SUMMARY

The present study was planned with the objectives of evaluation and critical analysis of obstetrical procedures and therapeutic techniques adopted for the handling of dystocia and appraisal of the blood profile of dystocia distressed bovines (cattle and buffaloes) of Himachal Pradesh. First part of the study comprised of clinical evaluation, blood hormone, hematological and biochemical investigation of the cases presented in TVCC. Second part of the study included a survey of cases presented under field conditions and was conducted through questionnaires and field visits to various districts of Himachal Pradesh.

Overall 36 dystocia affected bovines (24 cows and 12 buffaloes) that were presented in the Teaching Veterinary Clinical Complex (TVCC) of DGCN College of Veterinary and Animal Sciences, Palampur were included in the study. Fifteen animals (9 cows and 6 buffaloes) that calved normally were included for comparative study.

Complete history was recorded and a detailed clinical examination done to determine etiology and suitable management of these dystocia affected animals. Three blood samples were collected from each animal (dystocial and eutocial) viz; before parturition, just after parturition and at 24 hours postpartum in three separate tubes for separation of plasma, serum and for hematological examination.

The hormones *i.e.* cortisol, estradiol-17β and progesterone were estimated using Chemiluminiscence Immuno Assay (CLIA) Strip Reader. Hematological parameters were determined using Auto Hematology Analyser (BC 2800 Vet). Minerals were estimated from plasma using Atomic Absorption Spectrophotometer and Flame Photometer. The blood biochemical profiling was done using plasma with semiautomatic biochemistry analyzer Photometer 5010. To study the effect of dystocia on certain postpartum reproductive parameters data from pluriparous animals was collected for previous normal calving and compared with present dystocial calving.

For collection of field data a questionnaire was designed and was sent to Veterinary Officers posted in veterinary institutions in different districts of Himachal Pradesh to identify the
pattern of dystocia cases presented and obstetrical procedures adopted for the handling of dystocia under field conditions in the state.

Amongst the 24 dystocia affected cows presented in TVCC, maternal factors caused dystocia in 71.0 per cent whereas; fetal factors caused dystocia in 29.0 per cent cows. Among maternal factors, incomplete dilatation of cervix was responsible for maximum number of dystocias (25.00%). Among fetal factors, flexions of head/neck and limbs caused dystocia in 25.00 per cent, of the total cases. Mustard oil (4) and linseed oil (1) were used for lubrication purpose. In the present study, mutations were used to relieve dystocia in 16 cows whereas; cesarean section was the treatment of resort in eight of them. Fetus was male on 16 occasions and female in 8 cases. Data on postpartum reproductive parameters viz., peak milk yield, first estrus and calving to conception interval postpartum was obtained from ten pluriparous cows. There was a decrease in peak yield following dystocial parturition (6.70±0.67) than normal calving (7.50±0.70) however, the difference was not significant. Among other reproductive parameters, a significant (p<0.05) delay in exhibition of first estrus postpartum was noticed in dystocial parturition (159 days) in comparison to normally calved cows (114 days) in the present study. The delay in conception postpartum was of 47 days, (125 days vs 172 days).

Amongst the 12 dystocia affected buffaloes presented in TVCC, six animals were pluriparous and six were primiparous. Maternal factors were diagnosed as etiology of dystocia in 5 buffaloes whereas, 7 animals suffered with fetal dystocia. Among maternal factors in this study, uterine torsions were responsible for 4 (33.33%) dystocia cases. Among fetal factors six cases (50.00%) of dystocia were caused by flexions of head/neck and limbs. Mutations and forced tractions were a treatment of choice to relieve dystocia in 10 (83.34%) whereas, rest 2 (16.66%) cases were relieved by cesarean section. The peak milk yield in dystocia affected buffaloes was reduced by 1.2 l/day than those calving normally. First estrus postpartum was delayed significantly (p<0.05) by 68 days and calving to conception interval significantly increased (p<0.05) by 75 days in dystocial birth in the same animal when compared to previous eutocial birth.

For analysis of clinical status and obstetrical interventions adopted for the handling of dystocia in cows in field veterinary institutions of Himachal Pradesh a total of 314 dystocia affected cows were included under field survey. Forty six of these animals were Jersey, 8 were Holstein Friesian, 206 were crossbred and 54 were of local non descript breed. In majority of the cases (68%) no lubricant was used whereas, mustard oil (10%), refined oil (10%), were used as lubricant in majority of the cows. Maternal dystocia was responsible for 144 dystocia cases whereas, fetal factors caused dystocia in 170 animals. Among maternal dystocia narrow pelvis, uterine inertia, incomplete dilatation of cervix and uterine torsions were the cause of
dystocia in 40 (12.74%), 38 (12.10%), 38 (12.10%) and 28 (8.92%) animals, respectively. Among fetal factors deviations of head/neck (13%) and limb flexions (26%), were major cause of fetal dystocia. Mutations and tractions were used to relieve a majority (81%) of dystocia cases followed by cesarean section (17%) and fetotomy (2%) under field conditions. The calf mortality rate in the present study was 49.04%. The calves delivered were male in 57.96 per cent of total cases presented under field conditions.

Analysis of data of 98 buffaloes presented in different field veterinary institutions of the state indicated that 8 animals were of Murrah breed, 59 animals were graded Murrah buffaloes and 31 were of local non descript breed. Mustard oil (11%) and refined oil (11%) were used for lubrication along with linseed oil (4%), liquid paraffin (2%) and isabgol (2%). Maternal causes were the etiology behind dystocia in 41 per cent buffaloes whereas, 59 per cent of dystocias in field buffaloes were caused by fetal factors. Among maternal factors uterine torsions caused dystocia in majority (13%) of buffaloes. Twenty per cent of fetal dystocias were caused by deviations of head/neck and flexions of limbs were responsible for dystocia in 25 per cent buffaloes in the present study. Majority of the dystocias presented under field conditions were relieved by mutations (82%) followed by cesarean section (16%) whereas, fetotomy was a treatment of choice in only two cases. Fifty four (55.10%) fetuses were delivered live and 44 (44.90) were dead at delivery. Fifty nine (60.20%) calves delivered were male.

Hormonal profile of cows of dystocia and eutocia groups revealed that within dystocia group, concentration of serum cortisol declined gradually during postpartum period however, this decline was not significant. Serum estradiol-17β and progesterone levels declined gradually and significantly (p<0.01) over 0 and 24 hrs postpartum in dystocia animals. Among normally calved animals cortisol increased significantly (p<0.01) at 0 hr postpartum, however, it declined at 24 hrs postpartum. Serum levels of other two hormones viz., estradiol-17β and progesterone declined significantly (p<0.01) postpartum. Comparison of serum levels of these hormones in dystocia affected and normally calved animals revealed significantly raised cortisol levels (p<0.01) at all the three stages in dystocial animals than eutocial animals. Serum estradiol-17β levels were significantly lower (p<0.01) in dystocia affected group at prepartum and 0 hr postpartum, which attained similar values at 24 hrs in both these groups. Progesterone level of dystocia affected animals was significantly higher (p<0.01) than those calved normally, at all the three stages.

Hematological profile of dystocia affected and normally calved cows during pre and postpartum stages revealed that the hemoglobin concentration, hematocrit and RBC count in dystocia affected animals reduced significantly (p<0.05) during postpartum period. Similarly within eutocia group, hemoglobin concentration and red blood cells count declined significantly
(p<0.05) at 24 hrs postpartum in comparison to prepartum and 0 hr postpartum stages. When dystocia affected cows were compared with eutocia group cows, hemoglobin concentration and hematocrit of dystocia affected animals were significantly lower (p<0.05) than those calved normally at 24 hrs postpartum.

The leukogram of dystocia affected animals revealed a rise in WBC count during prepartum stage which declined significantly (p<0.05) at 24 hrs postpartum. Lymphocytes count declined and monocyte count increased significantly (p<0.05) at 24 hrs postpartum in these animals. Among normally calved cows, a raised white blood cell count and lymphocyte count was noticed immediately before parturition which declined significantly (p<0.05) at 24 hrs postpartum. The granulocyte count increased significantly (p<0.05) during postpartum period. The WBC count immediately postpartum and granulocyte count at prepartum stage in dystocia affected animals were significantly higher (p<0.05) than that of normally calved animals.

Plasma mineral profile of dystocia affected cows during pre and postpartum stages reflected a significant decline (p<0.05) in concentrations of zinc, cobalt and potassium at 24 hrs postpartum and of manganese at 0 and 24 hrs postpartum. The cows of normally calved group exhibited a significant decline (p<0.05) in plasma concentrations of phosphorous and manganese at 24 hrs postpartum. Comparison of mineral profile of dystocial and eutocial animals revealed a significantly higher (p<0.05) concentration of calcium at prepartum stage. Phosphorous concentrations in eutocial cows were significantly higher (p<0.05) before and immediately after delivery than dystocial ones. Sodium levels were higher during all the three stages in eutocia animals than dystocia ones Concentrations of zinc and cobalt were found to be significantly higher (p<0.05) in dystocia affected animals than those of normally calved animals at all the three stages.

Plasma biochemical profile of dystocia affected cows revealed a significant rise (p<0.05) in levels of AST during postpartum period than the levels at prepartum stage whereas, levels of BUN increased significantly (p<0.05) 24 hrs postpartum in these animals. In normally calved cows plasma AST levels which increased gradually and significantly (p<0.05) during postpartum period than the prepartum level. Plasma ALT levels increased significantly (p<0.05) from prepartum stage to immediately after delivery and later at 24 hrs postpartum. Plasma BUN levels increased significantly (p<0.05) immediately after delivery and declined at 24 hrs postpartum. Comparison of dystocia and eutocia animals revealed that the levels of plasma AST were significantly higher (p<0.05) in dystocia affected animals than normally calved animals at all the three stages whereas, plasma ALT was higher only during prepartum stage in dystocia cows. BUN was higher in dystocia animals at all the three stages. The plasma
cholesterol levels in dystocial animals were found to be significantly lower (p<0.05) than those in eutocial animals, during all the three stages in the present study.

Hormone profile of dystocia affected and normally calved buffaloes during pre and postpartum stages revealed that the cortisol levels of dystocia affected buffaloes were raised during the prepartum and 0 hr postpartum stages and a significant decline (p<0.01) was noticed after 24 hrs of delivery. There was a gradual and significant decline (p<0.01) in the values of serum estradiol-17β and progesterone in these animals during postpartum period in comparison to prepartum stage. Serum levels of cortisol and estradiol-17β in normally calved buffaloes were raised significantly (p<0.01) during prepartum stage which declined gradually during postpartum period. Serum progesterone levels also decreased during postpartum stages and the change was significant (p<0.01) at 24 hrs postpartum. The levels of cortisol in dystocia affected buffaloes were significantly higher (p<0.01) than those in normally calved buffaloes at all the three stages. Progesterone levels were significantly higher (p<0.01) in dystocial buffaloes during all the three stages whereas, the levels of estradiol-17β were significantly lower (p<0.01) in buffaloes of dystocia group at prepartum and 0 hr postpartum stage in comparison to eutocia animals.

Hemogram of dystocia affected buffaloes revealed a significant decline (p<0.05) in hemoglobin concentration and hematocrit level at 24 hrs postpartum. In normally calved buffaloes a significant decline (p<0.05) in MCV level was observed at prepartum stage. Comparison of hemogram of buffaloes in dystocia and eutocia group, revealed significantly lower (p<0.05) levels of MCHC in dystocia affected animals at all the three stages. Leukogram of dystocia affected buffaloes revealed significantly raised (p<0.05) values of white blood cells during prepartum stage whereas, the monocyte count increased significantly (p<0.05) during postpartum period in these animals. Eutocial buffaloes also exhibited a significant fall (p<0.05) in white blood cell count after delivery. Monocyte count increased significantly (p<0.05) post delivery in these animals, however, it declined after 24 hrs of delivery. Comparative analysis of leukogram of dystocia affected and normally calved buffaloes revealed significantly lower values (p<0.05) of white blood cell counts in eutocial buffaloes than dystocial ones, at all the three stages. Lymphocyte count was significantly raised (p<0.05) during postpartum period and monocyte count was higher at prepartum and 0 hr postpartum in normally calved buffaloes.

Mineral profile of dystocia affected and normally calved buffaloes during pre and postpartum stages revealed a significant decline (p<0.05) in the plasma calcium concentration immediately after delivery in dystocia affected buffaloes compared to prepartum levels. A gradual and significant fall (p<0.05) in plasma manganese concentration was recorded in these
animals during postpartum period. In normally calved buffaloes, a fall in concentrations of plasma phosphorous, magnesium and sodium was observed during postpartum period and the differences were statistically significant (p<0.05). Comparison of mineral profile of dystocia affected buffaloes with that of normally calved ones revealed significantly higher concentrations (p<0.05) of plasma calcium, zinc and cobalt at all the three stages, in the former group.

Among plasma biochemicals, AST increased significant (p<0.05) during postpartum period from prepartal stage. ALT levels in plasma of dystocia buffaloes declined significantly (p<0.05) at 24 hrs postpartum whereas, plasma BUN level increased significantly (p<0.05) during postpartum period. In the normally calved buffaloes of the present study, a significant rise in AST levels (p<0.05) was noticed at 0 and 24 hrs postpartum as compared to values before delivery. Plasma creatinine and cholesterol levels declined significantly (p<0.05) at 24 hrs postpartum in these animals. On comparison of the two groups, it was observed that dystocia affected animals had significantly higher (p<0.05) levels of plasma AST and plasma creatinine than those calved normally, during all the three stages. ALT levels were significantly higher (p<0.05) in dystocia group during prepartum and 0 hr postpartum which attained similar values as those of eutocia group at 24 hrs postpartum.

CONCLUSIONS

✓ Majority of dystocia cases were observed both in crossbred cows and graded buffaloes.
✓ No lubricant was used in majority of cases handled in field veterinary institution. However, an inclination towards usage of mustard oil as a lubricant was observed followed by refined oil and isabgol.
✓ Among maternal factors, in cattle, incomplete dilatation of cervix caused majority of dystocia in cases presented in TVCC whereas, under field conditions narrow pelvis resulted in majority of dystocia. In buffaloes uterine torsion was the major cause of dystocia in cases presented both in TVCC and under field conditions. Among fetal factors flexions of head, neck and limbs were the major cause of dystocia in both cattle and buffaloes.
✓ Serum cortisol and progesterone levels were raised in dystocia affected animals significantly whereas, estrogen levels were lower in these animals in comparison to animals with normal calving.
✓ Hemoglobin and PCV levels were reduced 24 hrs postpartum in dystocia affected animals. Leukocyte count was raised significantly in dystocia affected buffaloes at all the three stages and during postpartum stages in cattle.
✓ Levels of AST rose significantly during postpartum period both in eutocia and dystocia affected animals. Plasma AST, ALT, BUN and creatinine levels were raised in dystocia affected animals significantly than animals of eutocia group.