The present study was performed in 12 buffaloes, six with retained fetal membrane and six normal parturient buffaloes. Blood samples were taken for estimation of some haematological and biochemical constituents. The total leucocyte count, and eosinophil, monocyte and basophil percent did not vary significantly between buffaloes with retention of fetal membranes and normal parturient buffaloes. Neutrophil (percent) in retention of fetal membrane (RFM) cases was significantly ($p<0.01$) lower, whereas lymphocyte (percent) in RFM cases was significantly ($p<0.01$) higher than in the normal parturient buffaloes. The serum total protein in RFM cases did not differ from that in normal parturient buffaloes. The serum calcium and blood glucose levels were significantly ($p<0.01$) lower, whereas the levels of alkaline phosphatase and lactate dehydrogenase (LDH) were significantly ($p<0.01$) higher in RFM cases in comparison to those of normal parturient buffaloes.

Keywords: retention of fetal membrane, haematological, biochemical, placenta, parturient buffaloes.

INTRODUCTION

Retention of fetal membrane is the most important post-partum complication and has a great economic importance in dairy industry. The state of placental maturity and the pathology of the fetal and maternal placenta are considered to be principal factors in retention of the placenta after birth. It may arise out of insufficient uterine contraction, nutritional deficiency, hormonal imbalance and reproductive diseases (Ray et al., 2004). A judicious and timely use of preventive and corrective measures, mainly with the object to remove the exciting cause could be considered as a rational way to prevent the condition. The present study envisages the changes in total leucocyte count, differential leucocyte count, serum calcium, serum glucose, serum total protein, serum alkaline phosphatase and serum lactate dehydrogenase (LDH) in normal parturient buffaloes and buffaloes with retained fetal membrane.

MATERIALS AND METHODS

In this investigation, twelve buffaloes were included, six of which had not shed their placenta within 10 hours after parturition. For comparative study, six normal parturient buffaloes were taken as a control. Blood samples were collected from each animal 10 hours after parturition with retained fetal membrane before administration of treatment and normal parturient buffaloes. Ten milliliters of blood was collected from the jugular vein of each buffalo. Two milliliters of blood was poured in sterile vials containing anticoagulant (ethylene diamine tetra acetic acid @ 2 mg/ml of blood) for haematological studies.

The remaining 8 ml of blood was collected in centrifuge tube and allowed to clot. After clotting, samples were transported immediately to the laboratory and centrifuged at 2500 rpm for 10 minutes (Brar et al., 2002). Serum was collected in sterile vials and kept at -20 °C till biochemical estimations.

The total leucocyte count and differential leucocyte count was estimated as per the procedure described by Jain (1986).
Serum calcium was estimated by the OCPC method (Moorehead and Briggs, 1974), serum glucose by the glucose oxidase (GOD/POD) method (Trinder, 1969), the serum total protein by the Biuret and BCG dye binding method (Anino, 1976), serum alkaline phosphatase by Kind and King’s method (Kind and King, 1954), serum lactate dehydrogenase (LDH) by the colorimetric method (Wootten, 1980). The data were statistically analyzed for group differences with ‘t’ test as per the method described by Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

The mean values of total leucocyte count (thousand/cu.mm.) and differential leucocyte count (percent) are given in Table 1.

The total leucocyte count for buffaloes having retention of fetal membrane and normal parturient buffaloes were non–significantly different. Das (1984) and Ray et al. (2004) found similar findings. However, the present values for both groups of animals were within the normal range of 4x10^2 – 12x10^2 (Benjamin, 1985).

In the present study, the neutrophil (percent) in buffaloes with retention of fetal membrane was significantly (p<0.01) lower than buffaloes having normal parturition. On the contrary, the lymphocyte (percent) for buffaloes with retention of fetal membrane was significantly (p<0.01) higher than the normal parturient buffaloes. These findings are in accordance with Tiwari et al. (2001) and Ray et al. (2004). This variation in neutrophil might be due to bone marrow depression or to lack of maturation of neutrophils during parturition; moreover, lymphocytosis is seen in inflammatory conditions, bacterial invasion and endocrine imbalance (Ray et al., 2004). In the present study, eosinophil, monocyte and basophil percents had no significant difference in buffaloes with retention of fetal membrane from that of normal parturient buffaloes. These white blood cells found in the study were within normal range (Benjamin, 1985).

The mean values of serum calcium, alkaline phosphatase, total protein, lactate dehydrogenase and blood glucose are given in the Table 2.

The serum calcium and blood glucose levels were significantly lower (p<0.01) in buffaloes with retention of fetal membrane than normal parturient buffaloes. These observations corroborate with the findings of Dutta and Dugwekar (1983b), Mohanty et al. (1994) and Mandali et al. (2002). The findings of the present study suggest that the lower calcium concentration and lower energy level might be responsible for the occurrence of retention of fetal membranes in buffaloes. The disturbance in the calcium metabolism and its utilization by the tissue results in the atony of the internal organs. During advanced stages of pregnancy, there is excessive mobilization of calcium. It is therefore suggested that probably less availability of glucose and calcium to the uterine tissues results in atony of the uterus, with decreased contraction and retention of fetal membranes (Mohanty et al., 1994).

There was no significant difference in the serum total protein between the buffaloes with retention of fetal membrane and the normal parturient buffaloes. Similar findings were reported by Dutta and Dugwekar (1983b) and Mandali et al. (2002).

The average serum alkaline phosphatase and LDH levels were significantly (p<0.01) higher in buffaloes with retained fetal membrane as compared to normal parturient buffaloes. Similar findings for alkaline phosphatase were reported by Sharma et al. (1991), Mohanty et al. (1994) and Ray et al. (2004). For LDH, present findings are in accordance with Dutta and Dugwekar (1983a) and Mandali et al. (2002). The increased levels of alkaline phosphatase and LDH in the serum might result due to leakage from necrotic or damaged cells (Wootten, 1980). Retention of fetal membrane is commonly associated with small portion of necrotic epithelium between the chorionic villi and the cryptal walls. The degree of placentitis that may develop as a complication secondary to retained fetal membranes could vary from mild peripheral type of necrosis involving only the villi to a severe necrosis involving the entire cotyledons and a part or all of the caruncles (Roberts, 1986).
Table 1. Haematological profile (Mean±SE) in buffaloes with and without retention of fetal embranes.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Parameters</th>
<th>Normal parturient Buffaloes (n=6)</th>
<th>Buffaloes with retention of fetal membrane (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Total leucocyte count (thousand/cu.mm.)</td>
<td>7.77±0.19</td>
<td>7.58±0.18</td>
</tr>
<tr>
<td>2.</td>
<td>Neutrophil (percent)</td>
<td>41.00±1.25**</td>
<td>25.66±1.22</td>
</tr>
<tr>
<td>3.</td>
<td>Lymphocyte (percent)</td>
<td>46.33±1.33</td>
<td>58.50±2.04**</td>
</tr>
<tr>
<td>4.</td>
<td>Eosinophil (percent)</td>
<td>7.66±0.69</td>
<td>9.33±0.77</td>
</tr>
<tr>
<td>5.</td>
<td>Monocyte (percent)</td>
<td>4.83±0.72</td>
<td>6.33±0.80</td>
</tr>
<tr>
<td>6.</td>
<td>Basophil (percent)</td>
<td>0.16±0.15</td>
<td>0.16±0.15</td>
</tr>
</tbody>
</table>

** Highly significant (p<0.01)

Table 2. Biochemical profile (Mean±SE) in buffaloes with and without retention of fetal membranes.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Parameters</th>
<th>Normal parturient Buffaloes (n=6)</th>
<th>Buffaloes with retention of fetal membrane (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Calcium (mg/100 ml)</td>
<td>7.98±0.07**</td>
<td>5.53±0.14</td>
</tr>
<tr>
<td>2.</td>
<td>Alkaline phosphatase (KA units/100 ml)</td>
<td>17.25±0.21</td>
<td>18.62±0.15**</td>
</tr>
<tr>
<td>3.</td>
<td>Total protein (gm/100 ml)</td>
<td>6.53±0.26</td>
<td>6.47±0.28</td>
</tr>
<tr>
<td>4.</td>
<td>Lactate dehydrogenase (IU/l)</td>
<td>331.00±9.98</td>
<td>413.00±8.40**</td>
</tr>
<tr>
<td>5.</td>
<td>Blood glucose (mg/100 ml)</td>
<td>57.24±0.46**</td>
<td>53.10±0.25</td>
</tr>
</tbody>
</table>

** Highly significant (p<0.01)
CONCLUSION

Estimation of total leucocyte count, differential leucocyte count, serum calcium, serum glucose, serum total protein, serum alkaline phosphatase and serum lactate dehydrogenase (LDH) at parturition are of diagnostic importance. These constituents may be helpful for predicting the occurrence of fetal membrane retention and for instituting prophylactic measures for prevention of retention of fetal membrane in buffaloes.

REFERENCES