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Hormonal Treatments For The Retained Placenta in Iraqi Cows

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Abstract

The objective of the study was to assess some hormonal treatments used to treat retained placenta, and which method of treatment is more efficient than others.in Iraqi cows. The study was carried out in both Diyala and Saladin provinces and expanded from 5/10/2020 to 5/12/2023, and included 60 cows have many parturitions experiencing retained placenta after parturition. The treated cows divided into two categories, the first category consists of 25 cows and these have been treated with estradiol and oxytocin hormones for one time. The second category consists of 35 cows and treated with prostaglandin F2α (PGF2α) for one time. 12 (48%) cows from first category responded to the treatment by estradiol and oxytocin, and the placenta were expelled. Whilst 25(71.4%) cows from second category responded to the treatment by PGF2α. With significant difference between two categories toward PGF2α treatment at P< (0.05). 7 (58.3%) cows from 12 responded cows in the first category became pregnant later, whilst 19(76%) cows from 25 responded cows in the second category became pregnant later. With significant difference between two categories in aspect of pregnancy at P< (0.05). The pregnancy rate in non-responded animals in the first category was (61.5%) whereas the rate of pregnancy in non-responded animals in the second category was (60%) without significant difference between two sub-groups at P< 0.05.

It can be concluded the hormonal treatments for retained placenta by using PGF2α was more efficient in comparison with estradiol and oxytocin and both types of hormonal treatments were reliable in treating retained placenta in cows.

Key words : Cows, Retained placenta, Hormonal treatment, Fertility

Introduction

Retained placenta (RP) is one of the important genital diseases in cow that occur after parturition. The failure to eject placenta within twelve to twenty-four hours is considered as retained placenta or retention of fetal membranes (RFM)(1, 2). Failure of dehiscence and absence of fetal membranes evacuation during the physiological third stage of labor were features of this illness case. Whereas secondary retention is linked to a mechanical problem in evacuating already detached fetal membranes, such as uterine inertia, primary retention of fetal membranes is caused by a lack of detachment from the maternal caruncles. (3). Delay in first service was one of the negative effects of (RP) on cattle reproductive performance. (4), decrease of pregnancy rate (5), and rise in services or inseminations per conception (6).

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The (RFM) also result in puerperal metritis, endometritis and mastitis (7), these diseases consequently cause the decrease in the fertility and or milk production of cattle (8). The rate of occurrence of retention of placenta is more common in multiparous animals, and the occurrence of retained placenta become bigger in older cows with parity over fourth (9).

The maximum hormone products involved in treating (RP) are oxytocin, estradiol and Prostaglandin F2α (PGF2α). These hormones appear to play a part in uterine contractions and may help with cases of placental retention (10). After delivery, oxytocin has long been utilized to remove the placenta (3). The best hormone to treat retained placenta in the early postpartum phase is oxytocin, which seems to have uterokinetic properties(11), and supporting the process of uterine involution (12). By speeding up the transcription of the oxytocin receptor gene, whereas estradiol hormone helps to enable it. (13). The effect of PGF2α could be explained that PGF2α enhances uterine contractions in addition to dilatation of the cervix, both of which facilitate placental expulsion (14).

Materials and Methods

The study has been conducted in Diyala and Saladin provinces in Iraq, at a period extends from 5/10/2020 to 5/12/2023, and included 60 multiparous cows suffering from retained placenta after parturition. All these cows bred and housed in small farms. All cows fed on concentrated food and green fodder, in addition to the roughages. These cows came to the veterinary clinics spread throughout both provinces. After taking case history for these cows, they allocated into the following two groups: (Group-1): this group consists of twenty-five cows which treated hormonally by injecting intra-muscularly (IM) (6mgs) (3ml) of estradiol hormone (Vetasterol (oily solution, each ml contains 2 miligrams Estradiol Benzoate (Base)), Aburaihan Pharma Company. Iran). Plus (5ml) (50 IU) of oxytocin hormone(Oxytocin 10% (injectable solution , each ml contains 10 IU oxytocin)(Dutch Farm International BV, Holland) for one time.

Twelve cows responded to the treatment with complete remove of retained placenta and came in estrus about 55-62 days after treatment, and artificially inseminated. Seven cows became pregnant after making rectal palpation for pregnancy diagnosis 60 days after artificial insemination (AI). Five cows return to estrus after 21-22 days of insemination, re-inseminated secondly, and became pregnant after 60 days of artificial insemination through rectal palpation method for pregnancy diagnosis.

Thirteen cows have not to be responded to this kind of treatment, and the retained placenta were removal manually and then put five tablets containing oxytetracycline (each tablet has 500 miligrams of oxytetracycline, ALSHARK Veterinary products, Syria) intra-uterine after placental remove, and injected 4 grams of oxytetracycline 20% solution (Imoly 20% (solution, each ml containing 200 mg oxytetracyclin, Intracin Co. LTD, India) by intramuscular route for one time. All the cows came to estrus within 72-81 days of treatment with complete clinical recovery and inseminated artificially. Eight cows became pregnant when the rectal palpation made for pregnancy diagnosis after 60 days of artificial insemination. Five cows return to estrus after 22-24 days of insemination, re-inseminated secondly, three cows were pregnant when the rectal palpation for pregnancy diagnosis after

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60 days of last insemination was done. Two cows return to estrus 21-22 days of last insemination and inseminated artificially thirdly after intra-uterine injection of (20 ml) 4 million IU of procaine penicillin (KELA nv, Sint Lenaartseweg 482320 Hoogstraten-Belgium), each ml contains 200.000 IU procaine penicillin and 200 mg dehydrosreptomycin), and these cows have become pregnant after rectal palpation for pregnancy diagnosis that was carried out after 60 days of third artificial insemination.

(Group- 2): this group consists of thirty-five cows treated hormonally by injecting intramuscularly of PGF2α(Alfaglandin (solution contains 250 micrograms cloprostenol sodium(alfasan WOERDEN-HOLLAND) (500 micrograms (mcg)) (2ml) for one time. twenty five cows have good response to the treatment with complete remove of retained placenta and inter in estrus after 50-60 days of treatment and were inseminated artificially. Nineteen cows became pregnant when the rectal palpation was made for pregnancy diagnosis after 60 days of AI. Six cows return to estrus after 20-24 days of AI, re-inseminated secondly and became pregnant when the rectal palpation was done for pregnancy diagnosis after 60 days of AI. Ten cows had no response to this treatment and the retained placenta were removed manually and put five tablets containing oxy-tetracycline (each tablet containing 500 miligrams oxytetracycline HCL, ALSHARK Veterinary products, Syria) intra-uterine after placental remove, and injected intramuscularly (4 grams) of oxy-tetracycline 20% (Imoly 20% (solution, each ml contains 200 mg oxytetracyclin, Intracin Co LTD, India) for one time. All these cows came to estrus within 65-75 days post treatment with complete clinical recovery and inseminated by AI. Six cows became pregnant when the rectal palpation made for pregnancy diagnosis after 60 days of AI. Four cows return to estrus after 18-25 days of insemination, re-inseminated secondly. Three were pregnant when the rectal palpation for pregnancy diagnosis after 60 days of last insemination. One cow return to estrus 21 days of last AI, and inseminated artificially thirdly after intra-uterine injection of 4 million international units (20 ml) penicillin and this cow has become pregnant after rectal palpation for pregnancy diagnosis that was made after 60 days of third artificial insemination.

Statistical analysis

The statistical studies were conducted utilizing IBM SPSS Inc.'s version 18.0 software, located in Chicago, USA. The normal distribution of the qualities under investigation is verified using the Shapiro-Wilk test. Statistical analysis was performed on all outcomes using (χ 2) at the probability level of $p < 0.05$. (15).

Results

Table (1) shows the number of treated cows which is 60 multiparous cows. (25) Cows treated with estradiol and oxytocin hormones, 12 (48%) of these cows responded to this method of treatment by complete remove of retained placenta. 35 cows treated with prostaglandin F2α (PGF2α). 25 (71.4%) responded to this method of treatment by complete remove of retained placenta. There is significant difference between two methods of treatments toward treatment by prostaglandin (PGF2α) at $P<0.05$.

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Table (1): Response retained placenta multiparous cows to hormonal treatments.

Treated cows	No. of cows	Response	Non-response
Estradiol +Oxytocin	25	12 (48%) [a]	13 (52%) [a]
Prostaglandin F2α	35	25 (71.4%) [b]	10 (28.6%) [b]
	60	37	23

[ab] indicates different superior's letters within columns show a significant difference at $P < 0.05$.

Table (2) shows the rate of pregnancy in the two methods of treatment groups. 7 (58.3%) of responded cows belong to the first method of treatment group became pregnant, whereas 19 (76%) of responded cows belong to the second method of treatment group became pregnant, with significant difference between two groups in aspect of pregnancy rate at $P< 0.05$.

Table 2: Pregnancy rate in response of treatments groups.

Response treated cows	No. of cows	Pregnant cows	Non pregnant cows
Estradiol +Oxytocin	12	7 (58.3%) [a]	5 (41.7%) [a]
Prostaglandin F2α	25	19 (76%) [b]	6 (24%) [b]
	37	26	11

[ab] indicates different superscripts letters within columns show a significant difference at $P < 0.05$.

(60%) un-responded cows of second method of treatment group became pregnant, without significant difference between these two groups in aspect of pregnancy rate at $P< 0.05$.

Table (3) shows the rate of pregnancy in un-responded cows in two groups of treatments. 8 (61.5%) un-responded cows of first method of treatment group became pregnant, whilst 10

Table 3: Pregnancy rate in non-response treatments groups.

Un-responded treated cows	No. of cows	Pregnant cows	Non pregnant cows
Estradiol + Oxytocin	13	8 (61.5%)	5 (38.5%)
ProstaglandinF2α	10	6 (60%)	4 (40%)
	23	14	9

There is no significant difference $p < 0.05$ between two groups in pregnancy rate

Discussion

ProstaglandinF2 α (PGF2α) showed the best results in treating retained placenta as showed in the table (1), in comparison with another method of treatment (Estradiol and oxytocin). Similar results have been reported by other workers (14, 16, 17). PGF2α

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exerted its impact by augmenting the contraction of the uterine muscles and dilation of the cervix, both of which improve the evacuation of the retained placenta. (18, 19). These results provision the findings of Gross et al. (20) where they showed that, at least in the forced calving model, injecting PGF2α within an hour after giving birth effectively reduces the incidence of placental retention. The group that received treatment with estradiol plus oxytocin showed an efficacy of 48%. Oxytocin is well known to play a beneficial role in placenta droppage by increasing uterine leukocyte phagocytosis, which may account for our findings. (21, 22). Estradiol hormone facilitates oxytocin receptor gene transcription by increasing it more rapidity (13).

The results showed in the table (2) revealed to the highly rate of pregnancy in cows treated by PGF2α, which was (76%). These findings agreed with several studies indicated to the increasing the conception rate in the cows suffering from retained placenta and treated hormonally by PGF2α (23, 24, 14). PGF2α is particularly successful in promoting enhanced reproductive function, faster uterine involution, a lower risk of post-partum metritis, and quick placental shedding.(23, 24). The rate of pregnancy in retained placenta cows treated with estradiol and oxytocin hormones was (58.3%) as mentioned in the table(2) and these ratios related to the methods of hormonal treatments which seems to be high relatively and may attributed to the role of ecbolics (PGF2α, estradiol and oxytocin) used in the study in increasing uterine tone, and contractions which may facilitate the dropping of retained placenta and enhancement of uterine involution and decreasing the opportunity of post-partum metritis (25, 3, 24). The efficacy of these hormones in detachment and dropping the retained placentas in the study revealed these cases of retained placentas may be due to the uterine atony which, is apparent or common in the multiparous cows and in cows are bred in small farms or house holding breeding and these cows may experiencing nutritional and mineral deficiencies lead to the uterine atony.

The pregnancy rate of un-responded cows to the methods of hormonal treatments were 61.5%, 60% respectively as showed in table (3), without significant difference between two methods of hormonal treatments. These cows treated by manual removal of retained placenta with inserting oxytetracycline intra-uterine and injecting oxytetracycline and penicillin systemically. These results supported many studies showed that the use of the hormonal treatments of retained placenta didn't prevent the incidence of uterine inflammation (3, 18, 25), hence the failure of detachment of retained placenta after hormonal treatment would justify the use of antibiotics like oxytetracycline either intrauterine injection or systemically after removal of retained placenta with variable results (26, 27). The use of oxytetracycline in this study was effective after the removal of retained placenta where it is used as intra-uterine inserting, besides to the usage of systemically administration of oxytetracycline and penicillin in the study. Both two antibiotics lead to the recovery of the inflamed uterus, and participated in return the retained placenta cows to the reproductive performance. These findings are in agreement with several studies revealed to the efficacy of these antibiotics in treating retained placenta after the manual removal (3,11, 18, 26), and many studies recommended the use of oxytetracycline as intra-uterine therapy in account of its

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antibacterial spectrum and its facility to retain its antibacterial characteristics in the presence of organic material (28).

Conclusion: the study concluded the hormonal therapies by usage of both estradiol, oxytocin and prostaglandin F2α was effective in treating retained placenta in multiparous cows and the fertility of hormonal treated cows was high and this may attributed to these cases were in account of uterine inertia or hormonal imbalance.

References

1- Satish, D.K., Purohit, G.N. (2019). A Discussion on Risk Factors, Therapeutic Approach of Endometritis and Metritis in cattle. Int. J. Curr. Microbiol. App. Sci., 8(5):403-421.

2- Semivolos, A.M., Molchanov, A.V., Rykhlov, A.S., Krivenko, D.V. & Egunova, A.V. (2018). A New Method for Treatment of Retained Placenta in Cows. J. Pharm. Sci. & Res., 10(5): 1256-1258.

3- Tucho, T.T. (2017). Review on Retention of Placenta in Dairy Cows and it is Economic and Reproductive Impacts. Journal of Natural Sciences Research. 7(7):28-37.

4- Stevens, R.D., Dinsmore, R.P. (1997). Treatment of dairy cows at parturition with prostaglandin F2a or oxytocin for prevention of retained fetal membranes. J. Am. Vet. Med. Assoc., 21: 1280-1284.

5- McDougall, S. (2001). Effects of peri-parturient diseases and conditions on the reproductive performance of New Zealand dairy cows. NZ. Vet. J., 49: 60 – 68.

6- Holt, L.C., Whittier, W.D. & Gwazdauskas, F.C. (1989). Early postpartum reproductive profiles in Holstein cows with retained placenta and uterine discharges. J. Dairy. Sci., 72: 533-539.

7- Bruun, J., Ersb, A.K. & Alban, L. (2002). Risk factors for metritis in Danish dairy cows. Prev. Vet. Med., 54: 179-190.

8- Laven, R.A. & Peters, A.R. (1996). Bovine retained placenta: Aetology, pathogenesis, and economic loss. Vet.Rec., 139: 465 – 471.

9- Sharma, M., Bhat, Y., Sharma, N. & Shriya, R. (2017). Effect of Parity of Animal and Season of Year on the Rate of Retention of Placenta in Dairy Cattle. Int. J. Curr. Microbiol. App. Sci., 6 (12):3103-3108.

10- Patel, R.V. & Parmar, S.C. (2016). Retention of Fetal Membranes and its Clinical Perspective in Bovines. *Sch. J. Agric. Vet. Sci*., 3(2):111-116.

11- Abdisa, T. (2018). Review on the reproductive health problem of dairy cattle. Vet Sci J., 5(1):1-12.

12- Waheeb, R.S.; Hussein, F.M., El-Amrawi, G.A. & El-Hammady, E.A. (2015). Retained fetal membranes in Holstein cows: Economical evaluation. Journal of International Scientific Publications: Agriculture and Food. 2: ISSN 1314-8591. (Online), published at: http://www.scientific-publications.net.

13- Leung, S.T. & Wathes, D.C. (2000). Oestradiol regulation of oxytocin receptor expression in cyclic bovine endometrium. J. Reprod. Fertli. , 119: 287- 292.

14- Majeed, A.F., Aboud, Q.M., Hassan, M.S. & Mohammad, A.Y. (2009). Retained fetal membranes in Friesian-Holstein cows and effect of some treatment method. Iraqi Journal of Veterinary Sciences. 23. Supplement: 5-8.

15- SPSS software. (Version 18.0, IBM SPSS Inc.2018; Chicago: USA).

16- Noakes, D.A., Parkinson, T.J. and England, C.C.W. (2001) Veterinary Reproduction and Obstetrics. 8th Ed., Saunders Co.

17- Studer, E. & Holtan, A. (1986). Treatment of retained placenta in dairy cattle with prostaglandin. Bovine Pract., 21: 159- 160.

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18- Paisley, L. G., Mickelson, W. D. & Anderson, P. B. (1986). Mechanisms and therapy for retained fetal membranes and uterine infections of cows: A review. Theriogenology, 25: 353- 381.

19- Hafez, B. & Hafez, E. S. E., (2000). Reproduction in farm Animals. 7th Ed. Lippincott Williams and Wilkins, Co., Philadelphia, U.S.A.

20- Gross, T. S.; Williams, W. F. & Moreland, T. W. (1986). Prevention of the retained fetal membrane calving in dairy cattle. Theriogenology, 26: 365-370.

21- El- Azab, E. A., El- Azab, M. A., Sharawy, S. M., & Labib, F. M. (1988). Evaluation of various uterotonic single treatments for prophlayxis of retained placenta in dairy cows. Assiut. Vet. Med. J., 19: 166- 172.

22- Vandeplassche, M. & Bouters, R. (1983). Phagocytosis in the blood and uterine exudates in mares, cows and sows. Proc. III rd Int. Sympos. World Ass. Vet. Lab. Diag. Ames. Iow., I: 83-89.

23- Rohmah, S., Ratnani, H., Hadi, S.,Warsito, S.H., Rimayanti, R.; Madyawati, S.D., Mulyati, S. and Hasib, A.(2023). Retained placenta in dairy cows living in an all-day cowshed rearing system. Ovozoa 12: 68-76.

24- Amin, Y.A.; Elqashmary, H.A., Karmi, M. & Essawi, W.M. (2023). Different protocols in treatment of placental retention in dairy cows and their influences on reproductive performance. Reprod. Domest. Anim. 58(8):1114-1124.

25- Yusuf, J.J. (2016). A Review on Retention of Placenta in Dairy Cattles. Inter J Vet Sci, 5(4): 200-207.

26- Beagley, J.C., Whitman, K.J., Baptiste, K.E. & Scherzer, J. (2010). Physiology and Treatment of Retained Fetal Membranes in Cattle. J Vet Intern Med., 24:261–268.

27- Sahlu, B. W. (2015). Assessment of Major Reproductive Problems of Dairy Cattle in Selected Sites Of Central Zone Of Tigrai Region, Northern Ethiopia. A Master of Science Thesis, Mekelle, Ethiopia.

28- Biner, B., Bischoff, M., Klarer, F., Suhne, F., Hüsler, J. & Hirsbrunner, G. (2015). Treatment of Retained Fetal Membranes: Comparison of the Postpartum Period after Routine Treatment or Routine Treatment Including an Additional Phytotherapeutic Substance in Dairy Cattle in Switzerland. Open Journal of Veterinary Medicine, 5: 93-99.