone or combination with antibiotics was highly effective in the treatment of purperium metritis in Holstein- Friesian cows associated with improvement in some reproductive criteria e.g. Number of services per conception and days open.

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Key word: Holstein-Friesian, Metritis, PGF2 $\alpha$ , oxytetracine, pen-strept.

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