

INDUCTION OF PARTURITION IN ALGERIAN HAMRA EWES USING VARIOUS HORMONAL TREATMENTS

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ABSTRACT

One hundred and nineteen Algerian Hamra breed ewes were used in a study of induction of parturition. Ewes were divided randomly into 4 groups, of which 3 groups of 30 ewes each and one control group (29 ewes). On the 144 th day of gestation, as determined by dates of marking by rams, ewes of the first group received 16 mg of Dexamethasone: those of the second group 10 mg of oestradiol benzoate. Fifteen (15) ewes of the third group have received 15 mg of prostaglandin F_{2α} (PGF_{2α}) (Hormo P_{2α}), and the remainder ewes of this group, 250 µg of PGF_{2α} (Cloprostenol). The ewes of the fourth group, without any treatment, have been used as control. One hundred percent of the ewes treated either by Dexamethasone or Oestrogen lambled within 72 hours post-treatment. The PGF (Hormo P_{2α} or Cloprostenol) revealed inefficiencies in the induction of parturition; their mean interval treatment lambing were not different from that of the control group. All treatments used did not present unwanted effects on lambing ewes and their progeny. Difficulties at parturition were only noted more frequent in twin-bearing ewes treated with Dexamethasone. Assistance at lambing has considerably limited the mortality rate of the newborn lambs.

Key words: Parturition, Dexamethasone, Oestrogen, Prostaglandin
F_{2α}, sheep.

INTRODUCTION

The ability of producers to control the time of parturition in domestic animals would be a valuable management tool. Increased utilization of facilities, reduced production costs and reduced prenatal lamb losses are potential benefits of timed parturition. The practice of hormonal induction of parturition in sheep is common in intensive lambing systems in European countries (**Thimonier *et al.*, 1975**).

Parturition is believed to be initiated when adreno-corticotrophic hormone (ACTH) from the fetal pituitary gland causes a release of cortisol from the fetal adrenal cortex (**Barth, 1986 and Arthur, *et al.*, 1992**). The fetal cortisol reduces placental progesterone production and increases placental oestrogen production, resulting in release of prostaglandin F₂ α from the uterus. Consequently, uterine activity increases, the corpus luteum undergoes luteolysis, and parturition is initiated (**Kastelic *et al.*, 1996**). Dexamethasone and other synthetic glucocorticoids mimic fetal cortisol and have been successfully used to induce parturition in ewes (**Adams and Wagnet, 1970; Rommereim and Slyter, 1981 and Menzies and Bailey, 1997**).

Oestrogens have been used to induce parturition (**Boland *et al.*, 1982**) and although PGF₂ α causes luteolysis in the ewe, it is not consistently effective (**Harman and Slyter, 1980 and Boland *et al.*, 1982**). This is apparently due to production of progesterone in the placenta of fetal cotyledons which can maintain pregnancy in the absence of the corpus luteum after 50 days of pregnancy (**Roberts, 1986**).

The objective of this study was to assess the efficacy of exogenous PGF₂ α , Dexamethasone and Oestrogen to induce parturition when administered on day 144 of gestation in the Algerian Hamra breed ewes.

MATERIAL AND METHODS

This study was conducted at the Sebain Itebo Experimental Station, located in the Algerian Highlands, 40 km at the east of Tiaret.

One hundred and nineteen of polyparous Algerian Hamra breed ewes were used in this study during June 1996. They were aged between 3.5 and 4 years and bred using marker rams with dye-painted brisket. Ewes were checked twice a day for the mark, and their date of marking (day 1) was recorded.

On day 144 of pregnancy, ewes were examined clinically and divided randomly, within day of breeding, to four equal groups, the first was left as a control group. Ewes of the second and third groups were intramuscularly injected (i.m) with 16 mg

Dexamethasone (Aziun-Shering plough) and 10 mg of Oestradiol Benzoate (Intervet) respectively. The fourth group was equally divided into two sub-groups, the first was treated with 15 mg PGF₂α, (Hormo P₂α, Sanofi) (i.m) and the other was i.m treated with 250 µg of Cloprostenol (Estrumate, Coopers).

Data recorded were time of lambing, hours from treatment to parturition, total number of lambs born per birth, total weight of lambs born, lambs difficulty score, evidence of retained placenta, mammary gland and milk secretion.

Statistical analysis of discrete variables was performed by a computerized program called " Stagraphics Plus " version 5.2 (1991).

RESULTS

The percentage of ewes lambing within 72 hours post-treatment and their average interval from treatment to lambing is shown in Table (1).

One hundred percent of ewes treated both with Dexamethasone or Oestrogen lambing within 72 hours of treatment compared with 10.34 % for control lambing ewes, 6.66 % for PGF₂ α treated ewes and zero percent (0 %) for Cloprostenol treated ewes.

The mean interval from treatment to lambing for those ewes lambing during the 72 hours period following treatment was 55. 71 ± 6.89 hours for ewes treated with Dexamethasone; 36.48 ± 5.18 hours for ewes treated with Oestrogen; 56.00 ± 27.71 hours for control ewes; 67.71 ± hours for ewes treated with PGF₂ α and no result for ewes treated with Cloprestenol.

Table (1): Percentage of ewes lambing within 72 hrs post-treatment and the average interval from treatment to lambing.

Treatment	Number	Lambing ewes within 72 hours			
		%	Number	Mean hours treatment to parturition	S. E.
Control	29	10.34	3	56	27.71
Dexamethasone	30	100	30	55.71	6.89
Oestrogen	30	100	30	36.48	3.18
PGF ₂ α	15	6.66	1	67.17	—
Cloprostenol	15	00	0	00	—

DISCUSSION

The results for the ewes treated with Dexamethasone in the present study are in agreement with the finding of **Adams and Wagener (1970); Bose (1972) and Kastelic et al., (1996)**, who were able to induce parturition within 72 hours in approximately 90 % of ewes treated with Dexamethasone during the last week of gestation.

Our results indicated that treatment with Oestrogens were more effective in inducing parturition than that of other ewes, and the average interval from treatment from treatment to lambing was the shortest (36.48 ± 3.18 hours).

Results obtained for the ewes treated with $\text{PGF}_2 \alpha$ (Hormo $\text{P}_2 \alpha$ and Cloprostenol) gave worse results comparatively with the others. These results are similar to those obtained by **Boland et al., (1978)** who concluded that the $\text{PGF}_2 \alpha$ had no influence on induction of lambing in ewes. **Moe (1983)** demonstrated that there was no difference between ewes treated with $\text{PGF}_2 \alpha$ and control ewes. In the present study, similar results were obtained.

Concerning lambing difficulty score, it was noted that the number of lambs per birth had influenced this score when ewes were treated with Dexamethasone comparatively with control ewes (8 dystocia). These results are similar to those obtained by **Owens et al., (1985)** and **Peters and Dent (1992)** who concluded that lambing difficulty score increased with the number of lambs per birth.

Oestrogens had no effect on dystocia in ewes in cases of single or twin births. Findings of this study are in agreement with those of **Maltier et al., (1991)** and they differ from those obtained by **Rummer and Rommel (1984)**, perhaps because these authors have induced parturition more precociously.

$\text{PGF}_2 \alpha$ had no efficacy in inducing parturition, and consequently, had no influences on lambing difficulty. **Boland et al., (1978); Moe (1983)** and **Kastelic et al., (1996)** reported similar results.

All treatments had no significant effect on retained placenta, and also, had no influences on mammary development and milk secretion; these results are in agreement with those of **Harman and Slyter (1980); Edey et al., (1982); Harisson (1982); Maltier et al., (1991)** and **Kastelic et al., (1996)**.

Induction of lambing could be a useful management tool to control pregnancy toxemia or synchronize the time of lambing for increasing surveillance and providing assistance. This was the case in this study, because the rate of mortality of lambs was lower than the usual (7.65 %). This procedure of inducing parturition is safe, effective and

inexpensive; however, accurate breeding records are essential as efficacy decreases when treatment is given too early in gestation, and the viability of lambs born more than few days prior to term is likely to be poor.

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REFERENCES

- Adams, W. M. and Wagner, W. C. (1970):* The role of corticoids in parturition. *Biol. Reprod.*, 3: 223-228.
- Arthur, G.H.; Noakes, D. E. and Pearson, H. (1992):* Veterinary Reproduction and Obstetrics. Bailliere Tindall. Chapter 6, P: 132.
- Barth, A. D. (1986):* Induced parturition in cattle. In: *Current Therapy in Theriogenology*. Morrow, D. A. ed. W. B. Saunders, Philadelphia: 209-214.
- Boland, M. P.; Crosby, T. F. and Gordon, I. (1978):* Induction of parturition in sheep. University Collage of Dublin, Faculty of General Agriculture Research. Report 181-76.
- Boland, M. P.; Crosby, T. F. and Gordon, I. (1982):* Induction of lambing : comparison of the effects of Prostaglandin, Oestradiol benzoate and Dexamethasone. *J. Agri. Camb.*, 98: 391-394.
- Bosc, M. J. (1972):* The induction and synchronization of lambing with aid of Dexamethasone. *J. Reprod. Fert.*, 28: 347-357.
- Edey, T. N.; Alston, B. T. and Taylor, P. (1982):* Early induction of parturition and initiation of lactation in sheep. *Theriogenol.*, 18: (3) 255-260.
- Harman, E. L. and Slyter, A. L. (1980):* Induction of parturition in the ewe. *J. Anim. Sci.*, 50: 391-393.
- Harisson, F. A. (1982):* Dexamethasone induced parturition in sheep. *Agricultural Research Council Institute of Animal Physiology.*, 138: 402.
- Kastelic, J. P.; Cook, R.B.; Mc Mahon, L. R. Mc Allister, T. A.; Mc Clellanc, L. A. and Cheng, K. J. (1996):* Induction of parturition in ewes with Dexamethasone or Dexamethasone and Cloprostenol. *Can. Vet. J.*, 37: 101-102.
- Maltier, J. P.; Legrand, C, and Breuiller, M. (1991):* La parturition, in La reproduction chez les mammiferes et l' homme: Thibault, C. and Levasseur, M. C. Inra-ed : 465-483.
- Menzies, P. I. and Bailey, D. (1997):* Lambing Management and Neonatal care. In: *Current Therapy in Large Animal Theriogenology (By Youngquest) Chapter 91, P: 628.* W. B. Saunders Company.
- Moe, L. (1983):* an experiment with PGF₂ α for the indction of parturition in ewe. *Norsh-Veterinarer tidsskrift.* 95: 4. 233-237.
- Owens, J. L.; Bindon, B. M.; Edey, T. N. and Piper, L. R. (1985):* A note of the effect of Dexamethasone induced parturition on ewe behaviour and lamb survival in booroola-merino ewes. *Anim. Prod.*, 41: 417-420.
- Peters, A. R. and Dent, C. N. (1992):* Induction of parturition sheep using Dexamethasone. *Vet. Res.*, 131: 128-129.
- Roberts, S. J. (1986):* Parturition. In: *Veterinary Obstetrics and Genital Diseases*

(Theriogenology). Wood Stock, Vermont: 108: 245-251.

Rommereim, D. N. and Slyter, A. I. (1981): Effect of day gestation on induction of lambing with Flumethasone. *J. Anim. Sci.*, 53: 564-566.

Rummer, J. and Rommel, W. (1984): Induction of parturition in sheep with Dexamethasone. *Tierhygiene-information*, 16: 153-161.

Thimonier, J.; Cognie, Y.; Schneberger, J. and Vernusse, G. (1975): Intensive lamb production. *Annals. Biol. Anim. Biochim. Biophys.*, 15: 365-367.

الملخص العربي

استحداث الولادات لنعاج الحمرا الجزائرية باستخدام علاجات هرمونية مختلفة

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تم استخدام مائة وتسعة عشر نعجة حوامل من سلالة الحمرا الجزائرية خلال هذه الدراسة. قسمت النعاج عشوائيا الي ثلاث مجاميع متساوية (٣٠ نعجة لكل مجموعة) بالإضافة الي مجموعة سيطرة (٢٩ نعجة). وفي اليوم ١٤٤ من فترة الحمل (محسوبة من تاريخ علامات التلقيح الملونة للأكباش) ، تركت نعاج المجموعة الأولى دون أي علاج كمجموعة سيطرة وتم حقن كل من نعاج المجموعة الثانية جرعة مقدارها ١٦ مجم من الديكساميثازون بالعضلة ، وحقنت نعاج المجموعة الثالثة ١٠ مجم من هرمون الأستراديول بنزويت. أما المجموعة الرابعة فقسمت الي مجموعتين فرعيتين (١٥ نعجة لكل مجموعة فرعية) ، حيث حقنت نعاج المجموعة الفرعية الأولى بـ ١٥ مجم من البروستاكلادين ٢ ألفا ، وحقنت البقية بجرعة ٢٥٠ ميكروجرام من البروستاكلادين (Cloprostenol).

استجابت كافة نعاج المجموعتين الثانية والثالثة (١٠٠%) للعلاج حيث تمت الولادات جميعها خلال ثلاثة أيام من تواريخ حقنها. ولم تستجب نعاج المجموعة الرابعة بقسميها للعلاج حيث لم يظهر أي فارق معنوي بينها وبين مجموعة السيطرة (المجموعة الأولى).

لم يلاحظ تأثيرات غير مرغوب فيها علي النعاج المستخدمة في التجربة ولا مواليدها ، سوي بعض الصعوبات خلال عمليات الولادة لدي النعاج التي تحمل توأم من المجموعة الثانية المعالجة بالديكساميثازون. وتأكد أيضا أن المساعدة خلال الولادات حدثت كثيرا من نسب الوفيات لدي المواليد.