

LUTEAL DEFICIENCY: AN IMPORTANT CAUSE OF CONCEPTION FAILURE IN SAHIWAL CATTLE

V.B.S. AYAM¹, M.K. AWASTHI², J.R. KHAN³ AND M.R. POYAM⁴

*Department of Veterinary Gyneacology and Obstetrics
College of Veterinary Science and Animal Husbandry, Anjora, Durg - 491 001*

Received: 09.05.2016

Accepted: 16.07.2016

ABSTRACT

Plasma progesterone was determined during mid-luteal phase to evaluate the impact on subsequent conception in Sahiwal cattle (n=40) that were subjected to artificial insemination (AI) with good quality frozen semen about 12 h after the onset of estrus. Blood plasma was collected on day 10 post-AI and progesterone was determined through ELISA. Pregnancy diagnosis between days 50-60 post-AI divided the animals into conceived and non-conceived group (n=20 each). In both groups, plasma progesterone was similar (6.38 ± 0.63 vs. 4.61 ± 0.76 ng/ml, $p > 0.05$). However, in non-conceived group, five animals had plasma progesterone < 1.0 ng/ml and all the animals with plasma progesterone > 5.0 ng/ml on day 10 post-AI conceived. Thus, an adequate progesterone release during early stages of conception may have a role in subsequent pregnancy maintenance.

Keywords: Luteal deficiency, Mid-luteal phase, Pregnancy, Progesterone, Sahiwal cattle

Improper corpus luteum (CL) functioning associated with poor release of progesterone during luteal phase is termed as luteal deficiency, an important cause of early embryonic mortality and conception failure in dairy cattle (Noakes *et al.*, 2001). Thus, the present investigation in an indigenous Sahiwal cattle breed was conducted to estimate the plasma progesterone profile on day 10 post-insemination to elucidate its impact on conception rate.

Forty healthy suckled postpartum Sahiwal cattle with normal reproductive tract and voluntary waiting period of 60 days were selected for the present study following the detection of standing estrus through vasectomized bull. Animals were inseminated with good quality frozen semen 12 h after the onset of estrus. The blood samples were collected from each animal on day 10 post-insemination (AI) and plasma was separated and stored at -20°C till analysis. Following pregnancy diagnosis between days 50-60 post-insemination, the cattle were divided into conceived (n=20) and non-conceived (n=20) group.

Plasma progesterone was determined through ELISA using a commercial diagnostic kit. Independent 't' test was applied to determine the differences between groups using SPSS computer programme version 10.0.

The retrospective analysis of data suggested that on day 10 post-AI, plasma progesterone was similar ($p > 0.05$) between conceived (6.38 ± 0.63 ng/ml) and their non-conceived counterparts (4.61 ± 0.76 ng/ml). Nevertheless, five cattle that failed to conceive had < 1.0 ng/ml plasma progesterone on day 10 post-AI, thus, suggesting the presence of luteal insufficiency in these animals, although the failure of fertilization cannot be ruled out in these cases. In fact, the endogenous insufficiency of progesterone is one of the reasons for low conception rate in dairy cattle (Noakes *et al.*, 2001).

The divergence in plasma progesterone occurs between day 6 and 10 post-estrus in dairy cattle that conceived in comparison to their counterparts failing to conceive (Rosenberg *et al.*, 1990). In the present study, Sahiwal cattle with plasma progesterone > 5.0 ng/ml on day 10 post-AI conceived, whereas the

¹Postgraduate Student, ²Professor, ⁴Assistant Professor; ³Professor, Department of Physiology and Biochemistry; *awasthik1963@rediffmail.com

cattle with plasma progesterone <5.0 ng/ml failed to conceive. Similar observation has been reported earlier and suggested the role of progesterone to sustain pregnancy (Rosenberg *et al.*, 1990). In conclusion, adequate release of plasma progesterone is essential to sustain growth and maintenance of embryo during early stages of pregnancy in Sahiwal cattle

Rosenberg, M., Kaim, M., Herz, Z. and Folman, Y. (1990). Comparison of methods for the synchronization of estrous cycle in dairy cows: Effects on plasma Progesterone and manifestation of estrus. *J. Dairy Sci.*, **73**: 2807-2816.

REFERENCES

Noakes, D.E., Parkinson, T.J. and England G.C.W. (2001). *Arthur's Veterinary Reproduction and Obstetrics*. 8th edition, Harcourt (India) Pvt. Ltd., New Delhi, pp. 451-464.