A COMPARATIVE STUDY OF PROGESTERONE METHOD ADMINISTRATION ROUTES IN IRAQI EWES AND IT'S EFFECT ON REPRODUCTIVE EFFICIENCY

S.M. Tamer **T.M. Al-Hamedawi**
Assistant Instructor **Assisant Professor**
Dept. of Surgery and Obstetrics / college of Veterinary Medicine / University of Baghdad
ali_enas@yahoo.com

ABSTRACT

This study was performed on 50 Iraqi ewes in Abu-Griab village in Baghdad province during the period 2009-2010 and their age from 2-4years and they had at least one parturition before 2-2.5 months, the ewes were divided randomly into 5 equal groups according to the hormonal regime used,1st group injected with 25mg progesterone I.M every 48hrs interval for 4 times followed by 750 IU of eCG injected I.M on day 9. 2nd and 3rd group were treated with intra vaginal sponges impregnated with 40 or 60 mg of medroxy acetate progesterone (MAP) respectively for 9 days. On day 9 the ewes of both groups were injected with 750 IU eCG /I.M after withdrawal of vaginal sponges directly. 4th group were drenched daily with 50 mg progesterone (as pilots) for 8 successive days and on day 9 injected with 750 IU eCG /I.M while 5th group (control group) were injected with normal saline and kept at the same circumstances. After day 9, the ewes of all groups mentioned above were mixed with rams for 7 days to ensure mating. The results revealed that 90% of all groups showed estrus behavior after day 9 with significant variation in the period of response in each group and as follows 5.16±1.26 days , 3.42±1.1 days , 3.57±1.24 days , 5.32±1.81 days and 58.36±9.6 days in the 1st , 2nd , 3rd ,4th and 5th group respectively. While the pregnancy rate was recorded 70% in treated groups. However the percentage of dystocia was 16.67%. the result may indicate that there was no effect of using hormonal treatments on the nature of parturition in spite of getting 28-6-50% twinning rate for the treated groups compared to 12.5% in the control group and there results indicated no effect on the viability of the offspring (90.4% for alive and 9.6 for dead). It was concluded that the using of progesterone in different routes gave a good result in estrus synchronization , pregnancy rate and shortened an estrum period in summer and increase twinning rate when it was administered mixing with eCG.

Key word: ewe, progesterone, eCG.

مقارنة لطرائق اعطاء هرمون البروجستيرون في النعاج العراقية وتأثيرها في الكفاءة التناسلية

صباح معيدي ثامر **طالب موسى عبد الله الحميداوي**
مدرس مساعد **أستاذ مساعد**
فرع الجراحة والتوليد البيطري / كلية الطب البيطري / جامعة بغداد
ali_enas@yahoo.com

المستخلص

اجريت الدراسة في احد الحقول في قرية ابو غريب /محافظة بغداد خلال الفترة من 2009–2010 وضمت الدراسة 50 نعجة عراقية تراوحت اعمارها بين 2–4 سنوات وكانت لها ولادة واحدة ومضى عليها فترة من 2–2,5 شهر ، وقد تم تقسيمها عشوائيا الى خمسة مجاميع ضمت كل مجموعة 10 نعاج وكان التقسيم بموجب البرنامج الهرموني المستخدم ، فقد اعطيت المجموعة الاولى هرمون البروجستيرون حقنا بالعضل باربع جرع (25 ملغم /جرعة) بفارق 48 ساعة بين جرعة واخرى واعقبها في اليوم التاسع اعطاء هرمون مصل الفرس الحامل بجرعة 750 وحدة دولية ، بينما عولجت المجموعة الثانية والثالثة بالاسفنجات المهبلية المشبعة بهرمون المدروكسي استيت بروجستيرون بمقدار 40و60 ملغم للمجموعتين على التوالي اعقبها اعطاء هرمون مصل الفرس الحامل وبجرعة 750 وحدة دولية بالعضلة في اليوم التاسع ولكلا المجموعتين . اما المجموعة الرابعة فقد عوملت من خلال تجريعها فمويا بهرمون ميدروكسي اسيتيت بروجستيرون على شكل حبوب وبمقدار 50 ملغم يوميا ولمدة 8 ايام (400 ملغم/حيوان) واعقبها في اليوم التاسع اعطاء هرمون مصل الفرس الحامل 750 وحدة دولية بالعضلة ، اما المجموعة الخامسة والتي تمثل مجموعة السيطرة فلم تعامل هرمونيا . تم اطلاق الكباش مع النعاج مع نهاية البرنامج الهرموني ولفترة اسبوع وتم التاكد من تسفيدها لاكثر من مرة ومن ثم متابعتها لحين الولادة ، بينما تركت مع مجموعة السيطرة لاكثر من شهرين .اظهرت نتائج الدراسة الحالية ان نسبة ظهور الشبق وصلت الى اكثر من 90% في جميع المجاميع مع مدة استجابة تباينت كثيرا بين المجاميع الاربعة الاولى (المعاملة هرمونيا) مع مجموعة السيطرة وكانت مدة الاستجابة 5.16±1.26 يوم ، 3.42±1.1 يوم ، 3.57±1.24 يوم ، 5.32±1.81 يوم و 58.36±9.6 يوم في المجاميع اعلاه على التوالي . مما تبين فان للبرنامج الهرموني فوائد كبيرة في تقليل مدة السبات الجنسي في النعاج فيما كانت نسبة الحمل قد بلغت 70% وهذا يبين اهمية العلاج الهرموني بالطرائق المختلفة . اما ما يخص طبيعة الولادة فقد تبين بان نسبة حالات عسر الولادة كانت 16.67% وهذا يؤيد فكرة عدم تعارض استخدام البرامج الهرمونية مع طبيعة الولادة ، فيما كانت نسبة التوائم في المجاميع المعاملة هرمونيا ايجابية ووصلت مابين 28.6% الى 50% وهي تمثل فارق كبير مع مجموعة السيطرة والتي لم تتجاوز نسب التوائم فيها 12.5% وهذا يبين اهمية البرامج الهرمونية للنعاج في زيادة نسبة التوائم ، واخيرا فان نسبة المواليد الحية كانت 90.4% مقابل 9.6% للميتة وهذه تدعم استخدام العلاجات الهرمونية والتي لاتؤثر بشكل ملموس على نسبة الحي والميت ، وعليه يمكن الاستنتاج من هذه الدراسة ان اعطاء هرمون البروجستيرون بالطرائق المختلفة ادى الى الحصول على نتائج جيدة فيما يخص المقاييس التناسلية وخصوصا اذا ما استخدم مع هرمون مصل الفرس الحامل والذي يؤدي الى اختزال مدة السبات الجنسي والتي تطول كثيرا في النعاج فيما لو تركت للتناسل الطبيعي.

كلمات مفتاحية: اغنام، هرمون الحمل، هرمون مصل الفرس الحامل.

Introduction

Ewes are one of the most important animals to many farmers in Iraq for its productivity of favorite milk, meat, wool, hide and manure (1, 2), but their animals (ewe) are considered a low reproductive efficiency as it achieve long lambing intervals due to the seasonal reproduction for most of them (3, 4, 5, 6), many authors reported that the most breeds of sheep are sexually inactive during spring and early summer (7, 8). Many studies indicated to important using of hormonal regimes for induction of estrus during the sexual signes inactivity period(during postpartum period) to reduce this period by using progesterone (S/C implant, vaginal sponges, intramuscular injection or powder mixed with concentrated food) with gonadotropine hormones include FSH, PMSG (eCG) and HCG (6, 8, 9, 10 and11).Availability of product ,price, method of delivery and efficacy affect the extent to which progestogens can be used to improve breeding performance in seasonally anestrous ewes(12, 13).This study was performed to evaluate further potential use of different methods of progesterone administration routes with eCG in Iraqi ewes on reproductive efficiency.

Materials and Methods

This study was conducted on 50 Iraqi ewes in a private flock at Abu-Griab village /Baghdad province during the period 2009-2010, their ages range from 2-4 years and the post partum period for all ewes was 2-2.5 months. The fifty ewes were divided into 5 equal groups according to the hormonal regimes used, 1st group include 10 ewes injected with 25mg progesterone (MA Holland: Intervet UK Ltd) /I.M every 24 hrs intervals for 4 times followed by 750 IU of eCG(Folligon/Intervet, Holland) /I.M on day 9, 2nd group (10 ewes) and 3rd group (1ewes) were treated with intra vaginal sponges(Upjohn Ltd/ Fleming way) impregnated with 40 or 60 mg MAP respectively for 9 days, on day 9 the animals of both groups were injected with 750 IU eCG /I.M. 4th group (10 ewes) were drenched daily with 50 mg progesterone (as pilots)(Provera/ Upjohn S.P.A,Spain L.T.D Ascoli, Piceno). For 8 successive days and on day 9 the ewes injected with 750 IU eCG /I.M. 5thgroup which represented the control group (10ewes) were kept at the same circumstances with normal saline treatment, after day 9 the ewes of all groups mentioned above were mixed with 3 rams for 7 days to ensure mating. The number of responsive ewes, duration of response, pregnancy rate and pregnancy period as well as the nature of parturition, type of parturition, viability of lambs and sex of offspring were studied. Statistical analysis include mean, standard deviation, Chi-square and F-test were used and conducted according to (15).

Results and Discussion

The results in table -1- showed that 97.5% of all treatments groups had estrus behavior after day 9 except control group with significant variation in the period of response in each group and as follows :5.16±1.26 days, 3.42±1.1 days, 3.57±1.24 days, 5.32±1.81 days and 58.36±9.6 days in the 1st ,2nd ,3rd ,4th and 5th group respectively, groups 2 and 3 had more effective in the duration of beginning the estrus more than other treatments groups and control and those results were agree with (7,8,9,12) while the percentage of pregnancy recorded significant differences ($P<0.01$) between the 2nd , 3rd and 5th group compared with 1st and 4th group and this reported by (10, 14, 16). The results may indicate in table -2- that there is no side effect of using hormonal treatments on the nature of parturition in spite of getting 28.6% to 50% twinning rate from the treated groups compared with 12.5% in the control group and this results agree with (10, 11 and 13). The viability of the off spring in

treated groups were recorded as 90.4% for a live and 9.6% for dead while the sex of the off spring in all groups were recorded 57.1% which represented male and 42.9% female with significant differences P<0.01 related to male, these results were similar to those by 12 and 4 who showed significant differences in there ratio. This result indicated no side effect of hormonal treatment on the viability of the newborn (8, 11 and 14). Eventually we can concluded that the administration of progesterone to ewes in different routes and especially by intra vaginal sponge gave a good results in estrus induction and synchronization, pregnancy rate particularly when it was used with eCG, shortened estrum period in summer& increase twinning rate

Table1. Estrus and pregnancy rates and their duration in Iraqi ewes treated with different progestin routes

Groups	No. of animals	Type of hormonal treatment	Estrus rate No. %	Estrus duration M ± SD	Pregnancy rate No. %	Pregnancy period (in days) M ±SD
1	10	Progesterone 4doses/25mg each/IM /48hrs interval followed by 750IU/eCG/IM	10 100 a	5.16±1.26 a	7 70 a	146.6±2.7 a
2	10	Vaginal sponges/40mg/ progesterone/ 9days/ followed by 750 IU / eCG / IM	10 100 a	3.42±1.1 b	8 80 b	147.4±2.1 a
3	10	Vaginal sponges/60mg /progesterone/ 9days/ followed by 750 IU / eCG / IM	10 100 a	3.57±1.24 b	8 80 b	145.2±3.2 a
4	10	Progesterone (pilots)/50mg/ 8days/ followed by 750 IU / eCG / IM	9 90 b	5.32±1.81 a	7 70 a	148.4±1.3 a
5	10	control	10 100 a	58.36±9.6 c	8 80 b	146.2±1.2 a
total	50	----------	97.5% in treated ewes	----------	76.9% In treated ewes	146.7±2.1

Similar letters means no significant differences *
Different letters means significant differences (p<0.01) or (p<0.05). **

Table 2 Nature and type of Parturition, lambs viability and sex of off spring of Iraqi ewes treated with different progestin routes.

Groups	No. of ewes	Pregnancy rate No %	Nature of parturition N D % %	Type of parturition S T % %	Viability of lambs A De % %	Sex of lambs M F % %
1	10	7 70	6 1 85.7 14.3	4 3 57.1 42.9	9 1 90 10	6 4 60 40
2	10	8 80	7 1 87.5 12.5	4 a 4 50 50	10 2 83.3 16.7	7 5 58.3 41.7
3	10	8 80	7 1 87.5 12.5	5 a 3 62.5 37.5	10 1 90.9 9.1	7 4 63.6 36.4
4	10	7 70	5 1 71.4 28.6	5 b 2 71.4 28.6	9 0 100 0	4 5 44.4 55.6
5	10	8 80	7a 1b 87.5 12.5	7 c 1 87.5 12.5	8a 1b 88.8 11.2	5a 4b 55.5 44.5
total	50	76.38%	25a 5b 83.33 16.67 *	18a 12b 60 40 *	38a 4b 90.4 9.6 *	24a 18b 57.1 42.9 *

N=Normal, **D**=Dystocia, **S**=Single, **T**=Twins, **A**=Alive, **De**=Dead, **M**=Male, **F**=Female.
Means with different super scripts (a, b, c) within each row differ significantly (P<0.01, P<0.05)
*The results including the treated groups only

References

1-Gordon, I. 1997. Controlled breeding in sheep and goats. Publisher: Oxford University. 23(2): 129-137 .

2- Robert, S. Y. and R. T.Walter. 2007. Large animal inTheriogenology.2nd Ed. Saunders, an imprint of Elsevier ING pp: 654-659, 705.

3- Amir, D.; A. Genixa and H. Schdler. 1980. Seasonal and other changes in the gestation duration of sheep. Journal of Agricultures Science. 95: 47-49.

4- Al-Hamedawi, M. T.; J.D. Kammas and S.A. Al- Ubaidi. 2002. Effect of estrus synchronization on vaginal flora and subsequent fertility in ewes. Iraqi Journal of Veterinary Science. 16(1): 73-79.

5- Arthur, G.H.; D.E. noakes, T.G.Parkinson and G.C. England. 2008. Veterinary Reproduction and Obstetrics. 9th Ed. Printed in China. Pp: 44-45, 69- 70, 316.

6- Kridli, R.T. and S.S. AKhetib.2006. Reproductive responses in ewes treated with eCG or increasing doses of royal Jelly. Animal Reproduction Science.92:75-85.

7- Notter, D.R. and P. Chemineau. 2001Natural melatonin and prolactin plasma concentration in sheep selected for fertility

in autumn lambing. Journal of Animal Science. 79: 2898-2901.

8- Rosa, H.J. and M.J. Bryant. 2003. Seasonality of reproduction in sheep.Small Ruminant Research. 48: 155-171.

9- Riddle, N.G.; D.F. wolfm and D.A. String fellow.1988. Super ovulation of sheep during spring and summer in the south eastern United States. Theriogenology 29: 297-301.

10- Ustuner, B.; U. Gunay, Z. Nur and H. Ustuner.2007. Effect of long and short- term progesterone treatments combined with PMSG on estrus synchronization and fertility in Awassi Ewes during the breeding season. Acta. Vterinary Brno. 76: 391-397.

11- Shahneh, Z.; A. Sadeghi panah; J.H. Barfourooshi and A.M. Emami- mibody. 2008. Effect of eCG administration and flushing on reproductive performance in Nadooshan ewes of Iran. African Journal Biotechnology. 7(18): 3373-3379.

12- Zarkawi, M. 2001. Estrus synchronization and twinning rate of Syrian Awassi ewes treated with progesterone and PMSG during the breeding season. Newzealand Journal of Agriculture Research. 44:159-163.

13- Kridli, R.T.; M.Q. Hussein, H.A. Muhdi and J.M.Al-Khazaleh. 2006. Reproductive performance of hormonally treated anestrus Awassi ewes. Animal Reproduction. 33(3): 347-352.

14- Yates, T.D.; J.L.Yates; R.A.Otis; A.C.Warner; A.R.Halashlh; M.D.Hallfored and T.T.Rose. 2010. Effect of HCG on serum progesterone concentration during the first weeks after mating, components of pre-implantation complete blood counts and number of offspring at parturition in ewes. Sheep and Goat Research Journal. 25: 9-15.

15- Steel, R.G. and J.H.Torrie. 1980. Principles and procedure of statistics. 2nd Ed. McGraw-Hill Book Company. NY.

16- Ataman, B.M.; M.Akoz and O.Akman 2006. Induction of synchronized estrus in Akkaraman cross-breed ewes during breeding and anestrous seasons: The use of short term and long term progesterone treatment. Review Medicine Veterinary. 157(5): 257-260.