Treatment of anoestrus local Iraqi buffaloes (Bubalus bubalis) using different hormones - field study

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Summary

This study aimed to evaluate the efficacy of different hormonal treatments protocols ($PGF_{2\alpha}$,GnRH, estradiol and progesterone) hormones on reproductive performance of postpartum anoestrus native dairy River buffaloes (Bubalus bubalis), endemic south of Baghdad under field conditions . Present study was conducted on 128 animals that had postpartum anoestrus (PPA) for a period between 4 to 8 months. The animals were subjected to two experiments according to the type of anoestrus. In the first experiment 94 animals (73.5%) with persistent corpus luteum on their ovaries without any signs of estrous (sub-oestrus) were classified into two sub-groups.Sub-group1 (n=47) treated with $PGF_{2\alpha}$ hormone alone and sub-group 2 (n= 47) were treated by two injections. The first injection was $PGF_{2\alpha}$. while the second injection GnRH+ $PGF_{2\alpha}$ was injected after 9 days.In second experiment 34 buffalo cows without any structure on their ovaries (True anestrous) were classified into two sub-groups according to design of the treatment. Sub-group 1(n=14) was treated with estradiol as single injection. Sub-Group 2(n=20) received estradiol + progesterone .The results indicated that the pregnancy rate in sub- groups1 and 2 of the first experiment were 85.1% and 89% respectively , which was not significantly differ from each other ($P < 0.05$). While in the second experiment, the pregnancy rate for the first and second sub- groups were 71% and 75%, respectively. This study concluded that the prevailing situation of anestrous in postpartum buffaloes endemic south of Baghdad is anestrous with corpus luteum (Sub-oestrus) , 94 out of 128 (73.5%) , and the most efficient treatment protocol of these case are $PGF_{2\alpha}$ + GnRH hormones (pregnancy rate= 89%) . While estradiol + progesterone treatment are efficient in the treatment of animals suffering from true anestrous (pregnancy rate 75%).

Key words: Estrogenin, PGF2*α*, GnRH, Buffalo.

Introduction

Buffalo's productivity depends largely on reproductive efficacy, and it is often measured by number of off spring per breeding animal. It should be breed with 80-90 day after parturition to produce a calf and start a new lactation every 13 - 13.5 months (1). More over long inter calving period intervals in Buffaloes are mainly due to prolonged postpartum anestrus which is mainly attributed to ovarian inactivity or dysfunction (2).

True anestrous condition is associated with presence of static ovaries while sub-oestrus is related with persistent of corpus luteum (3). Postpartum anestrous is affected by several factors such as nutrition , milk yield , body condition score (Bcs) suckling, parity, calving season , healthy condition and other factors as documented (4). During the last few years, several studies have been attempted to treat the prolonged postpartum anestrous in buffaloes using hormonal treatment (5 and 6).

Previous studies mentioned above, have suggested that after estrous was induced, conception rate increased at the time of artificial or naturally insemination. The ovary is usually non-functional during the postpartum period since treatment with exogenous hormones which initiate ovarian function indicates that the endogenous hormones not being secreted. The aim of this study is to evaluate the efficacy of GnRH, $PGF_{2\alpha}$, estradiol and progesterone on postpartum an estrous dairy buffaloes.

Materials and Methods

The present study was carried out with 128 river buffaloes cows *Bubalus Bubalis* Iraqi breed , body weight 500 – 750 kg at the age of 4-8 years average parity 2.48 - 10.2 and body condition scores(Bcs) (2.0- 3.5) by the scale

(1-5). The average daily milk production was (6.5 ± 0.5 kg) with milking morning and evening. The animals with normal parturition, complete uterine involution and lack of endometritis during the experiment period which was conducted from January to December 2012. The animals were severed with postpartum anestrous for 4 to 8 months after 60 day of calving, divided into two experiment according to the ovarian findings. Experiment 1 included cows with persistent corpus luteum (sub-oestrus) while experiment 2 cows without any structure on their ovaries (true anestrous).

Experiment 1, cows had persistent corpus luteum on their ovaries without any signs of estrous (sub-oestrus, n=94). The animals were classified into two sub-groups.sub-group1 (n=47) received treatment $PGF_{2\alpha}$ analogue 3ml/ IM (Estrumate each ml contains 263 micrograms cloprstenol sodium intervet, Holland), sub-group 2 (n= 47) were treated by two injections. The first injection 3ml Estrumate (Synthetic $PGF_{2\alpha}$).while the second injection of 2ml GnRH+2ml $PGF_{2\alpha}$were injected after 9 days. In second experiment buffalo cows without any structure on their ovaries (True anestrous) (n = 34). The animals were classified into two sub-groups according to design of the treatment.Sub-group 1 was treated with estradiol as single injection. Sub-Group 2 received estradiol 2 ml + progesterone 2 ml (Table 2).

The data were analyzed using the chi – square test. A value of ($p<0.05$) was considered statistically significant.

Table, 1:Efficiency of different protocols on pregnancy rate in postpartum anoestrus buffaloes (persistent corpus luteum)

Treatment	Number of natural in seminatio n animal	Pregnancy rate
$PGF_{2\alpha}$ $PGF_{2\alpha}$ at day zero +($PGF_{2\alpha}$+GnRH at day 9)	**47 47**	**85.1% (40/47) 89% (42/47)**

Results and Discussion

In the present study, sub-estrous buffaloes with active corpus luteum in experiment 1, which represents 73.5% of all animals in this study, showed the pregnancy rate of 85.1%, 89% in sub-groups 1 and 2 respectively (Table 1).Present results are higher than the results reported by the (7 and 8) in buffaloes 65% and 22% respectively and also higher than that obtained by (9) 71% in cows. This may be due to , poor body condition score ,nutritional status ,Age, parity , species , prolonged (PPA).These results also indicate that the prevailing situation of anoestrus in postpartum native dairy river buffaloes is anoestrus with corpus luteum (Sub-estrus) .

The combination of $PGF_{2\alpha}$+ GnRH appeared to be efficient in treatment of sub-oestrus buffaloes in experiment 1 this can be explained by the fact that $PGF_{2\alpha}$ increase pituitary response to GnRH in the postpartum cow (10) hence GnRH cause rapid secretion of LH and FSH from the pituitary with subsequent elevation of the concentration of these hormones in peripheral blood (11)

The result in Table 2) showed that the pregnancy rate in sub-groups 1and 2 of 71.7% and 75%, respectively higher than that reported by (12) which obtained (31.8%) may be due to different factors such as (nutritional status, species, source of drug, (Bcs).Present results agree with (13) reported that the pregnancy rate 71.45% in She buffaloes.The increased circulation concentration of progesterone or estradiol after treatment in experiment 2, may induce negative feedback mechanism by increased sensitivity of hypothalamus - pituitary-gonad syetem (14). Following termination of therapy the rapid drop in circulation of this two hormones (estradiol+ progesterone) promotes the release of GnRH , followed by FSH and LH release with subsequent resumption of ovarian acyclicity lead to increase the intensity of heat and conception rate.

In conclusion: the efficiency of combination progesterone and estradiol in treatment of true anoestrus in buffaloes.

Table, 2: Effect of different treatment protocols on pregnancy rate in postpartum anestrous buffaloes (true anestrous)

Treatment	Number of natural in semination animal	Pregnancy rate
Estradiol	**14**	**71% (10/14)**
Estradiol + progesterone	**20**	**75% (15/20)**

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معالجة انعدام الشبق في الجاموس العراقي المحلي باستخدام هرمونات مختلفة - دراسة ميدانية

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الخلاصة

تهدف هذه الدراسة لتقييم فعالية بروتوكولات علاجية هرمونية مختلفة ($PGF_{2\alpha}$,GnRH، استراديول والبروجسترون) على جواميس النهر العراقية المحلية المنتجة للحليب *Bubalus bubalis*, المستوطنة في مناطق جنوب بغداد في ظل الظروف البيئية السائدة في هذه المنطقة على أدائها التكاثري . شملت هذه الدراسة 128 حيوان تميزت بمدة انعدام الشبق بعد الولادة ما بين 4 إلى 8 أشهر. أخضعت حيوانات الدراسة إلى تجربتين اعتمادا على نوع انعدام الشبق ففي التجربة الأولى وتمثل 73.5% (n=94) كانت تعاني من انعدام الشبق مع وجود الجسم ألاصفر(sub-oestrus) والتجربة الثانية 26.5% (n=34) كانت تعاني من انعدام الشبق الحقيقي (true anestrous). قسمت حيوانات التجربة الأولى,بصورة عشوائية إلى مجموعتين (47 حيوان في كل مجموعة) وفقا لتصميم مجموعة العلاج, وعولجت بنوعين من العلاجات حيث عوملت المجموعة الأولى بهورمون $PGF_{2\alpha}$ فقط ، بينما عوملت المجموعة الثانية بهورمون $PGF_{2\alpha}$ثم حقنت في اليوم التاسع بهورمون GnRH + $PGF_{2\alpha}$. وفي التجربة الثانية والمتضمنة 34 حيوان تم تقسيمها إلى مجموعتين أيضا . المجموعة الأولى شملت 14 حيوان تم معاملتها بالاستراديول أما المجموعة الثانية فقد شملت 20 حيوان تم معاملتها بهرمون بالاستراديول + البروجسترون. تم حساب نسبة الحمل في مجموعتي التجربة الأولى وبلغت 85.1٪ و 89٪ على التوالي وهي ليست ذات فروق معنوية ($P<0.05$) أما في التجربة الثانية فكانت نسبة الحمل71٪ و 75٪ للمجموعتين الأولى والثانية على التوالي. وهي ليست ذات فروق معنوية أيضا. نستنتج من هذه الدراسة إن النسبة السائدة لانعدام الشبق في حيوانات جاموس النهر العراقية المحلية المنتجة للحليب والمستوطنة في هذه المنطقة من العراق هو حالة انعدام الشبق مع وجود الجسم الأصفر(Sub - anoestrus)وان نظام المعالجة بهرمون PGF2α و GnRH هو الأكفأ في علاج هذه الحالات. بينما كانت طريقة المعالجة بهرمون بالاستراديول و البروجسترون ذات كفاءة في معالجة حيوانات الجاموس التي تعاني من حالة انعدام الشبق الحقيقي .

الكلمات المفتاحية : هرمون البروستوكلاندين، هرمون الاستروجين، هرمون GnRH، الجاموس.