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Case Report on Incidence of Fetal and Maternal Dystocia and their Haemato-Biochemical Alterations in Cross Bred Animals

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ABSTRACT

The study was conducted to ascertain the foetal and maternal cause for dystocia in cross bred cows presented to the department of Veterinary Gynaecology and Obstetrics, Veterinary College, Bangalore from April 2015 to May 2016. The study reveals stress in dystocia did not significantly alters the hematological parameters except for eosinophils and monocytes. A significant decreased in calcium concentration and an increased in blood glucose levels has been recorded. The body temperature and respiratory rate was significantly higher in cows with fetal dystocia as compared to eutocia cows.

Key words: *Eosinophils, Monocytes, Fetal dystocia, Cross bred*

INTRODUCTION

A difficult or dystocial birth often means that assistance must be provided during delivery. It is difficult to assess the internal state of the cow in terms of what pain or discomfort animal experiences so, from a practical point of view, dystocia is normally described in terms of the level of assistance that is required. The scale typically ranges from no assistance (or unobserved), to some assistance by the farmer or veterinarian and through to caesarean section. Internationally, reported prevalence of severe difficulties in dairy cattle varies from two per cent to 22 per cent. However, assistance at calving (including lower degrees of difficulties) is much more prevalent, varying from 10 per cent to over half of calvings across countries, breeds and farms[1]. The most common cause of dystocia is a physical incompatibility between the pelvic size of the dam and the size of the calf (foeto-pelvic incompatibility). Because of this, a high calf birthweight is known to be an important risk factor for dystocia, as well as the choice of sire, breed and length of gestation. It also follows that male calves are also more likely to experience a dystocial birth because of their higher birthweight. Pelvic size is influenced by the stage of maturity of the cow, so a smaller size of pelvis contributes to the higher prevalence of dystocia in heifers. Foetal malpresentation, incomplete dilation of the vulva and cervix, and the presence of twin calves are also major risk factors for[2].

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The effects of dystocia on the cow is associated with a reduction in milk yield in the subsequent lactation, and poorer cow fertility. Higher culling rates have also been observed, which have negative consequences for farm economics as well as for cow welfare. In general, however, there has been less attention paid to the effects of a dystocial birth on the surviving calf. There are a number of areas where the calf might be affected by a dystocial birth and studies have investigated growth, survival, health and welfare[3]. A number of studies have shown that the calf or twin calves are more likely to be stillborn or die shortly after a dystocia. The main causes of perinatal death following dystocia are asphyxia or trauma[4].

The fetal-maternal size mismatch is the most frequent cause of dystocia in primiparus dams, while fetal malpresentation and/or maternal related causes is the most frequent causes of dystocia in multiparus dairy cows. Overall, the frequency of dystocia is higher in primiparus than multiparus cows. However, in some dairy herds and especially in primiparus dams, more than half of the calves required assistance during calving[5]. A dystocial birth can have profoundly negative effects on the survivability, health and welfare of the calf. Reducing overall levels of dystocia, or severity of dystocia, will have positive impacts on the health and welfare of calves but also on the economics of the farm. This can be achieved by choice of sires with good calving ease ratings. Surveillance at calving time may allow appropriately timed intervention, which is particularly important for malpresentations. Calves born from difficult births may require extra care, in the form of colostrum, thermal support and healthcare. There is also the possibility that calves from difficult births could benefit from some form of therapeutic treatment or extra care in the postnatal period. The long-term effects of a dystocial birth on the health and behaviour of calves clearly illustrates that prevention or mitigation of the effects will improve calf survival and, ultimately, farm sustainability[6,7].

The present study was designed to ascertain multifarious caused for dystocia, main focus on foetal or maternal cause for dystocia in cross bred animals that were presented to Department of Veterinary Gynaecology and Obstetrics, Veterinary College, Bangalore.

MATERIAL AND METHODS

Experimental animals: The present study was conducted on forty crossbred cows maintained by the farmers in and around Bangalore city with a history of calving difficulty presented to the clinic of the Department of Veterinary Gynecology and obstetrics, Veterinary College, Bangalore, Karnataka Veterinary Animal and Fisheries Sciences University, during April 2015 to May 2016 were utilized for the study. Immediately after presentation, complete history regarding the obstetrical clinical status of the cows was obtained. Information regarding age, parity of the dam and time elapsed from onset of labour to presentation were recorded. The clinical status of each animal was noted down and detailed reproductive tract examination was conducted to know the cause of dystocia as well as to record any abnormalities of vulva (*viz*. edema, bruising and necrosis), presence of vaginal discharge and presentation of extremities of fetuses outside the vulva were also recorded. Body temperature, respiratory rate, pulse rate and heart rate were recorded for all cows.

Interval from onset of labour to its reference: In order to analyse the influence of duration of dystocia on the outcome of caesarean section and prognosis of the animal, the information regarding the approximate duration of dystocia was obtained and were classified into following four groups:

a. Animals referred within 12 hours from the onset of labour.
b. Animals referred between 12 to 24 hours after the onset of labour.
c. Animals referred between 24 to 48 hours after the onset of labour.
d. Animals referred 48 hours after the onset of labour.

Viability and condition of the fetus: The number of cases where live, dead, dead and emphysematous fetuses were encountered in relation to the approximate duration of dystocia was obtained for analysis of cases.

Causes of dystocia: The clinical records were analyzed to assess the incidence of various causes of dystocia and the same were classified broadly into either maternal or fetal in origin[8]. In each type fetal or maternal dystocia encountered, information regarding the viability and sex of the calf, obtained were utilized to relate the viability and sex of the calf with the various types of dystocias. Caesarean section was performed with Epidural and line infiltration of local anesthetic (2 % lignocaine hydrochloride). Surgical intervention was made via left ventrolateral site. After removal of the fetus, loose fetal membranes and evacuation of the fluid, the uterus was sutured in two layers using chromic catgut (no. 1) in an inversion (Lambert) pattern. Abdominal wall was closed. Intravenous fluid (Ringers Lactate) therapy was instituted perioperatively. Analgesics and antibiotics were administered preoperatively on the day of operation and same drugs were used for another 4 to 6 days, respectively. Antiseptic dressing of the incision line was continued twice daily from day of operation up to 5 days till suture removal. All the animals were discharged on the day of surgery. Postoperative care was assigned to the local field veterinarian. The progress of the cases was ascertained regularly from the owners on telephone every alternate day till suture removal. The suture was removed on 10^{th} postoperative day. Survival of dams and post-partum complications if any, were also recorded.

Blood collection and processing: Blood samples were collected from all the cows suffering from dystocia before Caesarean section. Blood samples were also collected from thirty-one eutocia cows within fifteen minutes after parturition, which served as control.

About 20 ml of blood was collected in two parts, one with and other without anticoagulant, from each animal aseptically in clean, sterilized test tubes by jugular vein puncture method. The blood samples containing anticoagulant were used for estimating hematological parameters including red blood cells (RBC) count, packed cell volume (PCV), hemoglobin (Hb), white blood cell (WBC) count and differential leukocyte counts. Serum was separated from blood samples without anticoagulant and stored at -20°C until analyzed for calcium and total protein levels. The blood serum calcium and total proteins were estimated by spectrometric methods using commercial kits as per the instructions of the manufacturer.

Statistical analysis: The data generated on different causes of dystocia cows was tabulated according to, age, parity and season, sex of fetus, interval from onset of labour to the presentation, viability and condition of fetus and maternal survival rate. To establish the temporal relationship between the duration of dystocia, condition of the birth canal, and the maternal/fetal recovery rate were compared by Univariate Chi-square test as per the methods of Steel *et al*.[9]. Mean values (± SE) for the concentrations of various hematological and biochemical parameters for eutocia and dystocia cows were computed. In order to ascertain the magnitude of variation in concentrations of various hematological and biochemical parameters among cows of eutocia, maternal and foetal dystocia cows, the data were analyzed statistically using Analysis of Variance[9]. Tukey test was applied for multiple means comparison, where necessary. In order to ascertain magnitude of variation in various parameters between eutocia and dystocia cows, cows survived and dead following caesarean section, the data were subjected to two tailed paired T-test. For all tests, values of $P<0.05$ were considered significant.

RESULTS AND DISCUSSION

Incidence of fetal and maternal dystocia:

The incidence of dystocia due to fetal and maternal causes was 57.50 and 42.50 percent, respectively (Table 1). Higher incidence of

foetal dystocia was observed than maternal dystocia. These findings are well supported by the previous studies[10,11,12,13] in buffaloes and[10,14] in cattle.

Incidence of maternal causes of dystocia:

Among the maternal causes (42.50%) incomplete cervical dilatation (20.00%), uterine torsion (15.00%) and narrow pelvis (7.50%) were major causes of dystocia (Table 2). The present findings are in concurrence with those of Buchoo *et al*.[15] who also reported higher incidence of incomplete cervical dilatation among the maternal causes of dystocia in cows and similar findings were observed by Majeed *et al*.[16] in cattle. The incidence of 7.50% narrow pelvis recorded in the present study is almost closer to the reported incidence of 8.33% by Buchoo *et al*. [15] in cows.

Uterine torsion: The incidence of torsion of uterus accounts for 15.00 per cent of all dystocia. Previous studies reported the incidence of uterine torsion that varied between 7 to 30 per cent[17,18] in cows.

Pre and Post cervical torsion: The incidence of pre and post cervical torsion was observed to be 7.50 and 7.50 per cent, respectively (Table 2). The incidence of pre-cervical torsion recorded in is almost closer to 6.50% reported by Prabhakar *et al*.[19]. The results of the present study are in tandem with those of Singh *et al*.[20] who reported equal frequency of pre- and post-cervical torsion which is similar to that obtained in current investigation. However, some studies reported that the incidence of precervical torsion was lower than post cervical uterine torsion[21,22,23]. In contrast, few studies reported higher proportion of post cervical torsion in cattle[24,25,26].

Incomplete dilatation of cervix: The incomplete dilatation of cervix is the major cause of dystocia in cows accounting for 20.00 per cent of maternal dystocia cases. The observed incidence is almost closer to the reported incidence of 19.10 % by Singla *et al*.[27], Prasad *et al*.[28], Nanda *et al*.[29] and Purohit *et al*.[30].

Narrow pelvis: The narrow pelvis accounted for 7.57 per cent of maternal dystocia cases which is almost closer to the reported incidence of 6.74% by Singla *et al*.[27].

Incidence of Different causes of foetal dystocia:

Among foetal causes of dystocia, the incidence of abnormal presentation, position and postural defects and congenital abnormalities were 45.50, and 15.00 percent, respectively. The incidences of dystocia due to anterior and posterior presentations of fetus was 35.00 and 7.50 per cent, respectively while those of head and limb deviations were 22.50 and 12.50 per cent respectively. Among the posterior presentations, the incidence of breach presentation, hock flexion and extended hind limbs were 2.50, 2.50 and 2.50 per cent, respectively (Table 3). The incidence of fetal dystocia was 57.50 % which is much higher than the reported incidence of 23.08 per cent[31], 21.11per cent[32] reported in previous studies, but was compatible with dystocia rates of 56.25[33] and 56.25 per cent[34] and lower than the reported incidence of 68.10, 73.00, 66.67 and 83.74 per cent reported by Majeed *et al*., Kalkan *et al*.[35], Purohit and Mehta[36] and Fanti *et al*.[37], respectively. The difference between the present study and previous reports may have been due to variations in breed, age, parity, season, geographical area as well as to number of animals screened may have contributed to the observed discrepancies.

Congenital abnormalities: The congenital abnormalities of the foetus causing dystocia were recorded in 15.00 per cent of the total dystocia cases. The incidences of dicephalus, conjoined twins, shistosomus reflexes and hydrocephalus were 5.00, 2.50, 5.00 and 2.50 per cent, respectively with an overall incidence of 15.00 per cent congenital fetal abnormalities.

Dams survival rate: The survival rate of the cows which were in labour for less than 12 hours, 12-24, 24-48 and more than 48 hours was 30.00, 20.00, 0.00 and 12 .50 per cent, respectively were depicted in table 3 with an overall survival rate of 62.50 per cent.

Anterior presentation:

The incidence of dystocia due to anterior presentation of fetus was recorded in 35.00 per cent of all fetal causes and maximum numbers of fetuses were in anterior longitudinal presentation (35.00%). The present report was in accordance with Buchoo *et al*. who reported the higher incidence of fetal dystocia when the fetus was in anterior longitudinal presentation. The higher incidence of fetal dystocia in anterior presentation as noticed in the present study may be subscribed due to easily movable neck or head and more length of limbs postural defects of fetuses were noticed more frequently than abnormal position/ presentation. Consequently, foetal dystocia in ruminants is more common than litter bearing species[38].

Deviation of the head: The incidence of the head deviation recorded in the present study was 22.50 per cent, which was one of the major and serious causes of fetal dystocia (Table 3). In previous studies, the incidence of head deviation recorded varied from 2.5-20.4% in cows[39,40,36] and observed incidence of head deviation in the present study was marginally higher than that of previous reports.

Limb flexion: In the present study, fore limb flexion was observed in 12.50 per cent of all dystocia cases studied. Carpal flexion was one of the most common forms of maldispositions in cranial presentations of the fetus resulting in dystocia in cattle[41,36,42,32]. The recorded incidence of 12.50 per cent limb flexion observed in the present study was almost closer to 12.04 per cent reported by Mutiga *et al*.[41].

Posterior presentation:

The incidence of the caudal presentation recorded in the present study was 7.50 per cent (Table 3). Previous studies recorded the incidence of caudal presentation dystocia in dairy cows to vary from 3.8-17 %[43,16,36]. In beef cows, breech presentations were seen in 8.2%[39] whereas Nix *et al*.[40] recorded only one breech presentation out of 20 abnormal births.

Breech presentation: In the present study the incidence of breech presentation, hock flexion and extended hind limbs was found in 2.5 % each (Table 3). These results were comparable to 3.80 per cent reported by Purohit and Mehta[36]. However, the recorded values in the present study were lower than those of Holland *et al.*[39] who observed 8.20% incidence of breech presentation in cows. In the present study the incidence of hock flexion and extended hind limbs was found in 2.5 % each (Table 10). Markandeya *et al*.[38] and Buchoo *et al*.[15] have also reported few cases of hock flexion and extended hind limbs as a cause of dystocia in their studies.

Congenital abnormalities: A wide variety of conjoined twins have been described in cattle. In the present study, congenital abnormalities of the foetus causing dystocia was recorded in 15.00 per cent of the total dystocia cases (Table 3) The incidences of dicephalus, conjoined twins, Schistosomus reflexes and hydrocephalus, were 5.00, 2.50, 5.00 and 2.50 per cent, respectively, with an overall incidence of 15.00 per cent congenital fetal abnormalities. In a previous study, Singla *et al*.[27] reported that the congenital defects are associated with 3.37 % of dystocia in cows. While in other reports, the incidence of monstrosities reported for cow was 0.5 %[44] whereas an incidence of 7.9 %[45] and 12.8 %[46] has been reported for buffaloes. Fetuses with congenital defects are dead at birth, and dystocia due to monsters is usually relieved by caesarean section since fetotomy is of limited scope.

Hydrocephalus: In the present study, hydrocephalus as a cause of dystocia was found in 2.5 % of all dystocia cows. The condition has been described in cows[47,36], to relieve dystocia, caesarean section when required[48,49].

Schistosoma reflexus: Schistosoma reflexus has been reported in cattle[50,51]. The incidence of Schistosomus reflexus as a cause of bovine dystocia was found to be 1.3 %[52]. In the present study, Schistosoma reflux was encountered in 5.00 % of dystocia cows

Incidence foetal monstrosities: In previous studies the incidence of monstrosities reported for cow was 0.5%[44], 1.1%[32] whereas an

incidence of 7.9%[45] to 12.8%[46] has been reported for buffalo. In the present study, dicephalus fetus and conjoined twins were found in 5.00 and 2.50 per cent respectively from among the dystocia cows. In a previous study, Silva Filho *et al*.[53] have also recorded dicephalus and conjoined twins causing dystocia in cows.

Caesarean section: Caesarean section was reported to be an effective method for treatment of most types of dystocia and was safe for dam as well as fetus, especially when performed as early as possible after onset of labor. The most common indications for caesarean section in cow are failure of cervix to dilate and relative or absolute oversize of fetus[54,8]. In rare cases, fetal emphysema, uterine torsion and monsters[55] may require a caesarean section to deliver the fetus[54]. In the present study, all the forty dystocia cases presented with various causes were subjected to Caesarean section.

Survival rates of the dams: Survival rates of the dams following caesarian operation among 40 cases of dystocia are presented in Table 4. In the present study irrespective of duration of dystocia, the overall survival rate of after caesarian operated cows was 62.50 per cent. Consistent with the results of this study, previous study on survival of dams following caesarian operation in dystocia cows have reported survival rate of 62.50 per cent. However, a much lower survival rate of 25.00 per cent, 34.90 per cent, 46.30 per cent reported in previous studies and higher incidence of 66. 67 per cent and 76.90 per cent[36] were reported. The difference between the present study and previous reports may have been due to condition of dam at presentation, duration of dystocia, previous handling may have contributed to the observed discrepancies[26,56]. On perusal of Table 4, it is evident that the survival rate of the cows which were in labour for less than 12 hours, 12-24, 24-48 and more than 48 hours was 30.00, 20.00, 0.00 and 12 .50 per cent, respectively. These observations suggested that the survival rate was significantly reduced with the increasing duration of dystocia. The present observations are in consonance with those of Saxena *et al*., Prabhakar *et al*.[19,23], Sharma, Srinivas *et al*., Dhindsa *et al*. and Mane and Bhangre who have also reported that the survival rate of the dams showed a significant inverse relationship with the duration of dystocia, indicating lower survivability was associated with delay in presenting dystocia cases in cows and in buffaloes.

Out of twenty-eight cows which were in labour for less than 24 hours, the survival rate of dam was 50.00 per cent as against 12.50 per cent survivability in cows experiencing dystocia for more than 24 hours. The time elapse since dystocia onset and the performance of the operation is an important determinant of the outcome. Dam survival rates are high (64.7% to 100.0%) when the operation is performed within 24-36 h of dystocia onset whereas survivability may decrease to 25%-33.0% when the operation was performed after 72 h.

Haematological profiles of cows survived and dead after caesarian section:

The mean values of various erythrocyte indices in dead and survived crossbred cows are given in Table 5. The total RBC count in dead cows had numerically higher erythrocyte count compared with that of the survived cows, however, the difference was non-significant. The difference in hemoglobin, PCV, TLC levels, Neutrophil count, eosinophil count, monocyte count between dead and survived cows was not significant. Whereas the mean lymphocyte count showed significant variations among dead and survived cows

Mean serum values of hematobiochemical parameters of cows survived and dead after caesarian operation were depicted in Table 5. No significant ($P>0.05$) differences in the blood glucose, serum calcium, total protein concentration was found between survived and dead cows.

Effect of maternal and fetal dystocia on physiological attributes

The mean values of various physiological indices in eutocia, maternal and foetal dystocia crossbred cows are depicted in Table 6. Rectal

temperature was significantly higher in dystocia (102.30± 0.24°F) than in in eutocia (101.10±0.17) cows, respectively. Previous studies reported that dystocia showed non-significant increase in rectal temperature in dystocia cows. The respiratory rate The present study revealed that effect of dystocia on respiratory rate (per minute) of cows was not significant (Table 6). However, dystocia showed a marginal increase (28.65± 1.33) in respiratory rate than eutocia cows (25.06± 0.47). These findings are supported by the reports of Seyrek-Intas *et al*. who also observed no significant variations in the respiratory rate among eutocia and dystocia cows. The heart beats of the studied cows was not significant However, dystocia showed a marginal increase (76.00± 2.04) in respiratory rate than eutocia cows (73.00± 1.40) which are at variance with those reports of Rodrigues *et al*. who observed tachycardia immediately after calving in both eutocia and dystocia cows. The pulse rate of both eutocia and dystocia cows showed no- significant difference in the present study. However, Seyrek-Intas *et al*., Derar and Abdel-Rahman and Mohammad and Abdel-Rahman reported a significant increase in pulse in dystocia cows.

Effect of maternal and fetal dystocia on hematological attributes:

Erythrocyte indices: The mean values of various erythrocyte indices in eutocia, maternal and foetal dystocia crossbred cows are depicted (Table 7). The mean RBC count, hemoglobin concentration, mean total leucocyte count showed no significant variations among the normal parturient, cows with maternal and foetal dystocia. The differential leukocyte count revealed, the mean neutrophils count was found to be significantly higher ($P<0.05$) in cows suffering with fetal dystocia compared with that of maternal dystocia and healthy eutocia cows. However, the differences in the neutrophil count between maternal and dystocia cows were not significant. No significant variations in the lymphocyte count among eutocia, maternal and foetal dystocia cows was observed. A significantly higher eosinophil count was observed in eutocia cows as compared to cows with maternal and foetal dystocia ($P>0.05$). However, there was no significant difference in monocyte count between fetal and maternal dystocia cows was observed.

Effect of maternal and fetal dystocia on blood bio-chemical attributes:

In the present study, the mean blood glucose values, mean serum calcium levels and plasma protein levels were found to be non-significantly related between eutocia cows compared to those cows with maternal and foetal dystocia.

Table 1: Incidence of fetal and maternal dystocia

Causes of dystocia	Number of cases	Percentage
Maternal	17	42.50
Fetal	23	57.50
Total	40	100

Table 2: Incidence of different causes of maternal dystocia

Maternal causes	Number of cases	percentage
Pre cervical Uterine torsion	03	7.5
Post cervical Uterine torsion	03	7.5
Non or partial dilation of cervix	08	20
Narrow /abnormal pelvis	03	7.5
Total	17	42.5

Table 3: Incidence of different causes of fetal dystocia

Fetal dystocia		Duration of dystocia (hours)				
		< 12	12---24	24---48	>48	Total
A. Anterior Presentation-	1.Head deviation	04 (10.0)	02(5.0)	01(2.5)	02(5.0)	09(22.5)
	2.Limb flexion	01(2.5)	03(7.5)	00	01(2.5)	05(12.5)
	Total	05(12.5)	05(12.5)	01(2.5)	03(7.5)	**14(35.0)**
B. Posterior Presentation-	1.Breech presentation	00	00	01(2.5)	00	01(2.5)
	2.Hock flexion	00	01(2.5)	00	00	01(2.5)
	3.Extended hind limbs	01(2.5)	00	00	00	01(2.5)
	Total	01(2.5)	01(2.5)	01(2.5)	00	**03(7.5)**
Congenital abnormalities-	1.Dicephalus	01(2.5)	01(2.5)	00	00	02(5.0)
	2.conjoined twins	01(2.5)	00	00	00	01(2.5)
	3.schistosoma reflexes	01(2.5)	01(2.5)	00	00	02(5.0)
	4.Hydrocephalus	01(2.5)	00	00	00	01(2.5)
	Total	04(10.0)	02(5.0)	00	00	06(15.0)
Grand total		10(25.0)	08(20.0)	02(5.0)	03(7.5)	**23(57.5)**

Note: Values in parenthesis refers percentage

Table 4: Dams survival rate

Duration of dystocia	**Maternal dystocia**		**Fetal dystocia**		**Total**	
	Survived	**Dead**	**Survived**	**Dead**	**Survived**	**Dead**
< 12 hours	3 (7.50)	1 (2.50)	9 (22.50)	1 (2.50)	12 (30.00)	2 (5.00)
12-24 hours	4 (10.00)	2 (5.00)	4 (10.00)	4 10.00)	8 (20.00)	6 (15.00)
24-48 hours	00	2 (5.00)	00	2 (5.00)	00	4 (10.00)
> 48 hours	3 (7.50)	2 (5.00)	1 (2.50)	1 (2.50)	5 (12.50)	3 (7.50)
Total	10 (25.00)	7 (17.50)	15 (37.50)	8 (20.00)	25 (62.50)	15 37.50)

Note: Values in parenthesis refers percentage

Table 5: Haematological and Hematobiochemical parameters of survived and dead cows after caesarean operation

Parameters	**Survived cows**	**Dead cows**
RBC (10^6/µl)	6.32 ± 0.21^{A}	6.64 ± 0.55^{A}
Hb (g/dl)	9.38 ± 0.309^{A}	9.48 ± 0.77^{A}
PCV (%)	31.8 ± 1.43^{A}	34.0 ± 2.99^{A}
TLC (10^3/µl)	11.9 ± 1.17^{A}	20.9 ± 5.37^{A}
Neutrophil (%)	63.0 ± 4.43^{A}	55.3 ± 4.99^{A}
Lymphocytes (%)	35.8 ± 3.49^{A}	45.3 ± 4.56^{B}*
Eosinophil (%)	1.92 ± 0.21^{A}	2.13 ± 0.23^{A}
Monocyte (%)	0.560 ± 0.17^{A}	0.467 ± 0.16^{A}
Glucose (mg/dL)	68.8 ± 3.06^{A}	82.7 ± 8.7^{A}
Calcium (mg/dL)	7.13 ± 0.43^{A}	6.73 ± 0.56^{A}
Total Protein (mg/dL)	6.45 ± 0.22^{A}	6.06 ± 0.26^{A}

Note: Means bearing different superscript values vary significantly (P<0.05)

Table 6: Physiological Parameters of eutocia with maternal and fetal dystocia cows

Parameter	Eutocia	Maternal	Fetal
Body Temperature (°F)	101.10 ± 0.17^{A}	101.80 ± 0.26^{A}	102.60 ± 0.36^{B}
Respiratory rate per min	25.06 ± 0.47^{A}	25.94 ± 1.41^{A}	30.65 ± 2.00^{B}
Heart rate (bpm)	73.00 ± 1.40^{A}	74.53 ± 2.97^{A}	77.01 ± 2.83^{A}
Pulse rate per min	58.72 ± 1.28^{A}	58.47 ± 2.56^{A}	60.13 ± 3.09^{A}

Note: Means bearing different superscript values vary significantly (P<0.05)

Table 7: Haematological and Haemato-biochemical parameters of cows with normal parturition, fetal and maternal dystocia

Parameter	Eutocia	Maternal	Fetal
RBC (10^6/µl)	6.10 ± 0.24^{A}	6.40 ± 0.42^{A}	6.50 ± 0.30^{A}
Hb (g/dl)	9.10 ± 0.22^{A}	9.20 ± 0.65^{A}	9.40 ± 0.42^{A}
PCV (%)	32.00 ± 1.70^{A}	34.00 ± 2.40^{A}	32.00 ± 1.70^{A}
TLC (10^3/µl)	17.70 ± 1.65^{A}	16.50 ± 4.44^{A}	14.40 ± 2.11^{A}
Neutrophils (%)	58.10 ± 2.53^{A}	56.90 ± 5.49^{A}	62.50 ± 4.23^{A}
Lymphocytes (%)	39.70 ± 3.16^{A}	44.6 ± 4.78^{A}	35.50 ± 3.29^{A}
Eosinophil (%)	4.06 ± 0.37^{A}	1.88 ± 0.18^{B}	2.087 ± 0.24^{B}
Monocyte (%)	3.94 ± 0.52^{A}	0.35 ± 0.14^{B}	0.69 ± 0.18^{B}
Blood glucose (mg/dL)	65.74 ± 3.24^{A}	79.41 ± 7.59^{B}	70.09 ± 3.73^{B}
Calcium (mg/dL)	7.68 ± 0.38^{A}	6.302 ± 0.50^{A}	7.503 ± 0.44^{A}
Total Protein (mg/dL)	6.77 ± 0.19^{A}	6.17 ± 0.30^{A}	6.40 ± 0.20^{A}

Note: Means bearing different superscript values vary significantly (P<0.05)

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CONCLUSION

In conclusion, the hematobiochemical alteration alarm the intensity of stress imposed by dystocia in cows and this impact of stress can be minimized after planning a proper therapeutic regimen on the basis of these alterations. The present study revealed that the stress of dystocia in cows did not significantly (P<0.05) alter haematological attributes except for eosinophil and monocyte count. The calcium concentrations decreased in dystocia affected cows. A significant increase in blood glucose levels of dystocia affected cows is discounted for stress associated increase in cortisol and lowered insulin levels. In conclusion, dystocia has a profound stress full effect on cows and especially is associated with metabolic dysfunction as evidenced by marked increase blood glucose concentrations. The body temperature and respiratory rate was significantly higher in cows with fetal dystocia as compared to eutocia cows. But the pulse, respiratory and heart rate showed no significant alterations in dystocia affected cows as compared to eutocia cows, signifying that stress of dystocia may not profoundly influence the pulse, heart and respiratory rate for longer duration, because of sustained elevated levels of cortisol.

CONFLICT OF INTEREST: Non-Declared

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