



INTER-RELATIONSHIP OF HAEMATOLOGICAL PARAMETERS WITH REPRODUCTIVE PATTERN DURING DOUBLE PGF₂A PROTOCOL IN CROSSBRED COWS

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ABSTRACT

Blood is of crucial importance for the maintenance of physiological equilibrium in the body. However, this equilibrium may be disturbed due to certain physiological and pathological conditions. Blood act as a pathological reflector of the status of exposed animals to toxicant and other conditions like estrus. Since blood profile changes during various reproductive states, it is imperative to study haematological constituents during these states. The present project was therefore designed to investigate various haematological values of crossbred cows during Double PGF₂ protocol. Blood samples (5 ml with 10 % aqueous solution of Ethylene Diamine Tetra Acetic acid (EDTA) as anticoagulant) were collected from each animal aseptically by jugular vein puncture by using sterilized needle for haematological parameters on day 0, 11, 12, 13 & 14. Among haematological parameters TLC (thousands/ μ l), TEC (millions / μ l), Hb (g %), PCV (%), MCV (fl), MCH (pg) and MCHC (g/dl) were evaluated by using an automatic blood analyser. The study indicated significant decrease in the TEC, Hb and PCV at the time of induced estrus from the day before start of treatment. The mean platelet counts vary non- significantly within group in Double PGF₂ protocol. MCV was increased whereas; MCH and MCHC were decreased at day of induced estrus from the day before start of treatment. Hematological parameters can be an important tool for the assessment of reproductive behavior in crossbred cows.

KEYWORDS: haematological parameters, estrus, PGF₂ , crossbred.

INTRODUCTION

Blood is of crucial importance for the maintenance of physiological equilibrium in the body (Geneser, 1986). However, this equilibrium may be disturbed due to certain physiological and pathological conditions. 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, resulting in great economic losses to dairy farmers (Pyne & Maira, 1981; Dutta *et al.*, 1988). Since blood profile changes during various reproductive states, it is imperative to study haematological constituents during these states. These changes in haematological constituents are important indicators of the physiological or pathological state of the animal. The present project was therefore designed to investigate various haematological values of crossbred cows during Double PGF₂ .

MATERIALS & METHODS

The proposed investigation was conducted at Livestock Farm, Adhartal, Jabalpur (M.P.) and Department of

Veterinary Physiology & Biochemistry, College of Veterinary Science & A.H., MPPCVV, Jabalpur (M.P.).

A total of 12 Crossbred cows were selected from the Livestock Farm, Adhartal for the experiment after per rectal examination. Blood samples (5 ml with 10 % aqueous solution of Ethylene Diamine Tetra Acetic acid (EDTA) as anticoagulant) were collected from each animal aseptically by jugular vein puncture by using sterilized needle for haematological parameters on day 0, 11, 12, 13 & 14 (Double PGF₂ protocol). Among haematological parameters TLC (thousands/ μ l), TEC (millions / μ l), Hb (g%), PCV (%), MCV (fl), MCH (pg) and MCHC (g/dl) were evaluated by using an automatic blood analyser.

RESULT & DISCUSSION

The mean values of different haematological attributes in Double PGF₂ are presented in Table 1.

The study indicated significant decrease in the TEC, Hb and PCV at the time of induced estrus from the day before start of treatment in double PGF₂ protocols. The present results of haematological parameters during estrus are in agreement

with the findings of other authors (Soliman and Selin, 1966; Sharma *et al.*, 1968; Singh and Singh, 2006). These changes could be attributed to the direct action of the increased production of estrogen during this period or may have been increased indirectly the active secretions from the anterior pituitary. The other possible reason for such haematological deviation might be the increased adrenocortical activity. The mean platelet counts vary non-significantly within group in double PGF₂ protocols 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. In double PGF₂ protocol the mean values of MCV was increased whereas, MCH and MCHC were decreased at day of induced estrus from the day before start of treatment. The MCH and MCHC values are affected by variation in Hb synthesis (Benjamin, 1978). Ahmad *et al.* (2003) suggested that the 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.

TABLE 1: Mean concentration of haematological parameters in Double PGF₂ protocol

Parameters	Mean±SE				
	Day 0	Day 11	Day 12	Day 13	Day 14
WBC(10 ³ /µl)	23.32±3.12	23.24±3.13	21.97±2.79	19.83±2.55	22.37±3.05
RBC(10 ⁶ /µl)	5.42 ^a ±0.39	5.61 ^a ±0.48	5.63 ^a ±0.42	5.66 ^a ±0.44	4.99 ^b ±0.19
Hb (g%)	10.68 ^a ±0.92	10.78 ^a ±0.94	10.80 ^a ±0.96	10.97 ^a ±0.87	9.54 ^b ±0.53
PCV (%)	34.90 ^{ab} ±3.54	35.08 ^a ±3.53	36.47 ^a ±3.71	36.36 ^a ±3.07	32.33 ^b ±2.23
MCV (fl)	63.87 ^{bc} ±2.61	63.81 ^c ±2.48	64.30 ^{ab} ±2.62	64.68 ^a ±2.50	64.21 ^{bc} ±2.59
MCH (pg)	19.57±0.33	19.36±0.32	19.03±0.40	19.69±0.15	19.16±0.42
MCHC(g/dl)	30.88 ^{ab} ±0.86	31.10 ^a ±0.92	29.85 ^c ±0.69	30.56 ^{abc} ±1.07	30.02 ^{bc} ±0.64
PLT (10 ³ /µl)	296±36.77	303.83±28.88	364.16±35.30	302±17.28	356.66±33.99

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

CONCLUSION

Based on the results of the present study, it can be concluded that Hematological parameters can be an important tool for the assesment of reproductive behavior in crossbred cows.

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