INTER-RELATIONSHIP OF HAEMATOLOGICAL PARAMETERS WITH REPRODUCTIVE PATTERN DURING DOUBLE PGF₂α 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 PGF₂α protocol. Blood samples (5 ml with 10 % aqueous solution of Ethylene Diamine Tetra Acetic acid (EDTA) as anticoaugulant) 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/ µl), TEC (millions /µl), 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 PGF₂α 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, PGF₂α, 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 PGF₂α.

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 anticoaugulant) 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 PGF₂α protocol). Among haematological parameters TLC (thousands/ µl), TEC (millions /µl), 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 PGF₂α 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.

RESULT & DISCUSSION
The mean values of different haematological attributes in Double PGF₂α 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 PGF₂α 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 PGF$_2$α 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 Gordon (1966) described that estrogen inhibits erythropoiesis by suppressing the production of an external precursor of erythropoiesis. In double PGF$_2$α 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 PGF$_2$α protocol

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

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 assessment of reproductive behavior in crossbred cows.

### REFERENCES


Benjamin, M.M. (1978) Outline of Veterinary Clinical Pathology. 3rd Ed.The Iowa State, University Press, Ames, Iowa, USA.


