

SERUM PROGESTERONE PROFILE OF CONTROLLED BREEDING PROGRAMME TREATED OSMANABADI GOATS

U.V. Takle*, M.S. Bawaskar, S.K Sahatpure, D.S. Raghuwanshi,
G.R. Bhojne and D.V. Patil

Department of Animal Reproduction Gynaecology and Obstetrics
Nagpur Veterinary College, Nagpur,
Maharashtra Animal and Fishery Sciences University, Nagpur,
Maharashtra, INDIA

E-mail: vilastakle001@gmail.com (*Corresponding Author)

Abstract: The proposed research was conducted at Sheep and Goat unit, Cattle Breeding Farm, Telangkhedi, Nagpur Veterinary College, MAFSU, Nagpur. The research work was carried out with 24 Osmanabadi goats equally divided in to 4 groups during summer season of Vidharbha region from March 2018 to June 2018 to access the efficacy of three different protocols by using Presynch, Ovsynch and intravaginal progesterone sponges. Group IV was served as a control group. Mean (\pm S.E.) serum progesterone levels on day 0th, 10th and 25th from Group I (Presynch) was 1.47 ± 0.11 , 10.43 ± 0.91 and 11.1 ± 1.4 , Group II (Ovsynch) 1.06 ± 0.08 , 10.7 ± 0.91 and 12.09 ± 1.56 , Group III (Intravaginal Progesterone Sponge) 1.42 ± 0.06 , 9.4 ± 0.93 and 11.3 ± 1.59 and from Group IV (Control) were recorded as 2.19 ± 0.3 , 6.63 ± 1.6 and 7.8 ± 1.9 ng/ ml, respectively. The overall mean values of serum progesterone levels on day 0th, 10th and 25th were observed as 1.54 ± 0.48 , 9.31 ± 1.0 and 10.60 ± 1.2 ng/ml respectively. Mean (\pm S.E.) of serum progesterone levels on day 0, 10 and 25th in pregnant goats was 1.09 ± 0.15 , 9.59 ± 1.29 and 11.57 ± 1.55 whereas the mean serum progesterone concentration in non pregnant goats on day 0th, 10th and 25th was 1.71 ± 0.23 , 6.64 ± 0.58 and 6.2 ± 0.65 ng/ ml respectively.

Keywords: Control Breeding Programme, Osmanabadi Goats and Progesterone.

I. INTRODUCTION

Estrus synchronization is a valuable management tool that has been successfully employed in enhancing reproductive efficiency of animals. It is a technique used to bring large number of animals in a flock into overt heat at a pre determined time. Estrus synchronization facilitates scheduled management practices, the culling process, development of marketing strategies and makes better use of management resources in general (Browning and Browning, 2009). By this technique large number of goats can be bred in a short period of time. It reduces the time required for estrus detection helps in conjunction with a procedure for controlling the time of ovulation, to permit insemination on a pre determined schedule.

Hormonal treatment to control ovulation and thus the reproduction is a prerequisite for successful breeding and increasing number of pregnant goats (Husein *et al.* 2005). Induction

and synchronization of estrus has been attempted in goats with PRID, CIDR, ear implant, vaginal sponges, and vaginal coils and even through oral progestin (Dogan *et al.* 2005). One of the important parameter suggesting the reproductive status in goats is the serum progesterone concentration estimated during various physiologic stages. The progesterone level gives an idea regarding the complex endocrinological events during normal and abnormal reproductive functions. Progesterone concentrations are used to monitor the luteal function, estrous cycle and seasonality of reproduction. It also reflects the development and regression of the corpus luteum (Nair, 2015). Therefore present research work was carried out to study the comparative efficacy of three controlled breeding programme on the progesterone profile of the Osmanabadi goats.

II. MATERIAL AND METHODS

Osmanabadi goats of above 1.5 years old were selected for the experimental trial after ruling out the possibilities of early pregnancy by performing two successive ultrasound examinations with the interval of 2 weeks. All the experimental goats were without any genital abnormality irrespective of the ovarian activities. Total 24 Osmanabadi goats were randomly divided in to four groups each comprising of six goats were maintained under uniform routine managemental practices. These 24 animals were dewormed before the start the treatment and goats from three groups were given three different treatment protocols to perform controlled breeding in goats with one control group.

Six goats from group I (Presynch) was treated by modifying standard Ovsynch protocol by using prostaglandin @ 125 µg I/m on 7th day before attempting standard Ovsynch protocol by using injection GnRH @ 4 µg I/m on day 0, injection PGF_{2α} @ 125 µg I/m on 7th and injection GnRH @ 4 µg I/m on 9th.day. The diagrammatic presentation of prostaglandin pre-synchronized Ovsynch protocol used was as follows. Six goats from group II were treated with standard Ovsynch protocol by using injection GnRH @ 4 µg I/m on day 0, injection PGF_{2α} @ 125 µg I/m on day 7th and injection GnRH @ 4 µg I/m on 9th.day. The diagrammatic presentation of progesterone primed Ovsynch protocol used was as follows. Six goats from group III were treated by using intravaginal progestogen sponges were placed intravaginal for 15 days. These intravaginal progestagen sponges were made available from Central Institute for Research on Goats (CIRG,) Makhdoom, Farah, Dist. Mathura (U.P) India. Six goats from group IV was not given any kind of treatment and served as control group. Natural breeding was done in the goats on observed estrous.

Blood samples were collected from jugular vein from all experimental goats in non-heparinized clot activator vials of 5 ml presentation on day 0th, 10th and 25th for the estimation serum progesterone and the blood samples were centrifuged at 3000 rpm for 15 minutes for the immediate separation of serum, which was transferred to properly labeled sterilized 2 ml storage vials at -20°C until the further analysis. Serum progesterone levels were estimated as per the standard protocol by employing standard ELISA technique. The quantitative determination of progesterone concentrations in serum were done by Progesterone Enzyme Linked Immuno sorbent assay (ELISA) kit, manufactured by Xema immunodiagnostics (Russia).

III. RESULT & DISCUSSION

Mean (\pm S.E.) serum progesterone levels on day 0th, 10th and 25th from Group I (Presynch) was 1.47 ± 0.11 , 10.43 ± 0.91 , 11.1 ± 1.4 , Group II (Ovysynch) 1.06 ± 0.08 , 10.7 ± 0.91 , 12.09 ± 1.56 , Group III (Intravaginal Progesterone Sponge) 1.42 ± 0.06 , 9.4 ± 0.93 , 11.3 ± 1.59 and from Group IV (Control) were 2.19 ± 0.3 , 6.63 ± 1.6 and 7.8 ± 1.9 ng/ml, respectively (Table 1). The overall mean values of serum progesterone levels on days 0th, 10th and 25th were observed as 1.54 ± 0.48 , 9.31 ± 1.0 and 10.60 ± 1.2 ng/ml respectively which differed significantly at 5% level of significance. On day 0th and 10th the mean serum progesterone levels were found significantly increased.

On the 0th day of the protocol, the serum progesterone levels was 2.19 ± 0.3 which increased to 6.63 ± 1.6 ng/ml which indicates that, the progesterone impregnated intra-vaginal sponges were releasing progesterone exogenously leading to higher serum progesterone concentrations on day 10th due to better absorption during this period in this group. These findings are similar with Amle (2011), Goel and Kharche (2012) and Ibrahim (2013). On the 7th day of the protocol, the serum progesterone levels were increased to 6.63 ± 1.6 ng/ml which indicates that, the progesterone impregnated intra-vaginal sponges were releasing progesterone exogenously leading to higher serum progesterone concentrations on day 7 due to better absorption during this period in both the groups. These findings are also in accordance with the Amle (2011) and Ibrahim (2013).

Present findings are in accordance with the Alwan *et al.* (2010) who monitored the plasma progesterone concentration in ewes and does during estrous and gestation and during the estrous cycle, pregnancy plasma progesterone concentration was found to be 9.3ng/ml, which varied between 2 and 18 ng/ml in small ruminant. In contrary with the present findings Rosnina *et al.* (2012) in a study calculated the plasma progesterone concentrations in

synchronized estrus cycle, their subsequent estrus cycles, and in unsynchronized in naturally cycling Boer x Feral crossbred goats and observed that the plasma progesterone concentration between the PGF2alpha synchronized as 3.51 ± 0.19 ng/ml and their subsequent estrus cycle as 3.22 ± 0.71 ng/ml as well as between CIDR synchronized 5.98 ± 1.11 ng/ml and subsequent estrus cycle as 4.25 ± 1.37 ng/ml and these values were not significantly different ($P > 0.05$) but were higher than in the unsynchronized goats recorded as 2.99 ± 1.64 ng/ml.

The mean (\pm S.E.) of serum progesterone levels on day 0th, 10th and 25th in pregnant goat were 1.094 ± 0.15 , 9.59 ± 1.29 and 11.57 ± 1.55 whereas the mean serum progesterone concentration in non pregnant goats on day 0th, 10th and 25th were 1.71 ± 0.23 , 6.64 ± 0.58 and 6.2 ± 0.65 respectively. The mean serum progesterone levels in pregnant and non pregnant goats varied significantly. It was observed that mean serum progesterone values on day 25th varied significantly in pregnant and non pregnant goats. It was also observed that, there was a significant variation ($P < 0.05$) in mean serum progesterone concentrations of the pregnant and non pregnant goats on day 10th and 25th day (Table 1).

The conceived animals showed relatively lower progesterone level as compared to those that failed to conceive on day 0 (oestrus). There have been not observed any exact similar comparable reports regarding the co-relation between the progesterone level on day 0 (oestrus) with the conception rate following synchronization protocols in goats. From the present study, it could be suggested that the animals with lower level of progesterone on the day of estrus (day 0) have greater probability for conception. The pregnant animals in the present study exhibited higher progesterone levels by day 10 and 25 than the non pregnant animals because the later returned to estrus from day 16 to 21 as reported by Zarkawi and Soukouti (2001) and Medan *et al.* (2004).

Table: Mean (\pm S.E.) of serum Progesterone levels (ng/ml) on 0th, 10th & 25th day

| Group No | 0 th Day | 10 th Day | 25 th Day |
|---------------------|---------------------|----------------------|----------------------|
| Group-I | 1.47 ± 0.11^a | 10.43 ± 0.91^b | 11.1 ± 1.4^b |
| Group- II | 1.06 ± 0.08^a | 10.7 ± 0.91^b | 12.09 ± 1.56^b |
| Group-III | 1.42 ± 0.06^a | 9.4 ± 0.93^b | 11.3 ± 1.59^b |
| Group-IV | 2.19 ± 0.3^a | 6.63 ± 1.6^b | 7.8 ± 1.9^b |
| Pregnant (n=11) | 1.09 ± 0.15^a | 9.59 ± 1.29^b | 11.57 ± 1.55^b |
| Non pregnant (n=13) | 1.71 ± 0.23^a | 6.64 ± 0.589^a | 6.24 ± 0.65^a |
| Overall | 1.54 ± 0.48^b | 9.31 ± 1.0^a | 10.60 ± 1.2^a |

a, b, Means with different superscript vary significantly at $P < 0.05$

CONCLUSION

Serum progesterone concentrations significantly increased from day 0 to 25th and the conceived goats gave moderately low progesterone level as compared to those failed to conceive on day 0 (estrus).

REFERENCES

- [1] Alwan, A.F., F.A.M Amin and N.S Ibrahim (2010) Blood progesterone and estrogen hormones level during pregnancy and after birth in Iraqi sheep and goat, *Bangladesh Journal of Animal Science*. 10: 2.
- [2] Amle, B.M. (2011) Controlled breeding in Osmanabadi and Sangamneri goats by using different hormonal protocols. Thesis submitted to Department of Animal Reproduction Gynaecology and Obstetrics, Bombay Veterinary College, M.A.F.S.U., Nagpur.
- [3] Browning, M.L.L. and R. Browning (2009) controlled breeding season management for meat goats. Department of Agricultural sciences, Tennessee State University, Alabama p-117.
- [4] Dogan, Z. Nur, U. Gunay, H. Sagirkaya, M.K. Soylu, C. Sonmez (2005) Estrous synchronization during the natural breeding season in Anatolian black does, *Vet. Med.-Czech*, 50, 2005 (1): 33–3.
- [5] Goel, A.K., S.D. Kharche S.K. Jindal and N.K. Sinha (2012) Estrus Synchronization efficacy of PGF₂ α in cyclic goat. In : *Proceeding of IAAVR & Indian Veterinary Congress IV Vetex*, April 14-15, Abstract No. 03-46.
- [6] Husein, T., Y. Hamit (2005) Synchronization of estrous in Hamdani ewes: the use of different PMSG doses. *Bull. Vet. Inst. Pulawy*. 49, 311-314.
- [7] Ibrahim, N.S., (2013) Serum FSH, LH and Progesterone Hormones Concentrations in Relation to Hormonal Estrous Induced, Laparoscopical Insemination and Pregnancy in non-Breeding Season in Iraqi Goats. *Online International Interdisciplinary Research Journal*, ISSN2249-9598, Volume-III, Issue-VI: 54-59.
- [8] Medan *et al.* (2004) Medan, M.S. and A.M.A. El-Aty (2004) Advances in ultrasonography and its application in domestic ruminants and other farm animals reproduction. *J. Adv. Res* 1: 123-128.
- [9] Nair (2015) Optimization of progesterone primed oestrus synchronization protocols in goats, M.V.Sc. thesis submitted to BVC, MAFSU, Nagpur.
- [10] Rosnina, Y., Bukar, M.M, Ariff, M., Wahidl, H., Mohd Azam Khan, G. K., Yimerl, N. and. Dhaliwal, G. K (2012) Corpora Lutea Diameter, Plasma Progesterone Concentration and

Follicular Development in PGF_{2c}, and CIDR Estrus Synchronized Goats, Pak Vet J, 2012, 32(2): 216-220.

[11] Titi, H.H., Kridli, R.T. and Alnimer, M.A. (2008) Oestrus synchronization in sheep and goats using combinations of GnRH, Progestagen and ProstaglandinF_{2α}. *Reprod. Dom. Anim.* doi 10:1439.

[12] Zarkawi, M. and Soukouti, A. (2001) Serum progesterone levels using radioimmunoassay during oestrous cycle of indigenous Damascus does. *New Zealand J. of Agri. Res.* 44: 2, 165-169.