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Comparative efficacy of Hormonal methods in oestrus synchronization and multiovulation in sheep

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ABSTRACT

Studies were conducted at three different hormonal methods. 80 mg progesterone impregnated sponge for 14 days plus 1000 IU PMSG injection on sponge removal. 375 mg Progesterone implant subcutaneously for 14 days plus 1000 IU PMSG on day 12 of oestrus cycle and 15 mg PGF_2 alpha on day 14. Synchronization observed was 100, 85.71 and 100 percent respectively. In control group, it was 71.41 percent during entire period of cycle. The average time required for onset of oestrus after last hormonal injection was (46.28±9.5 hours) significantly longer than sponge and implant group. Duration of hormonaly synchronized oestrus in ewes of sponge group was (45.28±4.17 hours) significantly longer than implant group (33.00±2.58 hr) control group (28.2±1.82 hours) and Prostaglandin group (40.00±3.45 hours). The average number of Carpora lutea was highly significant ($P < 0.01$) between the sponge group and control group, implant group and control group, Prostaglandin group and control group. The difference was also highly significant ($P < 0.01$) between Prostaglandin group and sponge group. The average number of Carpora lutea were nonsignificant between sponge group and implant group.

——x——x——x——

Synchronization of ostrus is advantagious for predetermined A.I. for better economic returns and efficient management. Most of the worker have tried progesterone either by intravaginal sponge (Krajinovie *et al.*, 1982, Martemucci *et al.*, 1983) or PMSG at different level to achieve the synchronization effect. Present investigation deals with the administration of pregnant mare serum gonadotropin with Progesterone at different level and prostaglandin F_2 alpha at the end of normal oestrus cycle.

MATERIALS AND METHODS

Twenty eight healthy cyclic mature ewes approximately of same age and body weight were selected for the study from sheep and goat research Centre, PKG Akola. All the experimental animals kept under identical and standard managemental condition. The animals detected in heat by approned ram were selected for study and randomly devided into four group having seven animal in each. Three groups were given different treatments and fourth one was kept as the control (Table 1).

Synchronization of oestrus in ewes was studied Other parameter was time required for onset of oestrus, duration of oestrus. Multiovulatory response were studied by performing laparotomy at mid ventral region of abdomen 2 cm lateral to linia alba and closer to udder under local anasthesia. Multiovulatory response studied by visual inspection and counting the number of C.L. and mature anovulatory follicles. Post operative care of experimental animals were

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taken. Data collected were analysed statistically.

RESULTS AND DISCUSSIONS

Table 2 indicate that all animal comes in heat (100%) in progesteron sponge group and prostaglandin group within 40 to 45 hours of duration. However progesteron implant group showed 85.17% occurance of heat in 33 hours of duration. The percentage of animals exhibited synchronization of oestrus was 100 percent in prostaglandin group within 33 hours, 30 hours and 105 hours respectively, whereas in control group only 71.42 percent ewes exhibited oestrus during entire period of study. Percentage of ewes exhibited synchronized oestrus with three different hormonal treatments were higher than the ewes in control group. It seems that the hormonal treatment effectively inhibited the occurance of oestrus during first fourteen days of treatment and oestrus actively enhanced after the cessation of progesterone treatment and commencement of PMSG treatment in sponge and implant group.

Ainsworth and Downey (1984) Alakass *et al.*, (1989) observed 90 and 91 percent ewes exhibited oestrus in sponge impregnated group. Margiritis, (1975) observed oestrus in 98 percent ewes. However in present investigation it was observed to vary between 100 to 85.71 percent. This variability of response may be due to breed difference and managemental condition or climatic condition. In prostaglandin group 100 percent ewes exhibited oestrus. These results were better than the Ecta (1988) who observed 85.2 percent of ewes in oestrus.

In sponge group time required for onset of oestrus was 26.14 hours. Boshof *et al.*, (1973) also observed similar (25.1 hours) observation in ewes. In implant group the observation were in the line of Eleftherion *et al.*, (1974). However the time required for onset of oestrus was slightly lesser in implant group than in sponge group. Similar observation were also recorded by Yenoutin *et al.*, (1972) and Faure *et al.*, (1979). In the prostaglandin group time required for onset of oestrus were observed to be 40.00±3.45 and Cela (1982) reported the time between 24 to 120 hours. Wani (1985) reported 43.4 hours which supported the observation obtained in the present study.

Analysis of variance did not show significant difference in respect of time required for onset of oestrus after the last hormonal treatment, between sponge and implant group. However, it is singificant ($P < 0.05$) between the sponge group and prostaglandin group and also between the implant group and prostaglandin group. Duration of oestrus in ewes was significantly greater ($P < 0.05$) in the sponge group than in the implant group. It is also significantly higher in implant group and prostaglandin group than control group. However the sponge group is higher significantly ($P < 0.01$) over control group. Oestrus duration seems to be varying depending upon the age of ewes and season involved.

Average number of corpora lutea significantly higher ($P < 0.01$) in all the treatment group over control group (Table 3). However, it is nonsignificant between sponge group and implant group. Carpora lutea in sponge group was rather less than 4.88 CL observed by Boshoff (1973) in

sheep. Shelton (1960) reported lingering effect of progesterone even after the vaginal douch. It is possible that the lesser no. of C L in the present study might be inhibiting effect of lingering traces of progesteron. In prostaglandin group C L observed was 7.57±0.9. Similar observation were also recorded by Mutigu and Baker (1982).

An overall result indicate that the inhibition of oestrus and its release was effective in all the three hormonal methods and each method has its merits and demerits. However the prostaglandin group was better in respect of number of C L on the overy in comparison with the other two methods tried.

Table 1. Experimental design for hormonal oestrus synchronization and multiovulation

Groups	Hormonal Treatment				
No. of ewes	Type of hormone	: Mode of administration	: Duration of treatment	Days of treatment	Amount administartion
I (7)	Progesteron	Sponge	14 days	1st - 14th	80 mg
	PMSG	intramuscular	once	19th	1000 IU
II (7)	Progesteron	Subcut. implant	14 days	1st - 14th	375 mg
	PMSG	Intramuscular	Once	14th	1000 IU
III (7)	PGF_2 alpha	Intramuscular	Once	Days 14 of oestrus cycle.	15 mg
	PMSG	Intramuscular	Once	Days 12 of oestrus cycle.	1000 IU
IV (7)	Control	—	—	—	—

Table 2. Average time length of oestrus.

Group	Time required for onset of oestrus (Hrs)	Duration of oestrus	Animals in oestrus (percent)
I	26.14±1.68	46.28±4.17	100
II	23.00±1.35	33.00±2.58	85.17
III	46.28±9.5	40.00±3.45	100
IV	—	28.20±1.82	71.42

CD = 20.31.

Table 3. Average multiovulation response based on number of corpus luteum (CL) and anovulatory fallicle (AF).

Group	Multiovulation response				Total	
	Left Ovary		Right Overy			
	CL	AF	CL	AF	CL	AF
I	2.14±0.65	1.14±0.47	1.71±0.33	1.14±0.31	3.86±0.47	2.28±0.48
II	2.14±0.42	0.28±0.26	2.43±0.44	0.14±0.13	5.33±0.51	0.43±0.27
III	3.86±0.55	0.71±0.17	3.71±0.39	1.00±0.28	7.57±0.9	1.7±0.33
IV	0.6	0.0	0.4	0.0	1.0	0.0

CD = 2.71, $P < 0.01$ and 1.99 $P < 0.05$

REFERENCES

Ainsworth, L. And B.R. Downey (1984) : A controlled internal drug releasing device containing progesterone for oestrus synchronization in sheep. C.F. Animal Breeding Abstract(1985) 53 *(1):* 224.

Alakass, O.E.; Hamra, A.H. and Hamra, E.F. (1989) : Combined effect of flushing and hormonal treatment on the reproductive performance of Awassi ewe. Indian Journal of Animal Science 59 *(10):* 1249.

Boshoff, D.A.; C.H. Van Niekerk and J.C. Margenthal (1973) : Time of ovulation in the karakul ewe following synchronization of oestrus. C.F. Animal, Breeding Abstract 41*(12):* 5305.

Cela M; Camilla, F.; Romagnoli, S. and Grassi, f. (1988): Oestrus synchronization with PGF^2 alfa and PMSG in massa ewes. L.F. Animal Breeding Abstract (1989) 57*(5):* 3344.

Eleftheriou, E.I.; Margirihs, J. and V. Semadoprular (1974) ; Observation on the influence of progesterone and three levels of PMSG on the ovulation of sheep, through laparatomy during oestrus. C.F. Animal Breeding Abstract(1975) *43(10):* 4590.

Faure, A.S.; Bishoff, D.A. and Burger F.J.L. (1979) : Comparison between introvaginal sponges and subcutanious implants for synchronizing oestrus in karakul ewes. .F. Animal Breeding Abstract(1980), *48(8):* 4682.

Krajinovic, M.; B.Stancic and E.Nao (1982) ; Fertility of ewes treated with PMSG and vaginal sponge containing Progesterone (during breeding season). C.F. Animal breeding Abstract(1985),*53(3):* 1405.

Margaritis, I; Samouelidis, S. and Semadopoulos (1975). : conception rate in sheep following oestrus synchronization by means of 'Sil oestrus' implants, MAP sponges and injection of PMS during anoestrus. C.F. Anim.Breed. Abst.*43 (ii):* 5255.

Martemucci G.; Manchisi, A.; Rifino, F. and R.Celi (1983): Hormonal control of fertility in sheep, Subcutanious hydrogen implants of norgestomet compared with vaginal pessaries containing FGA. C.F. Animal Breeding Abstract.*51(8):* 4987.

Mutiga E.R. and Baker A.A. (1982) ovarian response ova recovery and fertility in merino ewes superovulated either during the luteal phase of their oestrus cycle or after intravaginal progesteron treatment. Theriogenology *17(5):* 537-544

Shelton, M. (1960) : A comparison of ovulation rate at first three heat periods of Angora goats. J. Anim. Sci. *19:* 1227.

Wani, G.M.; Geldermann, H. and J.Hahn (1985) : Oestrus synchronization in goats. C.F. Anim. Freed. Abstr.(1986)*54(4):* 2254.

Xenoulie, P.C.; Minotakis, C.S. and C.T. samis (1972). The evaluation of progesterone implant and MAP impregnated sponges for the advancement of the breeding season in ewes. C.F. Anim. Breed. Abstr.*40 (4):* 4724.