Comparison of Haematology in Various Physiological States in Sahiwal Cattle

ABSTRACT

Twenty seven Sahiwal cows were used in the experimentation and were divided into 3 groups (n=9). Animals were divided into three groups as Pregnant dry cows, Non Pregnant Lactating cows and Non Pregnant Dry cows. The highest Hb concentration (10.42 ± 0.42 gm/dl) was recorded in group-1, while the lowest (9.26 ± 0.34 gm/dl) was observed in group-2. The highest and lowest RBCs count and PCV (5.83 ± 0.39 x 106/µl, 32.67 ± 1.36% and 4.57 ± 0.27 x 106/µl and 29.26 ± 1.11%) were recorded in group-3 and group-1 respectively. The highest MCV, MCH and MCHC (65.10 ± 2.27fl, 35.58 ± 1.04 gm/dl) were noted in group-1 and the lowest (57.87 ± 2.15 fl, 18.59 ± 1.43pg and 31.76 ± 1.22 gm/dl) were noted in group-3. The highest and lowest ESR (7.58± 0.67 mm/24 hours and 5.12 ± 0.67 mm/24 hours) were recorded in group-1 and group-2 respectively. The highest and lowest WBCs count (8.72 ± 1.32 x 103/µl and 29.26 ± 1.11%) were recorded in group-2 and group-1 respectively. Highest lymphocyte count (65.24 ± 3.00 %) was observed in group-2, while lowest count (64.29 ± 2.91%) was in group-1.

INTRODUCTION

Physiological equilibrium is maintained mainly by the blood in the body (Geneser, 1986) but this equilibrium is altered in various physiological conditions changing the homeostasis of animals. Hence, the haematological values during different physiological situations should be known for the diagnosis of various pathological and metabolic disorders, which can adversely affect the productive and reproductive performance of cows, leading to heavy economic losses (Dutta et al., 1988).

MATERIALS AND METHODS

Twenty seven Sahiwal cows of different age groups were used in the experimentation. These animals were maintained and housed under similar conditions of feeding and management. The animals were fed daily 40-50 Kg of green fodder and 2-3 Kg of concentrate mixture; containing 15% crude protein and 65% total digestible nutrients. These animals were divided into 3 groups, having 9 animals in each group. The grouping was done depending upon their physiological conditions as follows: group1- Pregnant dry cows, group 2- Non Pregnant Lactating cows and group 3-Non Pregnant Dry cows.

Fifteen ml of venous blood from the Jugular vein of each animal was collected, using one mg of disodium salt of ethylenediaminetetraacetic acid per ml of blood as an anticoagulant (Sastrı, 1985). Haematological parameters were studied according to the methods described by (Sastrı, 1985). Haematological values during different physiological states of Sahiwal cattle are given in Table 1. The highest Hb concentration was recorded in Pregnant dry cows (Group-1), while the lowest values were observed in non-pregnant lactating cows (Group-2), the difference was statistically significant (P<0.05). Similarly, the highest RBCs count and PCV were recorded in Non Pregnant Dry cows (Group-3), while the lowest values were observed in pregnant dry cows (Group-1), the difference being statistically significant (P<0.05). In the current study, the highest MCV, MCH and MCHC were noted in Pregnant dry cows (Group-1) and the lowest values were observed in Non Pregnant Dry cows (Group-3), the differences were statistically significant (P<0.05). In the present study, the highest ESR was recorded in pregnant dry cows (Group-1) and the lowest values were observed in Non Pregnant Lactating cows (Group-2), the difference was statistically significant (P<0.05). The highest WBCs count was recorded in Non Pregnant Dry cows (Group-3) and the lowest values were observed in Non Pregnant Lactating cows (Group-2), the difference was significant (P<0.05). Significantly (P<0.05) higher lymphocyte count was observed in Non Pregnant Lactating cows (Group-2) compared to Pregnant dry cows (Group-1).

DISCUSSION

Ahmad (1995) reported PCV 28.4 ± 0.61 to 31.4 ± 0.50%, Hb 9.7 ± 0.30 to 11.1 ± 0.30 gm/dl and RBC count 4.7 ± 0.41 to 7.0 ± 0.42×106/µl in Sahiwal cows during last trimester of pregnancy (pregnant dry cows). These values are closely related to the values of the present study. Unlike our study, Steinhardt et al. (1994) reported decrease in Hb with advancing lactation and pregnancy, which increased at parturient stage. Kumar and Pachauri (2000) reported highest MCV and MCH, and lowest MCHC in non-pregnant dry cows compared to other groups which are closely related to our study. Ahmad (1995) reported WBC count of 6.8 ± 0.28 to 8.3 ±
Table 1: Haematological parameters (mean ± SE) in sahiwal cattle at different physiological stages

| Parameter                              | Pregnant dry cows | Non Pregnant Lactating cows | Non Pregnant dry cows |
|----------------------------------------|-------------------|-----------------------------|-----------------------|
| Haemoglobin conc (gm/dl)               | 10.42 ± 0.42ab    | 9.26 ± 0.34a                | 10.31 ± 0.41bc       |
| RBC count (x 10^6/µl)                  | 4.57 ± 0.27bc     | 5.36 ± 0.57abc             | 5.83 ± 0.39abc       |
| PCV (%)                                | 29.26 ± 1.11ab    | 29.81 ± 1.79bc             | 32.67 ± 1.36bc       |
| MCV (fl)                               | 65.10 ± 2.27abc   | 58.27 ± 2.46abc            | 57.87 ± 2.15bc       |
| MCH (pg)                               | 23.36 ± 1.57a     | 18.75 ± 1.64bc             | 18.59 ± 1.43bc       |
| MCHC (gm/dl)                           | 35.58 ± 1.04a     | 31.72 ± 1.56bc             | 31.76 ± 1.22bc       |
| ESR (mm/24 h)                          | 7.58 ± 1.15a      | 5.12 ± 0.67bc              | 5.22 ± 0.36bc        |
| WBC count (x 10^6/µl)                  | 8.10 ± 0.76a      | 7.61 ± 0.87bc              | 8.72 ± 1.32bc        |
| Lymphocytes (%)                        | 64.29 ± 2.91ab    | 65.24 ± 3.00ab             | 64.41 ± 6.63abc      |
| Monocytes (%)                          | 6.29 ± 0.88a      | 6.41 ± 0.78b               | 5.69 ± 1.16b         |
| Neutrophil (%)                         | 22.88 ± 2.20a     | 23.32 ± 2.97b              | 25.43 ± 5.00b        |
| Eosinophil (%)                         | 5.39 ± 1.24a      | 4.31 ± 0.54b               | 3.83 ± 1.57b         |
| Basophil (%)                           | 1.10 ± 0.35a      | 0.80 ± 0.20a               | 0.70 ± 0.26b         |

Values bearing different superscripts in a row differ significantly (P<0.05) but sharing at least one superscript in a row differ non-significantly.