Induction of Fertile Estrus in Bitches using Equine Chorionic Gonadotropine (eCG) and Human Chorionic Gonadotropine (hCG)

Talib M. Al-Hamedawi
Department of Surgery and Obstetrics, College of Veterinary Medicine, Baghdad University, Iraq
ali_enas@yahoo.com

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Summary

Eighteen (18) anestrous bitches aged 3-6 years were used in this study. They were diagnosed clinically by external and vaginal examination and the bitches were divided randomly into three equal groups (6 bitches). The 1st group were treated I/M with 20 IU eCG / bitch for 6 days with single injection and 150 IU of hCG hormone /Bitch on day 7 . The 2nd group were treated I/M with 30 IU eCG / bitch for 6 days with single injection and 150 IU of hCG hormone /bitch on day 7, and the 3rd group were treated I/M with 40 IU eCG / bitch for 6 days with single injection and 150 IU of hCG hormone /bitch on day 7. Results showed that the number responded (show proestrus bleeding) were 83.3%, 100% and 83, 3% for the 1st,2nd and 3rd group respectively. The mean duration response from the beginning of treatment to onset of proestrus bleeding were 15.23 ± 2.36, 14.83± 2.43 and 14.16 ±2.58 day respectively .1st and 3rd group recorded significantly P<0.01 higher in response to treatment 1st group recorded significantly higher (P<0.01) compared with 2nd and 3rd group in duration of response. The conception rate was 80% (4/5), 83.3%(5/6) and 60%(3/5) in 1st, 2nd and 3rd group respectively were the 1st and 2nd group recorded higher significant compared with 3rd group. The dystocia parturition was appeared 8.4 % (1/12) from total animals, while the percentage of live newborn (whelps) was 29 (76.3%) and dead 9 (23.7%). In conclusion that the using gonadotrophic hormones (eCG and hCG) have an positive effect of induction the estrus on anestrous bitches.

Keywords: Bitch, eCG, hCG, Estrus, Anestrous Bitches.

Introduction

The reproductive physiology of domestic bitches is unique that they exhibit cyclicity only once or twice a year (1 and 2). The estrous cycle length in the bitch is considerably longer than that the most other domestic species and there is an obligatory anestrous following the termination of luteal phase (2, 3 and 4). A number of methods to induce estrus in dogs have been reported by Cirit (3) and Cancanon (5). Most are probably not appropriate for application in healthy, normally cyclic bitches, despite interest in shorten and synchronizing cycles for the purposes of accommodating owners schedule (5, 6 and 7). The administration of one or more exogenous gonadotrophic hormone preparation to stimulate an ovarian response that results in proestrus followed by fertile estrus with either spontaneous ovulation or ovulation induced by additional hormones (hCG or GnRH) administration (8 and 9). Pregnant mare serum gonadotropin (PMSG) administration at doses of 10 IU/kg for 10 days often causes hyper secretion of estrogen and may cause uterine dysfunction, while improve pregnancy rate 50% occurred when PMSG (20 IU/kg) was administered for only 5 days and immediately followed by a single dose of hCG 50 IU / Bitch (10 and 11), while the authors Onclin (12) and Spatttini (13) demonstrated that the effects of cabergoline (anti-prolactin) on termination anestrous were mediated through prolactin and not directly through corpus luteum thus confirming the indirect mode of action of dopamine agonist on corpus luteum (4 and 14). The aim of this study was to evaluate the effect of eCG and hCG hormones for induction of fertile estrus on anoestrus bitches.

Materials and Methods

This study was conducted in Veterinary Medicine College and two special Veterinary

Clinics in Baghdad. Eighteen healthy anestrous bitches (different breeds) aged 3-6 years were used in duration from 2011-2012 (seasonal anestrous). These bitches were diagnosed by external and vaginal examination and then divided randomly into three groups according to the type of treatment, each group include 6 bitches. The 1st group was treated with eCG (Folligon/Interval – manufactured of European Union). 20 IU/Bitch/I.M for 6 days followed by single injection of hCG (IVF-3/yongje- dong, Iksan-si, Jeonbuk-do, Korea) 150 IU on day 7. The 2nd group administered by eCG 30 IU / Bitch / I.M for 6 days and followed by single injection of hCG 150 IU /Bitch / I.M on day 7 also, while the 3rd group treated by eCG 40 IU / Bitch / I.M for 6 days and followed by the same dose of hCG on day 7. They were subjected to x-ray and abdominal palpation for pregnancy diagnosis between day 30-40 post- breeding and the pregnancy were followed up until whelping and the nature of parturition (normal and dystocia), number and viability of newborn was also recorded. Statistical analysis includes mean, standard error, Chi-Square and Student-test (F-test) for analyzing the data (16).

Results and Discussion

The results of the present study were showed in tables, 1 and 2. Out of the 16 anoestrous bitches treated with eCG and hCG for induction the fertile estrus 88.8% (16/18) responded to the treatment by showing proestrus bleeding. Table,1 represented the response to the hormonal treatment and showed that the response were 83.3% (5.6); 100% (6/6) and 83.3% (5/6) respectively. The duration of response from treatment to proestrus onset was found to be 15.23±2.36, 14.83±2.43 and 14.16±2.58 respectively, were 1st group recorded significantly (P<0.01) higher than that of 2nd and 3rd group. While the number of conceived bitches were recorded 80% (4/5), 83.3% (5/6) and 60 %(3/5) in the 1st, 2nd and 3rd group respectively were the 1st and 2nd group recorded higher significant P<0.01 compared with 3rd group. Table 2 showed that the nature of parturition recorded 91.6% (11/12) for normal and 8.4% (1/12) represented dystosia. The newborn after treatment was 38 whelps. The live whelps were 29 (67.3%) and dead whelps were 9 (23.7%).

The overall Bitches response was 88.8% which showed the proestrus response in the present study ,this results was found to be lower than that of an earlier trial in which 2 could obtain proestrus response of 93.3% in bitches treated with cabergoline while agreement with other workers (5, 10 and 11) which recorded 50% - 70% and their response seems to be due to the role of gonadotrophic hormone to stimulate ovarian response that result proestrus followed by fertile estrus (8 and 9), also the response in 2nd group recorded higher significant (P<0.01) 100% compared with 1st and 2nd groups which recorded 83.3% (table,1), this result could be related to the dosage of eCG. While the duration of response from onset of treatment to proestrus (table,1) was found similar to the observations which have been made by 6, 7 and 10 depend on the dosage of eCG.

The number of conceived animals (pregnancy rate) was recorded 75% in all groups and this result was agreement with 8 and 9 which reported a conception rate was 77% and 82%, while the overall occurrence of dystocia was 8.4% in all groups (table,2). While the normal range 2.5% - 5% recorded by Noakes (7), Vanhaaften (11) and Rota (15), these differences might be due to breed variation. The findings of the present study revealed that the gonadotrophic hormones (eCG and hCG) injected daily for 6 days (eCG) and one dose in day 7 (hCG) could be used for successful induction of a fertile estrous with satisfactory conception rate in anestrous bitches of different breeds.

Table, 1: Type of treatment, degree of response, duration of response and conceived bitches

Group	No. of animal	Type of hormonal treatment	Response animal No. (%)	Duration of response (days) M±SE	Conception rate No. (%)
1	6	eCG 20 IU/bitch 6 days +single dose hCG 150 IU/bitch on day 7	5 (83.3%) a	15.23±2.36 a	4 (80%) a
2	6	eCG 30 IU/bitch 6 days+single dose hCG 150 IU/ bitch on day7	6 (100%) b	14.23±2.43 b	5 (83.3%) a
3	6	eCG 40 IU/bitch 6 day +single dose hCG 150 IU/bitch on day 7	5 (83.3%) a	14.16±2.58 b	3 (60%) b
Total	18		16/18 88.8%		12/16 75%

*** Different litters mean significant P<0.01**

Table, 2: Reveals the effect of treatment on nature of parturition, number and viability of newborns.

Group	No. of animal	Response animal No. %	No. of conceived animal No. %	Nature of parturition N D	No. of newborn	Viability L D
1	6	5 83.3% a	4 80% a	4 -	13	10 3
2	6	6 100% b	5 83.3% a	4 1	16	12 4
3	6	5 83.3% a	3 60% b	3 -	9	7 2
Total	18	16/18 88.8%	12/16 75%	11/12 1/12 91.6% 8.4%	38	29/38 9/38 76.3% 23.7%

N= normal, D=Dystocia, L=Alive, D=Dead.
***different letters means significant differences (P<0.01).**

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احداث الشبق الخصب في الكلاب باستخدام هرمون مصل الفرس الحامل والهرمون المشيمي البشري

طالب موسى عبد الله الحميداوي

فرع الجراحة والتوليد البيطري، كلية الطب البيطري، جامعة بغداد، العراق

الخلاصة

اجريت هذه الدراسة على 18 كلبة عديمة الشبق (سبات جنسي) وقد تم تشخيصها سريريا بواسطة الفحص الخارجي والمهبلي، وقد تم انجاز البحث في كلية الطب البيطري-جامعة بغداد اضافة الى عيادتين بيطريتين في محافظة بغداد وكانت اعمارها تتراوح بين 3-6 سنوات وللفترة بين 2010-2012. تم تقسيم الحيوانات عشوائيا الى 3 مجاميع (ضمت كل مجموعة 6 حيوانات). المجموعة الاولى تم حقنها بهرمون مصل الفرس الحامل. بجرعة مقدارها 20 وحدة دولية/ كلبة في العضل ولفترة 6 ايام اعقبها جرعة واحدة من الهرمون المشيمي الغذائي وبمقدار 150 وحدة دولية/ كلبة في العضلة وذلك في اليوم السابع . اما المجموعة الثانية فقد حقنت بجرعة مقدارها30 وحدة دولية/ كلبة من هرمون مصل الفرس الحامل ولفترة 6 ايام ايضا اعقبها نفس الجرعة من الهرمون المشيمي الغذائي في اليوم السابع ولجرعة واحدة فقط, اما مايخص المجموعة الثالثة فقد تم حقنها ب 40 وحدة دولية/ كلبة من هرمون مصل الفرس الحامل ولفترة 6 ايام اعقبها نفس الجرعة من الهرمون المشيمي الغذائي ولليوم السابع فقط ايضا. وقد اظهرت النتائج ان عدد الحيوانات المستجيبة للعلاج (والتي اظهرت النزف قبل الشبق) هي 83,3% , 100% , 83,3% للمجاميع الاولى والثانية والثالثة على التوالي, فيما كانت الفترة اللازمة للاستجابة من بدء العلاج وحتى ظهور النزف قبل الشبق 15,53±2,36 , 14,83 ±2,43 , 14,16 ±2,58 على التوالي , وقد سجلت المجموعتين الاولى والثالثة فرقا احصائيا وبمستوى P<0.01 مقارنة بالمجموعة الثانية والتي سجلت افضلية على المجموعتين اعلاه فيما يخص نسبة الاستجابة. اما ما يخص فترة الاستجابة فقد سجلت المجموعتين الثانية والثالثة افضلية عما عليه في المجموعة الاولى وبمستوى P<0.01 ايضا. اما معدل الاخصاب فقد سجل نسبة 80% (5/4), 83,3% (6/5) و60% (5/3) للمجاميع الاولى والثانية والثالثة على التوالي وقد سجلت افضلية وبمستوى P<0.01 للمجموعتين الاولى والثانية مقارنة مع المجموعة الثالثة. اما حالات عسر الولادة فقد تم تسجيل نسبة 8,4% (12/1) ولجميع حيوانات المجاميع الثلاثة فيما كانت نسبة المواليد الحية 76,3% (38/29) اما الميتة منها فكانت 23,7 (38/9) . نستنتج من هذه الدراسة انه بالامكان استعمال الهرمونات المحفزة للقند والمتمثلة بهرمون مصل الفرس الحامل والهرمون المشيمي الغذائي له تاثير ايجابي لاحداث الشبق في الكلاب عديمة الشبق (سبات جنسي) وبجرع مختلفة.

الكلمات المفتاحية: اناث الكلاب، هرمون مصل الفرس الحامل ، الهرمون المشيمي البشري ، الشبق ، اناث كلاب غير شبقة.