

Short Communication

Correlation of certain Haematological Parameters of Physiological Significance with Reproductive Pattern in Sahiwal Cows

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ARTICLE HISTORY

Received: 2013-03-31
Revised: 2013-04-26
Accepted: 2013-04-27

Key Words: Haematological parameters, Heatsynch protocol, Estrus, Sahiwal

ABSTRACT

Blood profile changes during various reproductive states, it is imperative to study hematological constituents during these states. The present project was therefore designed to investigate various haematological values of Sahiwal cows during synchronization programme by using Heatsynch protocol. 5 ml blood with anticoagulant was collected from six cows aseptically by jugular vein puncture on day 0,7,10 & 20. Among haematological parameters TLC (thousands/ μ l), TEC (millions / μ l), Hb (g %), HCT (%), MCV (fl), MCH (pg) and MCHC (g/dl) were evaluated by using an automatic blood analyzer. The study indicated significant decrease in the TEC, Hb and HCT at the time of induced estrus from the day before start of treatment. The mean platelet counts vary non- significantly during the experiment. The mean values of erythrocytic indices (MCV & MCHC) highly significant ($p < 0.01$) at day of induced estrus. Hematological parameters can be an important tool for the assessment of reproductive behavior in Sahiwal cows.

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ARTICLE CITATION: Caesar DD, Shakkarpude J, Singh HS, Mishra A, Caesar NK (2013). Correlation of certain hematological parameters of physiological significance with reproductive pattern in Sahiwal cows. *Res. j. vet. pract.* 1 (1): 10-11.

Blood is crucial for the maintenance of physiological equilibrium in the body (Geneser, 1986). However, this equilibrium may be disturbed due to certain physiological and pathological conditions. Estrus, Pregnancy and lactation are physiological statuses considered to modify metabolism in animals (Krajnicakova *et al.* 2003). It is well known that variables such as breed, stage of growth, age, reproduction status and stage of lactation have an influence on many blood parameters (Doornenbal *et al.* 1988)

The knowledge of haematological values is useful in diagnosing various pathological and metabolic disorders, which can adversely affect the productive and reproductive performance of cows. Since blood profile changes during various reproductive states and are important indicators of the physiological or pathological state of the animal. Hence, it is essential to study haematological constituents during these states. The study was aimed at examining haematological parameters of physiological significance with reproductive pattern in Sahiwal cows during Heatsynch Protocol.

A total of six Sahiwal cows were selected from the Livestock Farm, Adhartal for the experiment after per rectal examination. 5 ml blood with anticoagulant was collected from each animal aseptically by jugular vein puncture on day 0,7,10 & 20. Among haematological parameters, TLC (thousands/ μ l), TEC (millions / μ l), Hb (g%), HCT (%), MCV (fl), MCH (pg) and MCHC (g/dl) were evaluated by using an automatic blood analyzer. The data of the study was analyzed by using Completely Randomized Design (CRD) as per the method described by Snedecor and Cochran (1994).

The study indicated significant decrease in the TEC, Hb and HCT at the time of induced estrus from the day before start of

treatment. TEC was decreased during estrus than day before start of treatment. The most important physiological alteration in blood picture of cattle in estrus were luteolysis, decrease in TEC, Hb and HCT on the day of induced estrus (day 10). These changes could be attributed to the direct action of the increased production of estrogen at this stage or indirectly from the anterior pituitary activity (Wolf, 1949). Another explanation for such haematological deviation might be the increased adrenocortical activity. As some amount of estrogen is being synthesized and secreted by the adrenal glands. Soliman and Selim (1966) studied the blood picture of various reproductive phases and concluded that the erythrocyte number and haematological content dropped at estrus, while the total number of white cells increased at this stage. The mean platelet counts vary non- significantly during the experiment, which is not in agreement with Mahajan *et al.* (2008). It is generally agreed that androgen stimulates the erythropoiesis and estrogen produce anemia by inhibiting erythropoiesis. Mirand and Gordan (1966) described that estrogen inhibits erythropoiesis by suppressing the production of an external precursor of erythropoiesis.

The mean values of erythrocytic indices (MCV & MCHC) vary significantly within group at the day of induced estrus. The MCH and MCHC values are affected by variation in Hb synthesis (Benjamin, 1978). Since, MCHC is a measure of the quantity of Hb in each RBC and also relates to weight of Hb and volume of cell, the cows having lower Hb concentration showed lower MCH and MCHC values (Ahmadi *et al.*, 2002). Based on the results of the present study, it can be concluded that Hematological parameters can be an important tool for the assessment of reproductive behavior in Sahiwal cows

Parameters	Day 0	Day 7	Day 10	Day 20
	Mean±SE	Mean±SE	Mean±SE	Mean±SE
WBC($10^3/\mu\text{l}$)	28.65±2.51	31.71±2.02	26.16±2.31	29.41±2.34
TEC($10^6/\mu\text{l}$)	6.17 ^{ab} ±0.16	6.41 ^a ±0.30	5.41 ^c ±0.22	5.87 ^b ±0.19
Hb (g%)	12.16 ^a ±0.28	12.38 ^a ±0.38	10.91 ^b ±0.43	11.86 ^a ±0.44
HCT (%)	37.08 ^a ±1.69	37.76 ^a ±1.91	32.08 ^c ±1.59	34.41 ^b ±1.56
MCV (fl)	60.33 ^a ±2.07	60.30 ^a ±1.97	59.41 ^b ±1.76	58.60 ^c ±1.68
MCH (pg)	20.39±0.54	19.73±0.19	20.00±0.24	20.25±0.18
MCHC(g/dl)	33.64 ^b ±0.77	32.96 ^b ±0.98	33.81 ^b ±0.82	34.81 ^a ±1.11
PLT ($10^3/\mu\text{l}$)	267.5±42.92	279.16±50.36	249.00±54.17	300.83±69.83

Mean values with different superscripts in a row vary significantly ($p < 0.05$)

Table: Mean concentration of haematological parameters in Heatsynch protocol

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